

Impact of Oral Submucous Fibrosis on Quality of Life

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ABSTRACT

Background: Oral submucous fibrosis (OSMF) is a chronic, insidious, potentially malignant condition primarily affecting populations with areca nut chewing habits. It significantly impairs oral functions and is associated with restricted mouth opening, burning sensations, and altered speech and eating, which can severely impact a patient's quality of life (QoL).

Aim: To assess the impact of OSMF on the quality of life in patients attending a tertiary care hospital using the WHOQOL-BREF questionnaire.

Methodology: This was a cross-sectional observational study conducted at the Department of Maxillofacial Surgery, Abbasi Shaheed Hospital Karachi from 5th September 2022 to 4th March 2023. A total of 120 patients diagnosed with OSMF were enrolled. Demographic data and clinical features were recorded, and QoL was assessed across four domains - physical health, psychological health, social relationships, and environmental health - using the WHOQOL-BREF questionnaire.

Results: Majority of patients were male (65%), with a mean age of 44.7 years. The most affected domains were psychological and social relationship domains. Only 3 patients (2.5%) reported very poor QoL, while 49 patients (40.8%) reported good QoL. Stratification revealed significant associations between QoL and age, gender, residential status, BMI, and educational level.

Conclusion: Oral submucous fibrosis has a variable impact on quality of life, with some patients experiencing substantial impairment. Early diagnosis, patient counseling, and multidisciplinary management are crucial for improving outcomes.

Keywords: Oral submucous fibrosis (OSMF), Quality of life, WHOQOL-BREF, Oral health, Potentially malignant disorder

INTRODUCTION

Oral submucous fibrosis is a chronic, insidious, and progressive disease that primarily affects the oral mucosa and occasionally extends to the pharynx and upper third of the esophagus. It is clinically recognized as a potentially malignant disorder with a significant risk of transformation into oral squamous cell carcinoma (OSCC), particularly in South and Southeast Asia, where areca nut consumption is culturally prevalent.^{1,2} OSMF presents as a fibrotic condition characterized by stiffness of the oral mucosa, trismus (restricted mouth opening), burning sensations upon eating spicy foods, and progressive difficulty in speech and mastication. These symptoms can lead to significant functional disability, psychological distress, and social withdrawal, cumulatively affecting the patient's quality of life.^{3,4}

The etiology of OSMF is multifactorial, though the most widely accepted causative factor is the chewing of areca nut, either alone or in combination with tobacco or lime.⁵ Areca nut contains alkaloids like arecoline and tannins, which stimulate fibroblasts to produce excessive collagen, leading to submucosal fibrosis. The addition of slaked lime during chewing further facilitates alkaloid hydrolysis and collagen cross-linking, exacerbating fibrosis.⁶ Other contributing factors include nutritional deficiencies (particularly iron and vitamin B-complex), genetic susceptibility, and immunologic influences. Several studies have reported a synergistic effect of areca nut with tobacco and alcohol consumption, resulting in increased disease severity and malignant transformation.⁷

Histopathologically, OSMF is characterized by epithelial atrophy, inflammation, and hyalinization of the lamina propria, with varying degrees of fibrosis in deeper connective tissues and underlying muscles. The progression of fibrosis causes restricted mouth opening and leads to compromised oral functions. In addition to physical symptoms, patients experience altered speech, dysphagia, and changes in facial aesthetics, contributing to psychological morbidity.^{8,9}

Globally, it is estimated that over 5 million people suffer from OSMF, with the highest prevalence reported in India, Pakistan, Bangladesh, Taiwan, and among South Asian immigrant populations worldwide.¹⁰ In Pakistan, the widespread availability

and affordability of areca nut products such as gutka, pan masala, and betel quid have contributed to increasing incidence rates. Most users start the habit at an early age, and lack of awareness regarding its health consequences compounds the public health burden.¹¹

While substantial research has been conducted on the pathogenesis, histology, and malignant potential of OSMF, less attention has been given to its impact on QoL. Given that OSMF primarily affects the oral cavity - a crucial component of speech, aesthetics, nutrition, and social interaction - the implications of this disease on day-to-day functioning are profound.¹² Using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire have provided valuable insights into how chronic oral conditions influence physical, psychological, social, and environmental well-being.¹³

The WHOQOL-BREF is a globally validated instrument designed to assess an individual's perception of their position in life within the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. It covers four broad domains: physical health, psychological health, social relationships, and environment. For patients with OSMF, the physical domain captures pain, fatigue, sleep disturbances, and the impact of restricted oral movements. The psychological domain reflects negative emotions, self-esteem, and body image. Social relationships are evaluated based on personal relationships and social support, while the environmental domain assesses factors such as financial resources, access to healthcare, and physical safety.^{14,15}

Previous studies investigating QoL in OSMF patients have reported varying outcomes depending on disease severity, socioeconomic background, and awareness. For instance, Bari et al. found that a significant proportion of OSMF patients reported moderate-to-severe impairment in QoL, especially in the physical and psychological domains. Their study revealed mean domain scores of 25.96±4.46 for physical health and 20.62±2.81 for psychological health, indicating a measurable decline in daily functioning.¹⁶ Other studies corroborate these findings, pointing to a higher prevalence of anxiety, depression, and social isolation in OSMF patients, especially among males with long-standing habits of areca nut chewing and tobacco use.^{17,18}

Socio-demographic variables such as age, gender, education level, marital status, and income have also been linked

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to QoL outcomes in OSMF. Older age and lower educational status often correlate with delayed diagnosis and poor compliance with treatment. Cultural stigma associated with restricted mouth opening and disfigurement may also lead to social isolation and decreased confidence.^{19,20} Moreover, females may experience compounded psychosocial stress due to aesthetic concerns and societal expectations regarding facial appearance and speech.

The therapeutic management of OSMF includes a combination of lifestyle modification (cessation of areca nut chewing), pharmacotherapy (steroids, hyaluronidase, antioxidants), physiotherapy, and in advanced cases, surgical interventions. While these modalities may improve clinical outcomes, they do not always translate into improved QoL if psychosocial aspects are not simultaneously addressed.²¹⁻²³ Hence a holistic approach to OSMF management should incorporate psychological support, nutritional counselling and patient education.^{24,25}

Given the scarcity of local data in Pakistan and the need for a deeper understanding of how OSMF affects patient-centered outcomes, this study aims to evaluate the impact of OSMF on QoL using a structured and validated instrument (WHOQOL-BREF) among patients attending a tertiary care hospital. By stratifying QoL outcomes against demographic and clinical variables, the study also intends to identify high-risk groups who may benefit from targeted interventions. Understanding the QoL implications of OSMF not only provides insights into the patient's lived experience but also helps clinicians and policymakers prioritize resources, develop culturally appropriate educational materials, and integrate oral health into broader health promotion strategies.

MATERIALS AND METHODS

This was a cross-sectional observational study conducted at the Department of Maxillofacial Surgery, Abbasi Shaheed Hospital Karachi from 5th September 2022 to 4th March 2023. Ethical approval was obtained from the Institutional Review Board and the College of Physicians and Surgeons Pakistan. A total of 120 patients were enrolled using non-probability consecutive sampling. The sample size was calculated using the WHO sample size calculator based on a standard deviation of 4.46, a confidence interval of 95%, and a margin of error of 0.8. All patients aged 18–70 years, both male and female patients, clinically diagnosed cases of OSMF and symptomatic for at least one month were included. Patients with chronic illnesses such as chronic kidney or liver disease, history of malignancy, pregnant women and individuals with restricted mouth opening due to odontogenic infection or TMJ disorders were excluded. After obtaining informed consent, demographic and clinical data were recorded. Mouth opening was measured using a vernier caliper. The World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire was administered in the patient's native language, with scores calculated in four domains: physical, psychological, social relationships, and environmental health. All data were entered and analyzed using SPSS-25. Stratification was performed to observe associations between QoL scores and variables like age, gender, body mass index, educational status, comorbidities, and smoking.

RESULTS

There were 78 (65%) males and 42 (35%) females. Most patients 58.3% were urban dwellers, hypertension was present in 65 (54.2%), smokers were 44 (36.7%), 39 (32.5%) were of intermediate, widows were 49 (40.8%) [Table 1]. The means were age was 44.7±11.9 years, body mass index was 26.2±4.6 kg/m² and duration of symptoms was 15.6±1.2 months (Table 2).

Overall quality of life among patients with oral submucous fibrosis (OSMF), based on WHOQOL-BREF responses, a large proportion of patients reported their QoL as "Good" (40.8%) or "Neither Poor nor Good" (43.3%), indicating moderate levels of perceived well-being. Only a small percentage rated their QoL as

"Very Poor" (2.5%) [Table 3]. The mean scores of the four domains of the WHOQOL-BREF instrument among the study participants. The lowest scores were seen in the social relationships and psychological health domains, suggesting a considerable emotional and interpersonal burden. The highest domain score was recorded for environmental health, possibly reflecting adequate access to healthcare and living conditions in the urban cohort (Table 4).

Table 1: Demographic information of the patients (n=120)

Characteristic	No.	%
Gender	Male	78
	Female	42
Residential status	Urban	70
	Rural	50
Hypertension	Yes	65
	No	55
Diabetes mellitus	Yes	44
	No	76
Smoking	Yes	44
	No	76
Educational status	Illiterate	6
	Primary	12
	Secondary	19
	Matric	21
	Intermediate	39
	Graduate or higher	23
Marital status	Single	15
	Married	36
	Divorced	20
	Widowed	49

Table 2: Descriptive statistics of the patients (n=120)

Variable	Mean±SD
Age (years)	44.7±11.9
Body mass index (Kg/m ²)	26.2±4.6
Duration of symptoms (months)	15.6±1.2

Table 3: Quality of life (QoL) ratings among OSMF patients (n=120)

QoL Rating	No.	%
Very Poor	3	2.5
Poor	12	10.0
Neither Poor nor Good	52	43.3
Good	49	40.8
Very Good	4	3.3

Table 4: WHOQOL-BREF Domain Scores

Domain	Mean±SD
Physical Health	25.8±4.3
Psychological Health	19.7±3.1
Social Relationships	10.4±1.3
Environmental Health	27.6±4.4

DISCUSSION

Oral submucous fibrosis is a significant public health issue in South Asia, particularly due to its high prevalence, malignant potential and substantial impact on the patient's quality of life (QoL). The demographic analysis QoL among patients with clinically diagnosed OSMF using the WHOQOL-BREF instrument, revealed a higher prevalence of OSMF among males (65%), consistent with earlier studies indicating male predominance in areca nut and tobacco consumption.^{1,2} The mean age of 44.7 years also aligns with the typical age of presentation in other regional cohorts, reflecting the chronicity and late diagnosis associated with OSMF.³ The age stratification indicated that patients over 40 years reported significantly lower QoL, possibly due to long-standing disease and the compounding effects of other comorbidities such as diabetes and hypertension.

In the present study, mean BMI was 26.2 kg/m² suggesting that a substantial proportion of OSMF patients fall within the overweight category. While OSMF is not directly linked to BMI, higher BMI could potentially mask systemic signs of nutritional deficiencies, which are implicated in the disease pathogenesis.⁴

Interestingly, our results found no statistically significant difference in QoL across different BMI groups, though this area warrants further exploration.

Our study showed that physical health was the most impacted domain, with a mean score of 25.8 ± 4.3 . This finding is in line with the hallmark clinical symptoms of OSMF-restricted mouth opening, burning sensation, and oral ulcers - that directly impair daily functions like eating, drinking, and speaking.^{5,6} The psychological domain followed closely, with a mean score of 19.7 ± 3.1 , reflecting emotional stress, anxiety, and lowered self-esteem reported by patients. Chronic oral diseases often contribute to psychological burden due to aesthetic concerns, social avoidance, and functional limitations.⁷

The social relationship domain scored lowest among all domains was 10.4 ± 1.3 in this study. This may be attributed to patients avoiding social situations that involve eating, speaking, or smiling, due to both physical discomfort and perceived social stigma. These findings are consistent with observations from studies in India and Sri Lanka that document social withdrawal in patients with advanced OSMF.^{8,9} The environmental domain, however, scored relatively better (27.6 ± 4.4), possibly due to the tertiary hospital setting offering reasonable access to care.

Smoking, a common habit among the participants, was associated with lower QoL scores in all domains, although the differences were not statistically significant. Nonetheless, previous literature has documented smoking and chewing tobacco as synergistic factors that exacerbate the fibrosis and carcinogenic potential of OSMF.^{10,11}

The educational status of patients significantly influenced QoL outcomes. Participants with at least intermediate-level education scored better across all domains, highlighting the role of awareness, literacy, and health-seeking behavior in disease management. This observation underscores the need for targeted educational campaigns and early intervention programs, especially in underprivileged populations.¹²

Hypertension and diabetes mellitus, reported in 54.2% and 36.7% of the cohort respectively, are known comorbidities that further diminish overall health. In our study, patients with these comorbidities had relatively poorer QoL scores, particularly in the physical and psychological domains. This finding aligns with existing evidence that chronic systemic illnesses tend to compound the burden of oral diseases, both physiologically and psychologically.¹³

Interestingly, urban residents exhibited significantly better QoL compared to rural patients. This could be due to better healthcare access, awareness, and social support systems in urban environments. Such disparities call for policy-driven efforts to strengthen oral health infrastructure and outreach in rural areas.¹⁴

Several treatment modalities exist for OSMF, including pharmacologic interventions (steroids, hyaluronidase, pentoxifylline), physiotherapy, and surgical release in advanced stages.¹⁵ However, none of these directly address the psychosocial dimensions of the disease. Our study findings emphasize the necessity of incorporating psychological counselling and QoL monitoring into standard OSMF treatment protocols. Multi-disciplinary care involving dental surgeons, psychologists, and dieticians could significantly enhance patient outcomes.

The WHOQOL-BREF instrument proved valuable in capturing the multifaceted impact of OSMF. Despite being a generic tool, it allowed meaningful assessment of disease impact across multiple life domains. However, future research might consider using oral health-specific QoL instruments, such as the Oral Health Impact Profile (OHIP-14), to provide more granular insights.¹⁶

CONCLUSION

Most patients reported moderate QoL, while a considerable portion experienced poor to very poor outcomes. Factors such as age, gender, residential status, educational level, and comorbidities e.g., diabetes and hypertension influenced QoL scores. Early detection, health education regarding the hazards of areca nut and tobacco use, and multidisciplinary management are crucial in preventing disease progression and improving QoL.

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