

## An Insight into the Psyche of Patients with Oral Sub Mucous Fibrosis: A Cross Secional Study of 580 Cases

**Received:** 22 October 2022, **Revised:** 18 November 2022, **Accepted:** 24 December 2022

**1Dr. Hitesh Vadera, 2Dr. Deval Mehta, 3Dr. Ramita Sood, 4Divya Jain**

1PhD scholar, Gujarat University, Ahmedabad, Gujarat, India

2Dean and Head of Department, Oral and Maxillofacial Surgery, Bopal Dental College, Ahmedabad, Gujarat, India

3Head of Department, Oral and Maxillofacial Surgery, AMC Dental College, Khokhra, Ahmedabad, Gujarat, India

4AMC Dental College, Khokhra, Ahmedabad, Gujarat, India

**Corresponding author: Dr. Hitesh Vadera**

PhD scholar, Gujarat University, Ahmedabad, Gujarat, India

Email: drhiteshvadera@gmail.com

### Abstract:

580 diagnosed cases of OSMF were classified into various grades using a standardised classification system and evaluated for depression, stress and anxiety using the DASS 42 questionnaire. Patients with grade 1 OSMF were found to be undergoing mild depression, mild anxiety and severe stress. The interpretation for grade 4 OSMF patients showed that they were suffering from severe depression, extremely severe anxiety and moderate stress. All these 3 psychological conditions, if present together have a hazardous impact on the systemic health of the individual and therefore the treatment of OSMF should consist of psychological and / or psychiatric intervention as well.

### 1. Introduction

It is believed that approximately 14% of the global burden of disease has been attributed to neuropsychiatric disorders, mostly due to the chronically disabling nature of depression and other common mental disorders, alcohol-use and substance-use disorders, and psychoses.(Prince M et al. 2007).

Physical and mental health are more closely linked than the general population can imagine. On careful observation of the effect of mental health problems, the biologic basis of increased physical health problems due to mental disorders is due to the increases release of cortisol which leads to immunosuppression, thereby making us more prone to various diseases and vice versa. Thus this becomes a vicious cycle which must be broken by a collaborated team work of health care professionals, counselors and therapists.

In low and middle income countries, especially in third world countries like India, mental health is not considered as primary care due to lack of training, supervision, mental barriers and decentralization of resources.(Saraceno et al 2007.)

According to World Health Organization (WHO), 350 million lives are lost due to depression and is ranked 9th amongst mortal diseases like heart disease, stroke and HIV. (Smith, K. *Mental Health: A World of Depression.*(2014) *Nature* 515, P180-181, n.d.). Therefore, it is essential to understand the mental status of an individual suffering from a chronic medical condition.

Oral submucous fibrosis (OSMF) is a premalignant condition with a multifactorial aetiopathogenesis where areca nut has proven to be the main causative agent along with synergistic effects caused by chewing of smokeless tobacco, high intake of chilies, toxic levels of copper in foodstuffs and masticatories, vitamin deficiencies, and malnutrition resulting in low levels of serum proteins, anemia and genetic predisposition.(Rao, N. R. et al 2020)

Worldwide, the number of cases of OSMF was estimated to be 2.5 million in 1996. Although many case finding studies have been conducted, particularly in South and South East Asia, OSMF is not a notifiable disease and no population-based data are available(Cox, S. C., & Walker, D. M. 1996). The prevalence of OSMF in India has been estimated to range from 0.2-2.3% in males and 1.2-4.6% in

# Journal of Coastal Life Medicine

females, with a broad age range from 11 to 60 years (More, C. B., & Rao, N. R. 2019). A marked increase in incidence has been observed after the widespread marketing of commercial tobacco and areca nut products, generally known as Gutkha, which is sold in single-use packets (Gupta PC, Warnakulasuriya S. 2002). Currently, it is estimated that areca nut is consumed by 10–20% of the World's population in a wide variety of formulations. The global South Asian diaspora also has a significant problem with cases reported from the United Kingdom, USA, South Africa, and many European countries. (More, C. B., Rao, N. R., More, S., & Johnson, N. W. (2020). Srinivasan M, Jewell SD. 2001)

The associated clinical signs and symptoms of OSMF as stated clearly (Thakur, N., & Kumar, V. 2014) can lead to a poor quality of life thereby leading to prevalence of psychological diseases in these type of cases. It can be characterized by a disruption of emotions leading to depression (Sekhon, S., & Gupta, V. (Updated 2022, May 8) Anxiety disorders often are an abnormal or exaggerated version of arousal. In animals and humans, the so-called —fight-or-flight response is referred to as the acute stress response to any abnormal circumstances. (Barbee, J. G. (1998)

Keeping these psychological disorders in mind we decided to use the Depression anxiety stress scale (DASS-42) (Lovibond, S.H., Lovibond, P.F. (1995) comprising of 42 questions to evaluate these 3 psychological disorders in patients with OSMF.

## 2. Materials and Methods

The prospective study was conducted in the Department of Oral Maxillofacial Surgery at AMC Dental College and Hospital, Khokhara, Ahmedabad, Gujarat from 2020-2023 where 580 cases with OSMF were chosen by a randomized pattern and classified into various grades using the system proposed by Chadramani More in 2012. (More C, Gupta S, Joshi J, Varma S. 2012)

Patients with good general health, evident signs and symptoms of OSMF and those consenting to participate in the study irrespective of age, sex, caste, religion and socioeconomic status were included in the study. Patients with clinically visible carcinomatous changes on intra oral examination,

reduced mouth opening due to any other condition other than OSMF or those who have been previously medically or surgically treated for OSMF were excluded from the study. Patients with systemic comorbidities, previous history of psychiatric disorders, on anti psychotic medicines and those who refused to quit the habit and unwilling for follow up were also excluded from the study.

## QUESTIONNAIRE

- A case history proforma will be used to collect all data of the subject especially details regarding the history of the habit, his medical history, occupation and other clinical findings essential for diagnosis of both OSMF and psychosocial disorder.
- All patients will sign a consent given to them in a language best understood by them prior to their participation in the study.
- DASS-42 Questionnaire will be handed to all cases with OSMF to assess the mental health of each individual and to check for the severity and status of depression, anxiety and stress in the same.
- The data collected will then be evaluated as per the scoring methods given in DASS and results will be recorded for interpretation and inferences.

On clinical examination, an interincisal distance of 30mm was considered normal and less than that was considered restricted. This was measured by placement of the vernier caliper on maxillary and mandibular right/left central incisors. A thorough evaluation of the oral cavity was performed to check for blanching and fibrous bands where a thick, vertical, continuous band like structure felt in the buccal mucosa - to be considered as a fibrous band and the presence of other pre malignant conditions like leukoplakia will also be observed and recorded.

The DASS-42 interpretation sheet was used to obtain the maximum and minimum scores obtained by each patient in the depression, anxiety and stress sections.

Mean values of all demographic and descriptive data was obtained using the universal methods of determining mean, median and mode.

To assess the significance of differences between pairs of group means, a post hoc tukey test was used.

# Journal of Coastal Life Medicine

## DASS 42 SCORE SHEET

Enter each score from the questionnaire into the first two columns.  
 Add up each row and enter the score into the available box (D, A or S)  
 Add up the each of the D, A and S columns.  
 The total for each column is the score for that trait:  
 D = Depression  
 A = Anxiety  
 S = Stress  
 Use the ratings table below to assess the meaning of each score.

### Score Calculation:

Q	Score	Q	Score	All D scores	All A scores	All S scores
1	22					
2	23					
3	24					
4	25					
5	26					
6	27					
7	28					
8	29					
9	30					
10	31					
11	32					
12	33					
13	34					
14	35					
15	36					
16	37					
17	38					
18	39					
19	40					
20	41					
21	42					
				Total for D	Total for A	Total for S

### Score Interpretation:

	Depression (D)	Anxiety (A)	Stress (S)
Normal	0 - 9	0 - 7	0 - 14
Mild	10 - 13	8 - 9	15 - 18
Moderate	14 - 20	10 - 14	19 - 25
Severe	21 - 27	15 - 19	26 - 33
Extremely Severe	28+	20+	34 +
Recommendation	5-Hydroxytryptophan Complex	Herbal Support for Hyper HPA	Ginkgo/Bacopa Complex

### 3. Results and Discussion

Murugan, S. M. in 2021 assessed 96 cases of OSMF in the year 2019-2020 in Chennai and determined that male predilection (91.7%) was far more than female predilection. (Murugan, S. M. 2021)

In our study of 578 cases, 96.2% cases were males while 3.8% were females. The observations stated in both the articles align with those of our study. This could be because females maintain better oral hygiene and are more domesticated in India than men. Therefore they have less access to substance abuse of

# Journal of Coastal Life Medicine

various types which can lead to these pre malignant conditions.

Ramsey, M. W., Jr, Chen-Sankey, J. C., Reese-Smith, J., & Choi, K. In 2019 attempted to understand the use of cigarette smoking and marital status in America where they included 11889 participants of various ethnicities. They recorded the marital statuses as married, cohabiting, divorced, widowed, separated, single/never married. Adults who had the highest prevalence of cigarette smoking were non-Hispanic Black cohabitators (36.2%), separated non-Hispanic White adults (35.3%), and single/never married Hispanic adults (28.2%). It is noteworthy that widowed adults had lower cigarette smoking prevalence than those who were divorced or separated across races/ethnicities. (Ramsey, M. W et al 2019.)

In our study, all subjects were known cases of OSMF of which 91% were married whereas 7% were unmarried, 0.5% were widowed and 1.5% were divorced.. Also the results of the study conducted in 2019 does not shows a higher prevalence of tobacco consumption among married individuals. Marriages in India are conducted at an early age hence more of our participants were married . All had a positive history of substance abuse hence they suffered from OSMF. On the other hand, no article to the best of our knowledge has attempted to record any correlation between marital status and OSMF.

Tariq, H., Ahmed, S., Naz, M., & Naureen, A. in 2020 diagnosed 135 cases with OSMF in a tertiary care hospital in Karachi out of which 47.7% having no formal education. 43.2% were skilled workers followed by 34.8% housewives and 22% were professionals. (Tariq, H. et al 2020) In our study, , the majority subjects included 67.8% as workers followed by professional(7.7%) housewives (7.4%), semi professionals(7.1%). The results obtained in our study show significantly more number of workers with OSMF as compared to the other study. This proves that the disease is more prevalent in the unaware and lower socio economic sectors of the society.

Angadi, P., & Krishnapillai, R. in 2010 studied 205 cases of OSMF in Dharwad and found that 47.8% of the cases belonged to the age group of 21-30 years. (Angadi, P. V., & Rekha, K. P. (2010) In our study, the mean age of the study population was found to be 44.27+/-11.83 years. The reasons for the difference

between the age groups could be due to the late age of initiation of the habit lack of awareness of the adverse effects of substance abuse and delayed diagnosis due to minor changes in the oral mucosa which often go unnoticed by the subject.

Aishwarya KM, Reddy MP, Kulkarni S, Doshi D, Reddy BS, Satyanarayana D. in 2017 conducted a cross section study on 280 tobacco consumers, out of which 50 patients were considered as chewable tobacco consumers and 50 were control. Out of these 16% had been chewing tobacco for more than 30 years and the rest had been consuming for less than three decades. (Aishwarya, K. M. et al 2017) In our study, mean duration of habit was 12.83+/-8.35 years.

Ansari ZA, Bano SN, Zulkifle M. in 2010 recorded the prevalence of the use of tobacco in 500 power loom workers and stated the mean amount of tobacco consumed in chewable form was 5 quids or pouches a day (Ansari, Z. A., Bano, S. N., & Zulkifle, M. 2010, January.) In our study, the mean consumption of tobacco was 5.22+/-4.16 times a day.

The duration and frequency of consumption are essential it proves that the more the intake and frequency of daily consumption, the more the chances of development of pre malignant conditions like OSMF.

Hosein, M., Mohiuddin, S., & Fatima, N in 2015 chose a sample size of 765 patients and found that Mild OSMF was seen in 61 cases (8.0%), moderate OSMF in 353 (46.1%) and severe OSMF in 417 (54.5%) subjects (Hosein, M., Mohiuddin, S., & Fatima, N. 2015). In our study, a sample size of 580 patients was chosen where 85 (14.6%) cases had grade 1 OSMF, 112 (19.3%) had grade 2, 285 (49.1%) had grade 3, and 98 (16.89%) cases had grade 4 OSMF.

Kanodia, S., Giri, V. P., Giri, O. P., Devi, M. P., & Garima, Y in 2017 chose a sample size of 105 patients of which 35 cases were diagnosed with OSMF. They used the Hamilton Depression Rating Scale (HAM-D) questionnaire where a total score of 0-7 indicates normal, 8-13 mild depression, 14-18 moderate depression, 19-22 severe depression, and  $\geq 23$  very severe depression. Mild, moderate, severe, and very severe depression were observed in 17 (16.20%), 1 (0.95%), 1 (0.95%), and 1 (0.95%) in cases of OSMF. The limitations of this study were that the grades of

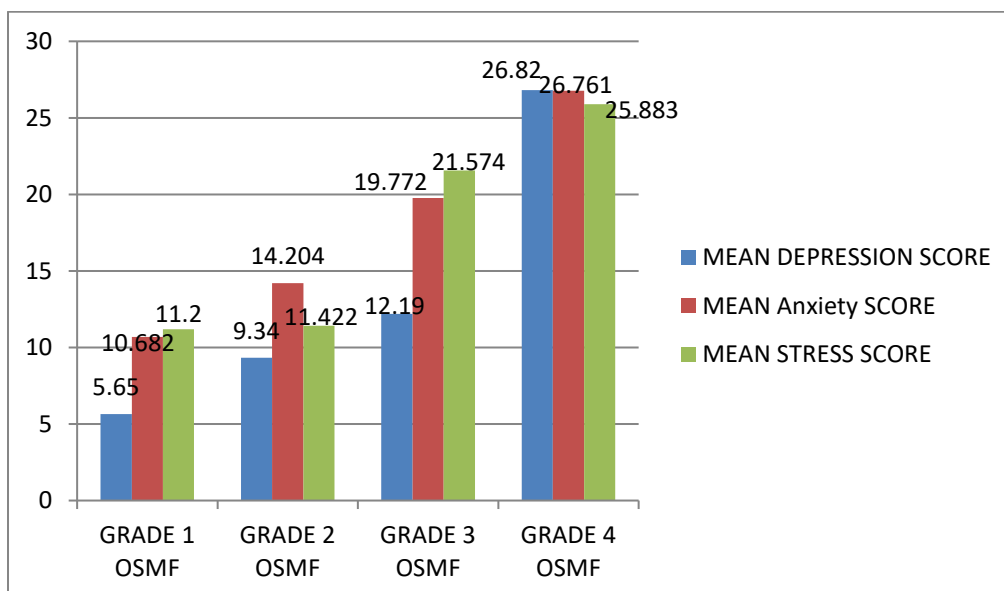
# Journal of Coastal Life Medicine

the cases with OSMF were not recorded. Due to this, no correlation could be established between the progression of the disease and the depression simultaneously (Kanodia, S. et al 2017). Our study had a larger sample size and we have tried our best to overcome the above mentioned limitations of the study using the DASS-42 questionnaire. A mean score of 26.82 for depression was seen in subjects with in grade 4 OSMF which indicated severe depression as per DASS-42 scoring sheet, while those with grade 3 OSMF had mild depression. On multiple inter group comparisons between all grades of OSMF, it was observed that as the grade of OSMF became more severe, the state of depression in the individual also showed severity.

The same study done by Kanodia, S., Giri, V. P., Giri, O. P., Devi, M. P., & Garima, Y in 2017 performed Hamilton Anxiety Rating Scale (HAM-A) questionnaire to record the anxiety levels in individuals, where a total score of <17 indicates mild anxiety, 18–24 mild-to-moderate anxiety, and 25–30 moderate-to-severe anxiety. Mild anxiety was observed in 29 (27.62%) and moderate in 6 (5.72%) cases of OSMF. None had severe anxiety. The

limitations for anxiety were the same as depression. (Kanodia, S. et al 2017) In our study, we used the DASS-42 questionnaire and based on the scores obtained, extremely severe anxiety was present in grade 4 OSMF (>26) whereas in grade 3 OSMF it was of severe category (19) followed by moderate category of anxiety in grade 3, 2 and grade 1 groups of OSMF. Statistically significant values were obtained which proved that increased grading of OSMF leads to higher levels of anxiety.

Saalim, M., Sansare, K., Karjodkar, F. R., Ali, I. K., Sharma, S. R., Kapoor, R., Mehra, A., & Rahman, B. in 2022 evaluated stress levels in 90 diagnosed cases of OSMF using the Psychological General Well Being Index short version and determined that stress was present due to depressed mood, lack of positive well being, low vitality, anxiety, low vitality, and low self-control were associated with OSMF. (Saalim et al., 2022) The limitation for this study were also that the details regarding the relation of stress to various grades of OSMF was not taken into consideration. In our study, the mean score for stress was highest in grade 4 OSMF was 25.883 while minimum was for grade 1 OSMF i.e. 11.200.



Various studies related to depression stress and anxiety in chronic debilitating disease have been mentioned mostly related to carcinomas which are considered as diseases more morbid as compared to OSMF. (Xie, H. et al 2015) (Yuan, L et al 2020.) Since man is a social animal this can further lead to depression, anxiety due to lack of social interactions

and stress due to the increasing loneliness in an individual. Therefore, we have tried to understand the effect of OSMF on socio-psychological aspects of the person's life.

**No article to the best of our knowledge has noted the following observations in OSMF:**

# Journal of Coastal Life Medicine

- Comparison of grading of OSMF to the scores obtained in depression, anxiety and stress.
- Use of a single questionnaire to determine 3 types of mental health disorders for OSMF.
- Inter group comparison of grades of OSMF and mean scores of depression, anxiety and stress to show a direct relation of mental and systemic disease progression.
- Large and diverse sample size focusing on a single chronic disease and its effect on psychological health in a single state of India.

## 4. Conclusion

Thus, on the basis of our observations, we can arrange DASS-42 scores in the following order:

### FOR DEPRESSION SCORE:

GRADE 4 OSMF > GRADE 3 > GRADE 2 > GRADE 1

### FOR ANXIETY SCORE:

GRADE 4 OSMF > GRADE 3 > GRADE 2 > GRADE 1

### FOR STRESS SCORE:

GRADE 4 OSMF > GRADE 3 > GRADE 2 > GRADE 1

## References

- [1] Aishwarya, K. M., Reddy, M. P., Kulkarni, S., Doshi, D., Reddy, B. S., & Satyanarayana, D. (2017, August 27). Effect of frequency and duration of tobacco use on oral mucosal lesions – A cross-sectional study among tobacco users in Hyderabad, India. *Asian Pacific Journal of Cancer Prevention: APJCP*, 18(8), 2233–2238. <https://doi.org/10.22034/APJCP.2017.18.8.2233>. (n.d.).
- [2] Angadi, P. V., & Rekha, K. P. (2010). Oral submucous fibrosis: A clinicopathologic review of 205 cases in Indians. *Oral and Maxillofacial Surgery*, 15(1), 15–19. [Doi:10.1007/s10006-010-0225-x](https://doi.org/10.1007/s10006-010-0225-x). (n.d.).
- [3] Ansari, Z. A., Bano, S. N., & Zulkifle, M. (2010, January). Prevalence of tobacco use among power loom workers – A cross-sectional study. *Indian Journal of Community Medicine*, 35(1), 34–39. <https://doi.org/10.4103/0970-0218.62551>. (n.d.).
- [4] Barbee, J. G. (1998). Mixed symptoms and syndromes of anxiety and depression: Diagnostic, prognostic, and etiologic issues. *Annals of Clinical Psychiatry*, 10(1), 15–29. (n.d.).
- [5] Cox, S. C., & Walker, D. M. (1996). Oral submucous fibrosis. A review. *Australian Dental Journal*, 41(5), 294–299. <https://doi.org/10.1111/j.1834-7819.1996.tb03136.x>. (n.d.).
- [6] Gupta PC, Warnakulasuriya S. (2002) Global epidemiology of areca nut usage. *Addict Biol*;7(1):77–83. (n.d.).
- [7] Hosein, M., Mohiuddin, S., & Fatima, N. (2015). Association Between Grading of Oral Submucous Fibrosis With Frequency and Consumption of Areca Nut and Its Derivatives in a Wide Age Group: A Multi-centric Cross Sectional Study From Karachi, Pakistan. *Journal of cancer prevention*, 20(3), 216–222. <https://doi.org/10.15430/JCP.2015.20.3.216>. (n.d.).
- [8] Kanodia, S., Giri, V. P., Giri, O. P., Devi, M. P., & Garima, Y. (2017). Assessment of anxiety, depression, and serum cortisol level in oral submucous fibrosis patients: A controlled clinical trial. *European journal of dentistry*, 11(3), 293–298. [https://doi.org/10.4103/ejd.ejd\\_9\\_17](https://doi.org/10.4103/ejd.ejd_9_17). (n.d.).
- [9] Lovibond, S.H., Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd ed.). Sydney: Psychology Foundation. (n.d.).
- [10] More, C. B., & Rao, N. R. (2019). Proposed clinical definition for oral submucous fibrosis. *Journal of Oral Biology and Craniofacial Res.earch*, 9(4), 311–314. <https://doi.org/10.1016/j.jobcr.2019.06.016>. (n.d.).
- [11] More, C. B., Rao, N. R., More, S., & Johnson, N. W. (2020). Reasons for initiation of areca nut and related products in patients with oral submucous fibrosis within an endemic area in Gujarat, India. *Substance Use and Misuse*, 55(9), 1413–1421. <https://doi.org/10.1080/10826084.2019.1660678>. (n.d.).
- [12] More C, Gupta S, Joshi J, Varma S. (2012) Classification system of Oral submucous fibrosis. *J Indian Acad Oral Med Radiol*,24(1), 24–9. (n.d.).
- [13] More, C., Peter, R., Nishma, G., Chen, Y., & Rao, N. (2018). Association of Candida species with Oral submucous fibrosis and Oral leukoplakia: A

# Journal of Coastal Life Medicine

- case control study. *Annals of Clinical and Laboratory Research*; 06(3):, 248. <https://doi.org/10.21767/2386-5180.100248>. (n.d.).
- [14] More C, Shilu K, Gavli N, Rao NR. (2018) Etiopathogenesis and clinical manifestations of oral submucous fibrosis, a potentially malignant disorder: An update. *Int J Curr Res*;10(07):71816–20. (n.d.).
- [15] Murugan, S. M. (2021). Assessment of incidence of oral submucous fibrosis patients – An institutional study. *International Journal of Dentistry and Oral Science*, 1939–1945. <https://doi.org/10.19070/2377-8075-21000384>. (n.d.).
- [16] Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, et al. (2007) No health without mental health. *Lancet*. 370,p859–77. (n.d.).
- [17] Ramsey, M. W., Jr, Chen-Sankey, J. C., Reese-Smith, J., & Choi, K. (2019). Association between marital status and cigarette smoking: Variation by race and ethnicity. *Preventive medicine*, 119, 48–51. <https://doi.org/10.1016/j.ypmed.2018.12.010>. (n.d.).
- [18] Rao, N. R., Villa, A., More, C. B., Jayasinghe, R. D., Kerr, A. R., & Johnson, N. W.. (2020). Oral submucous fibrosis: AA contemporary narrative review with a proposed inter-professional approach for an early diagnosis and clinical management. *Journal of Otolaryngology – Head and Neck Surgery*; December;, 49(1);, 3. <https://doi.org/10.1186/s40463-020-0399-7>. (n.d.).
- [19] Saalim, M., Sansare, K., Karjodkar, F. R., Ali, I. K., Sharma, S. R., Kapoor, R., Mehra, A., & Rahman, B. (2022). Oral submucous fibrosis and its impact on psychological stress: A case-control study. *Psychology, Health & Medicine*, 27(4), 735–745. <https://doi.org/10.1080/13548506.2020.1826545>
- [20] Saraceno B, van Ommeren M, Batniji R, Cohen A, Gureje O, Mahoney J, et al. (2007) Barriers to improvement of mental health services in low-income and middle-income countries. *Lancet*. 370, p1164–74. (n.d.).
- [21] Sekhon, S., & Gupta, V. (updated 2022, May 8). Mood Disorders. In: StatPearls [Internet]. (2022, January)-. Available from. <https://www.ncbi.nlm.nih.gov/books/NBK558911/>. StatPearls Publishing. (n.d.).
- [22] Smith, K. Mental health: A world of depression.(2014) *Nature* 515, p180–181. (n.d.).
- [23] Srinivasan M, Jewell SD.(2001) Evaluation of TGF-alpha and EGFR expression in oral leukoplakia and oral submucous fibrosis by quantitative immunohistochemistry. *Oncol*;61(4):284–92. (n.d.).
- [24] Tariq, H., Ahmed, S., Naz, M., & Naureen, A. (2020). Frequency of oral sub mucous fibrosis and its correlation with the level of education in patients coming to a tertiary care hospital of Karachi from January 2018 to December 2018. *Asian Pacific Journal of Cancer Care*, 5(3), 157–160. <https://doi.org/10.31557/apjcc.2020.5.3.157-160>. (n.d.).
- [25] Thakur, N., & Kumar, V. (2014). An outline of existing clinical classification system for oral submucous fibrosis. *Research Advances Dent*, 3(2), 72–75. (n.d.).
- [26] Xie, H., Li, C., He, Y., Griffin, R., Ye, Q., & Li, L. (2015). Chronic stress promotes oral cancer growth and angiogenesis with increased circulating catecholamine and glucocorticoid levels in a mouse model. *Oral oncology*, 51(11), 991–997. <https://doi.org/10.1016/j.oraloncology.2015.08.007>. (n.d.).
- [27] Yuan, L., Pan, B., Wang, W., Wang, L., Zhang, X., & Gao, Y. (2020). Prevalence and predictors of anxiety and depressive symptoms among patients diagnosed with oral cancer in China: A cross-sectional study. *BMC Psychiatry*, 20(1), 394. <https://doi.org/10.1186/s12888-020-02796-6>. (n.d.).