Dentistry                                                              Health Sciences

12-2020

# Relation of oral ulcers to quality of life: a cross-sectional study

Enji Ahmed
*The British University in Egypt*, enjy.mahmoud@bue.edu.eg

Ayat Gaml Abdelnasser
*Cairo University*

Mai Zakaria
*Cairo University*

Soheir Gafar
*Cairo University*

## Recommended Citation

Original article   168

# Relation of oral ulcers to quality of life: a cross-sectional study
Ayat G. AbdelNaser, Enji A. Mahmoud, Mai Z. Ibrahium, Soheir Gaafar

Department of Oral Medicine and Periodontology, Faculty of Dentistry, Cairo University, Cairo, Egypt

Correspondence to Ayat G. AbdelNaser, MSc, Faculty of Dentistry, Cairo University, Cairo 11562, Egypt
Tel: +20 100 187 4257;
e-mail: ayat.gamal@dentistry.cu.edu.eg

## Background
Oral ulcers affect many dental patients; impairing their lives physically, psychologically, and socially. Due to the absence of information about oral ulcers in our population, the authors undertook a pilot study to obtain a more complete picture of prevalence of oral ulcers, its probable risk factors and its burden on the quality of life.

## Materials and methods
The authors performed a cross-sectional study with 605 adult dental patients. All patients filled a questionnaire inquiring about the risk factors. An oral examination was performed to each participant to determine presence or absence of oral ulcers; and the type of the oral ulcer. Each oral ulcer patient subsequently completed an oral health impact profile-14 questionnaire.

## Results
The prevalence of oral ulcers was 10.3%; half of these were recurrent aphthous ulcers. After adjusting for the predictor variables, rural residents had higher odds for oral ulcers. The authors found that patients with erythema multiforme reported the highest impairment in quality of life; whereas patients with recurrent viral ulcers reported the lowest impairment.

## Conclusion
Patients having erythema multiforme, pemphigus vulgaris and ulcerative forms of oral lichen planus suffer from the poorest quality of life compared to patients having other types of oral ulcers. The study showed the importance of quantifying the impairment of quality of life in patients having oral ulcers to plan their treatment accordingly.

## Introduction
Oral ulcers form a category of lesions that is frequently encountered by dentists [1]. Most types of oral ulcers follow either a chronic or a recurrent course. This lifelong clinical course, together with the possible side effects of the long-term use of oral ulcer medications, affects the patient's quality of life [2].

Historically, oral lesions have been evaluated through its clinical picture only. Consequently, the best treatments were considered to be those that better improved the clinical outcome but did not necessarily provide symptom relief [3].

During the past century, oral lesions have been shifted to be evaluated through 'Patient-Reported Outcome Measures' [3], which are 'reports coming directly from the patient about how they feel or function in relation to a health condition and its therapy without interpretation by healthcare professionals or anyone else' [4].

Trials for formulating indicators to measure Patient-Reported Outcome Measures started with 'sociodental indicators'[5] in 1976 and ended by 'Oral Health-Related Quality of Life (OHRQoL)'[6] in 1997.

One of the most commonly used measures of OHRQoL is the 'Oral Health Impact Profile-14' (OHIP-14); which has proven to be a reliable method, sensitive to changes and consistent across cultures [7–9]. Thus, it has been used to evaluate the impact of different oral diseases on the patients' QoL: oral mucosal diseases [8,10,11], Behçet's disease [12], oral lichen planus (OLP) [9], leukoplakia and oral squamous cell carcinoma [13].

Regarding oral ulcer patients, their prevalence and their quality of life status have not been, to our knowledge, previously investigated in our population. Thus, we performed this pilot study to determine the prevalence of oral ulcers and quantify the disease burden in adult dental outpatients.

## Materials and methods
Between August and October 2015, we recruited a sample of 605 dental patients from the outpatient

diagnosis clinic of Faculty of Dentistry; which is an open public facility, a tertiary healthcare and a referral center.

The study protocol was registered on clinicaltrials. gov with ID NCT03167632 and was approved by the Research Ethics Committee of the Faculty of Dentistry (ID = 15-04-05). All of the study steps were performed in accordance with the Declaration of Helsinki.

The study protocol was registered on clinicaltrials.gov with ID NCT03167632.

All of the participants were at least 15 years of age. Participants were excluded if oral examination was not possible due to a severe limitation of mouth opening (due to nonoral ulcer reasons).

For each participant, the study details were explained and consent was received. Then, a comprehensive oral examination was performed on a dental unit using the light of the unit, mirror and probe to investigate the presence of any oral ulcers. If oral ulcers were detected, the patients were asked to complete an OHIP-14 questionnaire, as well as additional questions that included history of the detected ulcer, in a face-to-face interview (Appendix). For survey purposes, diagnosis was reached according to the clinical picture only using the diagnostic criteria of the WHO guide on oral mucosal diseases [14].

After oral examination and questionnaire completion, oral ulcer patients were educated about their oral problems and their ulcers were managed.

Patient information was entered in Microsoft Access database and assigned an identification number to maintain patient's confidentiality.

### Predictor variables
Patients were asked to provide their age (in 10-year intervals) [14], sex and residence status (rural or urban) [15]. They were asked to provide information regarding their history of systemic diseases which was used to rate their medical condition as 0 (no systemic disease) or 1 (one or more diseases) [11].

Additionally, they were queried about their habits regarding the use of tobacco (smoking and/or water pipe) and consumption of alcohol, Tramadol and hasheesh; each was classified as current user, former user or never consumed. For current cigarette smokers, the number of packs/day was multiplied by years of consumption to produce (pack/year) scores. Current smokers were classified into light smokers (<4.45 pack/year) and moderate to heavy smokers (≥4.45 pack/year) [15].

### Outcome variables
The primary outcome was to understand the prevalence of oral ulcers in a particular patient group. The presence of an oral ulcer was reported as a dichotomous outcome (yes/no). Diagnosis was confined to the oral ulcers that were present during examination. Therefore, recurrent ulcers were reported only if detected at the time of examination [16]. The prevalence of detected oral ulcers was reported as a proportion from all the included participants. Then, the oral ulcers prevalence was subgrouped according to the diagnosis of the detected ulcer.

The study identified two secondary outcomes, the first of which was effect of risk factors on having oral ulcers. The prevalence was adjusted for the main predictors: patient's sex, age, smoking, residence and, medical history.

The study further investigated a second secondary outcome, namely the OHRQoL of the oral ulcer patients. This was measured using the OHIP-14 questionnaire. It measures the seven dimensions of OHRQoL, namely: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap [7].

Each of these seven dimensions was assessed using two questions. The response for each question was recorded using a five-point Likert scale with 0 = never, 1 = hardly ever, 2 = occasionally, 3 = fairly often, and 4 = very often. Within each dimension, the response was multiplied by preset weights to calculate each subscore. The seven subscores were then added to produce the OHRQoL score of each participant. Then, the overall OHRQoL scores and subscores for each type of oral ulcers were calculated. Higher scores are interpreted as poorer levels of OHRQoL (in other words, higher impairment).

### Bias
Participants who refused to participate were asked about the cause of their refusal and received an explanation of their value to the study to reduce nonrespondent bias. Participants refusing to continue the questionnaire were reported along with the reasons for their refusal. These incomplete records were excluded from the statistical analysis. To reduce selection bias, participants were included in the study according to the consecutive sequence of entry to the clinic.

### Statistical analysis
Statistical Package for the Social Sciences (SPSS) for Microsoft Windows version 16.0, (SPSS Inc., Chicago, Illinois, USA) was used for statistical analysis of the data. All tests were two-sided and $P$ less than or equal to 0.05 was considered to indicate statistical significance.

Descriptive analysis, absolute and relative frequency distributions were performed for all of the variables. Mean values with standard deviations were reported for continuous variables. A Kruskal–Wallis test was used for comparison of the OHRQoL information of the different types of oral ulcers.

The following input was added in a web-based sample size calculator (*http://www.surveysystem.com/index.htm*): the daily flow of patients in the outpatient clinic, which was in the range of 550–950 patients/day, the previously surveyed prevalence of oral ulcers of 4% [17], the desired confidence level of 95% and a confidence interval of 4. The sample size was calculated to include 600 patients, and we increased this by five more patients to compensate for any nonrespondents or incomplete records.

## Results

### Participants
We initially recruited 605 adult participants into the study; however, two participants showed inconvenience when asked about hasheesh and Tramadol. They refused to participate due to doubts about the confidentiality of their records.

Another participant was unable to complete the questionnaire due to an urgent need to leave in the middle of the interview for personal reasons. After excluding these records, the final number of participants in our study was 602 (Fig. 1).

### Descriptive data
The age of the participants ranged from 15 to 75 years, with a mean age of 30.13 years (±10.41). Table 1

summarizes the baseline data of the participants. Most (77.6%) of the participants indicated that they did not use tobacco, alcohol, Tramadol or hasheesh.

### Outcome data

*Prevalence of oral ulcers*
Of the 602 participants in our study, 62 had oral ulcers. The detected oral ulcers range between reactive ulcers, recurrent aphthous ulcers, recurrent viral ulcers, pemphigus vulgaris (PV), erythema multiforme (EM), ulcerative form of OLP and oral cancer. The prevalence of oral ulcers in our sample was therefore 10.3% (95% confidence intervalCI = 7.87–12.73%), and half of the participants had recurrent aphthous stomatitis (RAS). Reactive ulcers (including traumatic ulcers, thermal burns, and chemotherapy-induced oral mucositis) were the second most prevalent type (16.1%) (Table 2).

**Figure 1**
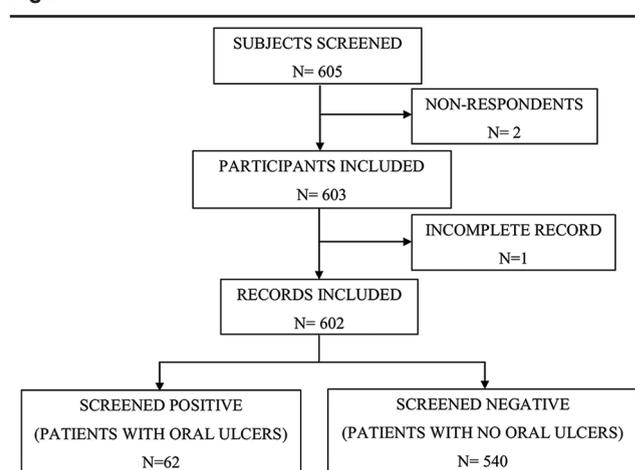


The final number of participants in the study

**Table 1 Baseline demographic and clinical data of the study participants (original work)**

|  | Ulcer-free participants [n (%)] | Patients with oral ulcers [n (%)] | Total |
|---|---|---|---|
| Age |  |  |  |
| 15-19 | 68 (11.3) | 5 (0.8) | 73 (12.1) |
| 20-29 | 123 (20.4) | 17 (2.8) | 140 (23.3) |
| 30-39 | 159 (26.4) | 19 (3.2) | 178 (29.6) |
| 40-49 | 99 (16.6) | 4 (0.7) | 103 (17.1) |
| 50-59 | 61 (10.2) | 8 (1.3) | 69 (11.5) |
| 60-69 | 26 (4.3) | 7 (1.2) | 33 (5.5) |
| ≥70 | 4 (0.7) | 2 (0.3) | 6 (0.9) |
| Sex |  |  |  |
| Male | 189 (31.4) | 23 (3.8) | 212 (35.2) |
| Female | 351 (58.3) | 39 (6.5) | 390 (64.8) |
| Residence |  |  |  |
| Urban | 399 (66.3) | 36 (6) | 435 (72.3) |
| Rural | 141 (23.4) | 26 (4.3) | 167 (27.7) |
| Medical history |  |  |  |
| Free | 382 (63.5) | 31 (5.2) | 413 (68.6) |
| ≥1 medical condition | 158 (26.2) | 31 (5.2) | 189 (31.4) |

*Risk factors of oral ulcers*

Logistic regression model was used to estimate the effect of different predictors on the participants' chances of having oral ulcers. Analysis was done to estimate odds ratios adjusted for: age, sex, medical history, residence, and smoking.

After adjusting for these variables, the confidence interval of the effect of smoking crossed the point of no difference on the odds of having oral ulcers. In contrast, patients with positive medical history, higher age groups and females proved to have lower odds for oral ulcers. On the other hand, rural residents had higher odds for oral ulcers (Table 3).

*Oral Health-related Quality of Life*

The OHRQoL of oral ulcer patients was assessed by the seven parameters of OHIP-14 questionnaire. Table 4 shows the significant differences between the parameters of OHIP-14 for all detected oral ulcer types; except for the handicap parameter which did not differ significantly in different types of oral ulcers.

Among the types of oral ulcers detected, patients with EM reported the highest OHIP-14 scores, suggesting that they suffered from the poorest levels of quality of life. EM scores were followed by scores of PV then erosive type of OLP. Patients with recurrent viral ulcers had the lowest OHIP-14 scores, suggesting that their quality of life was the least impaired as compared to other oral ulcers detected. EM patients reported the highest impairment of functional limitation, handicap and psychological and social disability, whereas PV patients reported the highest levels of physical pain, physical disability, and psychological discomfort.

## Discussion

Oral ulceration represents a common distressing lesion [1]. In our study, we investigated the prevalence of oral ulcers in adult dental patients in a hospital-based setting. The study was held in a center that is considered one of the main tertiary healthcare dental centers. Thus, it was chosen to be the center of this pilot study so that the results would be representative of the most commonly occurring oral ulcers in adult dental patients. Two other comparable studies have been conducted in hospital-based setting: one was conducted in Jordan [18], which investigated the prevalence of oral ulcers; and one conducted in India [1], which investigated only benign types of oral ulcers.

The prevalence of oral ulcers in our study was 10.3%, much lower than that reported by the Jordanian (41.08%)[18] and the Indian (44.5%) studies [1]. Younger age groups in both studies proved high prevalence of RAS and traumatic ulcers. Our lower prevalence may be explained by differences in study design, as both of the earlier studies included participants of all age groups, whereas ours included adults only.

However, our reported prevalence of oral ulcers (10.3%) is higher than other reported values: 0.05% [19], 4% [20], 4.2% [15], and 6.6% [21]. This was to be expected as our study was conducted at a referral center, in which misdiagnosed or undiagnosed patients seek diagnosis and treatment, whereas the previously mentioned values were from population-based studies.

This study found that RAS constituted 50% of the detected ulcers similar to the values reported in the Jordanian (55.7%)[18] and Indian (47.4%)[1] studies. However, the prevalence of RAS in our study was two times higher than that previously reported by an American study [20], a discrepancy that can be justified by the population-based design of the American study [20].

Reactive ulcers were the second highest group of ulcers detected, with prevalence (14.5%) of the detected ulcers, consistent with that reported by the Jordanian study (11.07%) [18], however, it was much lower than the value reported in the Indian study (31.4%) [1], which was observed to be due to high number of denture-caused traumatic ulcers.

In our study, the most serious type of oral ulcers (oral cancer) constituted 3.2% of the detected ulcers, a prevalence value that was higher than the 0.33% value reported by the Jordanian study [18]. We could not compare our results on oral cancer prevalence to those of the Indian study [1], as their study reported only benign ulcers.

**Table 2 The prevalence of each type of oral ulcers, their sample prevalence (percentage out of all the study participants) and their lesion frequency (percentage among detected oral ulcers) (original work)**

|  | RAS | Reactive | Recurrent viral | OLP | EM | PV | Oral cancer | Total |
|---|---|---|---|---|---|---|---|---|
| Number of patients | 31 | 10 | 6 | 6 | 4 | 3 | 2 | 62 |
| Sample prevalence (%) | 5.1 | 1.7 | 1 | 1 | 0.7 | 0.5 | 0.3 | 10.3 |
| Lesion frequency (%) | 50 | 16.1 | 9.7 | 9.7 | 6.5 | 4.8 | 3.2 | 100 |

EM, erythema multiforme; OLP, oral lichen planus (ulcerative type); PV, pemphigus vulgaris; RAS, recurrent aphthous stomatitis.

Generally, the discrepancy between the results of all studies, including ours, may be attributed to differences in the study populations [15], the study designs (cross-sectional and retrospective) and the study settings [22].

Regarding the risk factors, we found that higher age groups had lower odds of having oral ulcers. Previous studies investigating the effect of age as a risk factor for oral ulcers revealed that some ulcers decrease with age such as RAS; while others decrease with it such as OLP and traumatic ulcers [23]. As half of our oral ulcer patients had RAS, our results proved lower odds with increasing age.

We reported that females had lower odds of oral ulcers. Previous studies showed sex had an insignificant effect on the odds of having oral lesions [10,15,23,24]. Other studies negated the presence of a significant effect of sex on ulcerated lesions; while verifying its effect on non-ulcerated lesions [15].

Lower odds were also attributed to having one or more systemic diseases. On the contrary, a previous study proved oral mucosal lesions to be associated with previous medications [24]. Our results may be attributed to the high percentage of RAS that occurs in young medically uncompromised patients.

In contrast, higher odds were attributed to rural residence. A previous study[15] proved insignificant effect of residence on oral ulcers. Due to their limited access to healthcare services, the under-privileged patients are more prone to delaying their diagnosis and treatment [15].

The insignificant effect of smoking on oral ulcers was consistent with the previous studies investigating oral mucosal[24] and ulcerated lesions [15]. Other studies reported lower prevalence of RAS and OLP with active tobacco exposure [23]; while in other types of oral mucosal lesions, it proved to cause higher prevalence [20,23].

With regard to the secondary outcome of the study, which was the patients' quality of life, OHIP-14 questionnaire has been frequently used to investigate the OHRQoL for a certain type of oral lesions. However, only Llewellyn and Warnakulasuriya [10], Suliman et al. [11], and Tabolli et al.[8] investigated a wide range of oral lesions. But no studies were found to compare between the OHRQoL of all types of oral ulcer patients.

Llewellyn and Warnakulasuriya[10] investigated the OHRQoL of dental patients having oral lesions. Oral ulcers were assessed as an entity without specifying the types of the detected ulcers or the impairment in each type; therefore we are unable to compare our results to theirs.

Similarly, Suliman et al.[11] investigated the OHRQoL in relation to the number of oral lesions. Because the authors did not specify the type of the oral lesions detected and stated only the number of detected lesions per patient, we were unable to compare their results to ours either.

Therefore, the only available study for which results can be compared to ours is that by Tabolli et al. [8], which investigated the OHRQoL of dermatology patients with different oral mucosal diseases. This study, which was conducted on Italian patients, categorized the oral lesions detected as: RAS, nonmalignant lesions,

**Table 3 Logistic regression analysis estimating odds ratios adjusted for predictor variables (original work)**

| Predictors | Odds ratio | 95% CI | | P |
|---|---|---|---|---|
| | | Lower | Upper | |
| Medical history** | 0.355 | 0.21 | 0.601 | <0.001* |
| Residence† | 1.750 | 1.001 | 3.06 | 0.05* |
| Smoking‡ | 1.379 | 0.693 | 2.741 | 0.36 |
| Age§ | 0.2 | 0.117 | 0.347 | <0.001* |
| Sex˩ | 0.479 | 0.25 | 0.917 | 0.026* |

*Level of significance at $P \leq 0.05$. CI, confidence interval. Predictor variables were coded as follow: **medical history: 0=none, 1=one or more disease. †Residence: urban residence=1, rural residence=2. ‡Smoking: nonsmoker=0, light smoker=1, moderate to heavy smoker=2, former smoker=3. §Age: 15-19 years=1, 20-29 years=2, 30-39 years=3, 40-49 years=4, 50-59 years=5, 60-69 years=6 and ≥70 years=7. ˩Sex: male=1, female=2.

**Table 4 The OHRQoL of each detected type of oral ulcers assessed with the seven parameters of OHIP-14 (original work)**

| | Reactive (n=10) | EM (n=4) | RAS (n=31) | Viral (n=6) | OLP (n=6) | PV (n=3) | Cancer (n=2) | P** |
|---|---|---|---|---|---|---|---|---|
| Functional limitation | 1.16 (1.21) | 3.26 (1.19) | 0.88 (0.93) | 0.42 (0.59) | 1.33 (1.03) | 2.5 (1.31) | 0.98 (1.39) | 0.029* |
| Physical pain | 2.44 (1.14) | 3.92 (0.17) | 2.65 (1.01) | 0.95 (0.98) | 3.34 (0.59) | 4 (0) | 2.36 (1.41) | <0.001* |
| Psychological discomfort | 1.81 (1.61) | 3.45 (1.1) | 2.01 (1.18) | 0.78 (0.89) | 2.68 (1.48) | 3.63 (0.64) | 2.28 (0.39) | 0.013* |
| Physical disability | 2.44 (1.57) | 3.52 (0.96) | 2.01 (1.29) | 0.81 (0.96) | 3.16 (1.37) | 3.84 (0.28) | 0.72 (1.02) | 0.003* |
| Psychological disability | 1.68 (1.57) | 3.55 (0.9) | 1.8 (1.36) | 0.13 (0.33) | 2.4 (0.66) | 3.33 (0.12) | 0.9 (1.27) | 0.001* |
| Social disability | 1.86 (1.59) | 3.6 (0.81) | 1.37 (1.22) | 0.31 (0.52) | 2.48 (1.09) | 1.84 (2.02) | 1 (1.4) | 0.013* |
| Handicap | 1.84 (0.76) | 2.48 (1.16) | 1.25 (0.88) | 0.59 (0.75) | 1.57 (0.72) | 1.57 (1.363) | 1.77 (0.834) | 0.066 |
| OHIP-14 | 13.23 (6.61) | 23.76 (6.04) | 11.97 (5.74) | 4 (4.112) | 16.96 (2.37) | 20.7 (3.57) | 9.99 (1.61) | <0.001* |

All scores are reported as mean (SD). OHIP-14, Oral Health Impact Profile-14; OHRQoL, Oral Health-Related Quality of Life. *$P \leq 0.05$. **Tested with a Kruskal-Wallis test.

burning mouth syndrome, bacterial and fungal diseases, changes in morphology and color of the tongue, OLP and others. The 'others' group included rare diseases, such as pemphigus.

In our study, EM patients showed the highest impairment of OHRQoL followed by pemphigus, OLP, reactive ulcers, RAS, oral cancer and finally, recurrent viral ulcers. However, in the study by Tabolli *et al.* [8], RAS patients reported the highest impairment in QoL as compared to other oral mucosal diseases.

The difference between our results and those of the Tabolli *et al.*[8] can be attributed to the unclear categorization of lesions in the Italian study. First, EM was not stated to be among the included cases; it is unclear if it was included in the 'nonmalignant lesions' category. Also, pemphigus was included together with granulomatous diseases in the 'others' category, therefore, its impact could not be assessed separately. With regard to OLP, Tabolli *et al.*[8] included all of its types, whereas in our study, we only included the ulcerative type. When the impact of both symptomatic and asymptomatic OLP was assessed in one group, a lesser impact on QoL was reported by Tabolli *et al.* [8]. Only the RAS group was well-defined.

In our study, the high impairment in OHRQoL reported by EM patients can be explained by considering the subscores of the OHIP-14 questionnaire. EM proved the highest impact on functional limitation, handicap, psychological, and social disability. This was expected due to its clinical behavior which manifests by acute, disseminated intraoral ulceration.

PV may be occupying the second place in OHRQoL impairment due to its more chronic behavior which suggests that the patient must cope with its symptoms over time. The lesser impact on social and psychological disabilities could also be attributed to the higher age group affected by this disease in comparison to that affected by EM. The older individuals are expected to pay less attention to their social image.

Lastly, the recurrent behavior may explain why recurrent herpetic ulcers occupy the last place in OHRQoL impairment among detected oral ulcers. Patients were assumed to cope well with the continuously recurring ulcers to an extent that some patients reported zero impact on their OHRQoL.

As a cross-sectional study, an inherent limitation in the study design is that the predictors and outcomes are only proven to be associated with each other at a point in time without proving which caused the other [20]. This applies to risk factors and oral ulcers, and to oral ulcers and OHRQoL.

The study suggests the routine use of the quality of life questionnaires in clinical practice in order to ensure personalized high quality management of each patient.

### Conflicts of interest
There are no conflicts of interest.

## References
1. Patil S, Doni B, Wadhawan R, Maheshwari S, Santosh BS, Khandelwal S. Prevalence of benign oral ulcerations in the Indian population. J Craniomaxillary Dis 2014; 3:26–31.
2. Riordain RN, Hodgson T. Content and quality of website information on the treatment of oral ulcers. Br Dent J 2014; 217:E15–E15.
3. Locker D. Concepts of oral health, disease and the quality of life. In: Slade GD, editor. *Measuring Oral Health and Quality of Life*. Chapel Hill, North Carolina, USA: University of North Carolina, Dental Ecology; 1997. pp. 12–23.
4. Patrick D, Guyatt G, Acquadro C. Chapter 17: patient reported outcomes. In: Higgins J, Green S, editor. In: *Cochrane Handbook for Systematic Reviews of Interventions. Version 5.0.1*. The Cochrane Collabo; 2011.
5. Cohen LK, Jago JD. Toward the formulation of sociodental indicators. Int J Health Serv 1976; 6:681–698.
6. Slade GD. *Measuring Oral Health and Quality of Life. Dental Ecology*. Chapel Hill, CA: University of North Carolina; 1997. pp. 1–11.
7. Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol 1997; 25:284–290.
8. Tabolli S, Bergamo F, Alessandroni L, Di Pietro C, Sampogna F, Abeni D. Quality of life and psychological problems of patients with oral mucosal disease in dermatological practice. Dermatology 2009; 218:314–320.
9. López-Jornet P, Camacho-Alonso F. Quality of life in patients with oral lichen planus. J Eval Clin Pract 2010; 16:111–113.
10. Llewellyn CD, Warnakulasuriya S. The impact of stomatological disease on oral health-related quality of life. Eur J Oral Sci 2003; 111:297–304.
11. Suliman NM, Johannessen AC, Ali RW, Salman H, Åstrøm AN. Influence of oral mucosal lesions and oral symptoms on oral health related quality of life in dermatological patients: a cross sectional study in Sudan. BMC Oral Health 2012; 12:1–11.
12. Mumcu G, Niazi S, Stewart J, Hagi-Pavli E, Gokani B, Seoudi N, *et al.* Oral health and related quality of life status in patients from UK and Turkey: a comparative study in Behcet's disease. J Oral Pathol Med 2009; 38:406–409.
13. Karbach J, Al-Nawas B, Moergel M, Daubländer M. Oral health-related quality of life of patients with oral lichen planus, oral leukoplakia, or oral squamous cell carcinoma. J Oral Maxillofac Surg 2014; 72:1517–1522.
14. Kramer IR, Pindborg JJ, Bezroukov V, Infirri JS. Guide to epidemiology

and diagnosis of oral mucosal diseases and conditions. World Health Organization. Community Dent Oral Epidemiol 1980; 8:1–26.

15. Do LG, Spencer AJ, Dost F, Farah CS. Oral mucosal lesions: findings from the Australian National Survey of Adult Oral Health. Aust Dent J 2014; 59:114–120.

16. Scully C, Felix D. Oral medicine – update for the dental practitioner – Aphthous and other common ulcers. Br Dent J 2005; 199:259–264.

17. Paleri V, Staines K, Sloan P, Douglas A, Wilson J. Evaluation of oral ulceration in primary care. BMJ 2010; 340:1234–1239.

18. Muhaidat ZH, Rodan RE. Prevalence of oral ulceration among jordanian people. Pak Oral Dent J 2013; 33:42–49.

19. Knapp MJ. Oral disease in 181,338 consecutive oral examinations. J Am Dent Assoc 1971; 83:1288–1293.

20. Shulman JD, Beach MM, Rivera-hidalgo F. The prevalence of oral mucosal lesions in U.S. adults. Data from the third national health and nutrition examination survey, 1988-1994. J Am Dent Assoc 2004; 135:1279–1286.

21. Cebeci ARI, Gülşahi A, Kamburoglu K, Orhan BK, Oztaş B. Prevalence and distribution of oral mucosal lesions in an adult Turkish population. Med Oral Patol Oral Cir Bucal 2009; 14:E272–E277.

22. Martinez A, Garc'a-Pola M. Epidemiological study of oral mucosal pathology in patients of the Oviedo School of Stomatology. Med Oral 2002; 7:4–16.

23. Pentenero M, Broccoletti R, Carbone M, Conrotto D, Gandolfo S. The prevalence of oral mucosal lesions in adults from the Turin area. Oral Dis 2008; 14:356–366.

24. Espinoza I, Rojas R, Aranda W, Gamonal J. Prevalence of oral mucosal lesions in elderly people in Santiago, Chile. J Oral Pathol Med 2003; 32:571–575.

# Appendix

**Date of presentation: ..........................**            **ID number:……………………**

- Name:_____

- Phone number:_____

- Age (years):_____  ☐ 15-19    ☐ 20-29    ☐ 30-39

  ☐ 40-49    ☐ 50-59    ☐ 60-69    ☐ 70+

  --------------------------------------------------------------------------------------

- Sex:        ☐ male    ☐ female

  ----------------------------------------------------------------------------------------

- Education* :  ☐ illiterate   ☐ primary   ☐ secondary

  ☐ University    ☐ higher studies

  ----------------------------------------------------------------------------------------

  Address**:   ☐ Urban        ☐ rural

  ----------------------------------------------------------------------------------------

- Occupation: ☐ farmer  ☐ worker  ☐ desk job  ☐ healthcare

  ☐ Others  ☐ none

---

\*  Suliman, N.M., Johannessen, A.C., Ali, R.W., Salman, H., Åstrøm, A.N.: Influence of oral mucosal lesions and oral symptoms on oral health related quality of life in dermatological patients: a cross sectional study in Sudan. BMC Oral Health. 12, 19 (2012).

\*\*  Do, L.G., Spencer, a. J., Dost, F., Farah, C.S.: Oral mucosal lesions: Findings from the Australian National Survey of Adult Oral Health. Aust. Dent. J. 59, 114–120 (2014).

## II. Medical History:

Chronic Systemic Diseases:

☐ Hypertension ☐ Diabetes (type 2) ☐ Diabetes type 1

☐ Cardiovascular diseases ☐ Respiratory diseases

☐ Gastroenteric diseases ☐ Psychiatric/mental disorders

☐ Autoimmune diseases ☐ Hepatitis

☐ Endocrinopathy ☐ Neoplastic diseases

☐ Allergy

☐ Pregnancy

☐ Birth control method

☐ Others:

_____

_____

_____

_____

☐ Medically uncompromised

*2*

## III. Personal History:

- Smoking cigarettes *

Current

Light (<4.5 pack.year) ☐    Moderate to Heavy (>4.5 pack.year) ☐    former ☐    none ☐

- Sheesha (Hookah)

current ☐    former ☐    none ☐

- Alcohol Consumption

Beer ☐    Alcohol ☐    None ☐

- Tramadol

current ☐    former ☐    None ☐

- Tobacco chewing

current ☐    former ☐    None ☐

- Hasheesh

current ☐    former ☐    None ☐

- Others (specify)

- Lip/ Cheek biting

YES ☐    NO ☐

---

**Reference:**

*  Do, L.G., Spencer, a. J., Dost, F., Farah, C.S.: Oral mucosal lesions: Findings from the Australian National Survey of Adult Oral Health. Aust. Dent. J. 59, 114–120 (2014).

*  For current cigarette smoking, the number of packs/day has been multiplied by years of exposure to produce (pack.year) score.

## III- History of the lesion:*

Any detectable ulcer ☐ Yes ☐ No

### If yes:

1. Onset: ☐ sudden ☐ insiduous ☐ gradual
2. Initial appearance: ☐ Ulcer ☐ Vesicle ☐ nodule
3. Prodromal phenomenon: ☐ Itching ☐ fever ☐ lymphadenopathy
   ☐ None
4. Duration of this episode: ☐ <3 weeks ☐ > 3 weeks
5. Episodic ☐ yes ☐ No

   If Yes,

6. duration of each episode: ☐ days ☐ weeks ☐ months
7. duration between episodes: ☐ none ☐ days ☐ weeks
   ☐ Months ☐ years
8. Duration from appearance at first time:
   ☐ weeks ☐ months ☐ years
9. associated with: ☐ trauma ☐ menstruation ☐ stress
   ☐ Seasonal ☐ food or drugs ☐ None
10. halitosis: ☐ yes ☐ no
11. Bleeding: ☐ yes ☐ no

---

**Reference:**

\*    Reade, P.C.: Oral ulcers. Aust. Dent. J. 358–362 (1961).

*4*

12.Regarding the Ulcers: **(OHIP-14 for measuring Oral Health Related QoL)\***

| | | 0 never | 1 Hardly ever | 2 Occasi onally | 3 Fairly often | 4 Very often |
|---|---|---|---|---|---|---|
| Functional limitation | a) Have you had any troubles pronouncing any word because of problems with your mouth**? | | | | | |
| | b) Have you felt that your sense of taste has worsened because of problems with your mouth? | | | | | |
| Physical pain | c) Have you had painful aching of your mouth? | | | | | |
| | d) Have you found it uncomfortable to eat any foods because of problems with your mouth? | | | | | |
| Psychologica l discomfort | e) Have you been self-conscious because of your mouth? | | | | | |
| | f) Have you felt tense because of problems with your mouth? | | | | | |
| Physical disability | g) Has your diet been unsatisfactory because of problems with your mouth? | | | | | |
| | h) Have you had to interrupt meals because of problems with your mouth? | | | | | |
| Psychologica l disability | i) Have you found it difficult to relax because of problems with your mouth? | | | | | |
| | j) Have you been a bit embarrassed because of problems with your mouth? | | | | | |
| Social disability | k) Have you been a bit irritable with other people because of problems with your mouth? | | | | | |
| | l) Have you had difficulty doing your usual jobs because of problems with your mouth? | | | | | |
| Handicap | m) Have you felt that life in general was less satisfying because of problems with your mouth? | | | | | |
| | n) Have you been totally unable to function because of problems with your mouth? | | | | | |

\* Slade, G.D.: Derivation and validation of a short-form oral health impact profile. Community Dent. Oral Epidemiol. 25, 284–290 (1997).

** "Problems with your mouth" in this study refers to the oral ulcer/s

5

## IV- Examination of the lesion:*
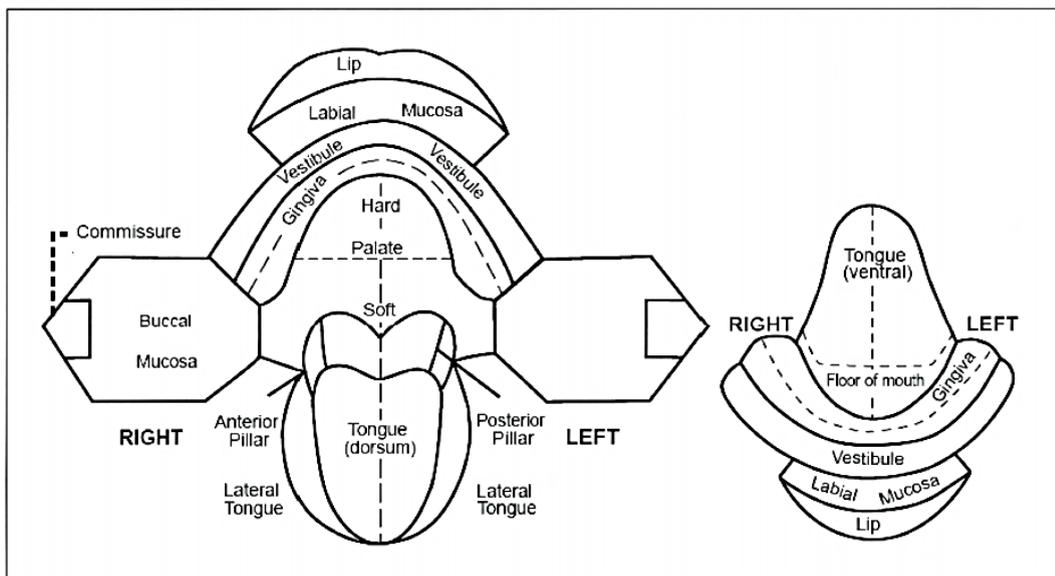


1. Site: ☐ right buccal mucosa ☐ left buccal mucosa

   ☐ Upper labial mucosa ☐ lower labial mucosa

   ☐ Upper vermilion border ☐ lower vermilion border

   ☐ Dorsal tongue surface ☐ ventral tongue surface

   ☐ Right Lateral tongue surface ☐ left Lateral tongue surface

   ☐ Mucosa of Hard palate ☐ mucosa of soft palate

   ☐ Gingiva of upper teeth ☐ gingiva of lower teeth

   ☐ Vestibular mucosa ☐ floor of the mouth

2. Size: ☐ $0.5cm^2$   ☐ $<1cm^2$   ☐ $1-5\ cm^2$   ☐ $>5cm^2$

3. Shape: ☐ round   ☐ oval   ☐ irregular

4. Distribution: _____

5. Number: ☐ solitary   ☐ multiple

6. Depth: ☐ superficial   ☐ deep

7. Edge: ☐ non-specific   ☐ raised & everted   ☐ punched out

*6*

☐ Undermined

8. Floor: _____

9. Margin ☐ edema   ☐ Erythema   ☐ white margin   ☐ white striae

☐ None

10. Base: ☐ Indurated   ☐ freely moving

11. Regional lymphadenopathy: _____

☐ Palpable   ☐ not palpable

☐ Tender   ☐ not tender

☐ Movable   ☐ fixed

☐ Soft   ☐ firm   ☐ rubbery

12. Associated lesions: ☐ nasal mucosa   ☐ ocular lesions   ☐ genital

☐ Arms   ☐ legs   ☐ back   ☐ trunk

☐ Face   ☐ scalp   ☐ nails   ☐ None

☐ Others, Specify_____

13. Other Remarks: _____

_____

_____

_____

---

\* Reade, P.C.: Oral ulcers. Aust. Dent. J. 358–362 (1961).

## V- Diagnosis:*

**Acute:** ☐ ANUG   ☐ chemotherapy   ☐ radiotherapy

☐ Herpangina   ☐ AHGS   ☐ hand, foot and mouth

☐ Erythema Multiforme   ☐ Allergy


**Multiple, recurrent:** ☐ herpes labialis   ☐ recurrent intraoral herpes

☐ Minor Aphthous ulcer   ☐ Major Aphthous ulcer

☐ Aphthous-like


**Chronic:** ☐ Allergy   ☐ pemphigus vulgaris   ☐ bullous pemphigoid

☐ Mucous membrane pemphigoid   ☐ Lichen planus

☐ Lupus erythematosus   ☐ epidermolysis Bullosa


**Solitary:** ☐ aphthous   ☐ traumatic   ☐ Tuberculosis

☐ Deep fungal   ☐ chancre   ☐ gamma

☐ Necrotizing sialometaplasia   ☐ squamous cell carcinoma


---

\*   Schneider, L.C., Schneider, a E.: Diagnosis of oral ulcers. Mt. Sinai J. Med. 65, 383–387 (1998).

*8*