



Quality of Life-related “Patient-reported Outcome Measures” in Oral Submucous Fibrosis Patients

¹Shailesh M Gondivkar, ²Rahul R Bhowate, ³Amol R Gadball, ⁴Sachin C Sarode, ⁵Rima S Gondivkar
⁶Monal Yuwanati, ⁷Shankargouda Patil

ABSTRACT

Aim: The aim of this study was to explore the patients' perspectives about the impact of oral submucous fibrosis (OSF) on life quality.

Materials and methods: Thirty clinically diagnosed OSF patients with a wide degree of disease severity and diverse range of sociodemographic profile were included in this study. Fourteen participants were interviewed and four focus group discussions were conducted in nonclinical settings. The audio recordings were anonymized, transcribed, and translated in English from Marathi language. Data were analyzed using an in-depth narrative thematic analysis method.

Results: Four main themes evolved from the interviews: (1) discomfort and functional impairment; (2) psychological wellness; (3) physical wellness, and (4) social wellness. Majority of the participants discussed about discomfort and functional impairment. Participants also reported greater impact of OSF on psychological and social wellness.

Conclusion: This study demonstrated the impact of OSF on different aspects of participant's life. “Discomfort and functional impairment” was noticed to be the most recognized theme by our participants. However, OSF also has impacts on other important domains, namely psychological, social, and physical wellness.

Clinical significance: The patient-reported outcome (PRO) measure (PROM) reflects an integral aspect of general health and well-being and thus can be used to elucidate the impact of OSF on the quality of life (QoL) of affected individuals. These patients' perspectives should be taken into consideration along with thorough clinical examination to decide and effectively manage the overall health care needs of the OSF patients.

Keywords: Oral health, Oral submucous fibrosis, Patient-reported outcome measures, Quality of life.

How to cite this article: Gondivkar SM, Bhowate RR, Gadball AR, Sarode SC, Gondivkar RS, Yuwanati M, Patil S. Quality of Life-related “Patient-reported Outcome Measures” in Oral Submucous Fibrosis Patients. *J Contemp Dent Pract* 2018;19(3):331-338.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Oral submucous fibrosis is an oral potentially malignant disorder¹ characterized by burning sensation in the oral cavity, oral ulceration, vesiculation, blanching, and stiffening of the oral mucosa and oropharynx, consequently leading to gradual limitation of mouth opening. Shevale et al² reported increasing number of OSF cases every year, affecting 5 million people in India alone (0.5% of the Indian population). Another study conducted by Hazarey et al³ in the central part of India recorded 21.9 OSF cases per 1,000 individuals with male predominance at the ratio of 4.9:1. Several factors contribute to this increasing prevalence of OSF, especially in India, including addiction of youth population to this socially acceptable and

¹Department of Oral Medicine and Radiology, Government Dental College & Hospital, Nagpur, Maharashtra, India

²Department of Oral Medicine and Radiology, Sharad Pawar Dental College & Hospital, Wardha, Maharashtra, India

³Department of Dentistry, Indira Gandhi Government Medical College & Hospital, Nagpur, Maharashtra, India

⁴Department of Oral Pathology and Microbiology, Dr. D. Y. Patil Dental College & Hospital, Dr. D. Y. Patil Vidyapeeth, Pune Maharashtra, India

⁵Private Practitioner, Mahalakshmi Nagar, Nagpur, Maharashtra India

⁶Department of Oral Pathology and Microbiology, People's College of Dental Sciences and Research Centre, Bhopal, Madhya Pradesh, India

⁷Division of Oral Pathology, Department of Maxillofacial Surgery and Diagnostic Sciences, College of Dentistry, Jazan University Jazan, Kingdom of Saudi Arabia

Corresponding Author: Shailesh M Gondivkar, Department of Oral Medicine and Radiology, Government Dental College & Hospital, Nagpur, Maharashtra, India, Phone: +919604121273 e-mail: shailesh_gondivkar@yahoo.com

popular habit of areca nut and its preparations, easy access, effective price changes, and marketing strategies.^{4,5} Mortality rate is significant because it transforms into oral cancer, particularly squamous cell carcinoma at a rate of 7 to 30%.²

Quality of life is a vital and often-required health outcome measure that is relevant to the patients care. The QoL is a general term integrating several aspects of life, such as physical, psychological, social, economic, spiritual, cognitional, and sexual dimensions. A disturbance in any one aspect will in turn affect the other domains and this influences the overall QoL.⁶ The QoL assessment should be part of the evaluation of oral health in day-to-day practice.⁷ Oral submucous fibrosis patients experience significant health-related symptoms including reduced mouth opening, burning sensation, and inability to eat, which are quite unique as compared with other oral pathologies. Along with social and emotional distress, these patients are always afraid of developing a cancer resulting in increased psychiatric morbidity.⁸ Thus, OSF definitely has an impact on QoL of affected individuals. Because of the uniqueness of OSF in terms of clinical presentation as well as subjective symptoms, it warrants special requirement for QoL assessment.

There is paucity of literature on QoL assessment in OSF patents⁹ in spite of its higher prevalence^{2,3} and malignant potential.² This might be due to unavailability of a condition-specific QoL measure for OSF. Patient-reported outcome measures were identified as a research priority and have been routinely used nowadays. A PROM reflects a patient's perceptions of general health and well-being; which are routinely quantified by administration of questionnaires.¹⁰ Past studies used generic questionnaires for the assessment of QoL in OSF patients.¹¹⁻¹³ However, these generic instruments lack the sensitivity to evaluate the QoL accurately, as they are applicable to a wide variety of populations and disease states. The necessity of the work in this area has recently been recognized by Rai.¹⁴ With this dire need in mind, the present study was designed to focus on the outcomes and experiences of the OSF patients with a view to developing a proper PROM for OSF patients specifically.

MATERIALS AND METHODS

Recruitment

Institutional Ethics Committee approval was obtained before the commencement of the study and all the patients signed the written informed consent. A total of 30 clinically diagnosed OSF patients were recruited in the study irrespective of the age, gender, education, occupational status, income, and severity of OSF by purposive sampling method. The OSF cases were categorized based

on the following clinical criteria: intolerance to hot and spicy foods, pale-looking oral mucosa, palpable fibrotic bands, and chronic progressive trismus.^{15,16} Inclusion criteria included patients above 18 years of age, who were willing to participate, able to understand, and complete the questionnaire on their own. Exclusion criteria for the study included patients with any systemic disorder, any oral lesion except OSF, and the presence of clinically suspicious malignant changes. A thorough case history was recorded including the sociodemographic information, and diagnosis of OSF was made by clinical examination. Interincisal mouth opening was measured using a digital Vernier caliper. For burning sensation, the visual analog scale score was recorded. The severity of OSF was graded based on the degree of mouth opening into stage I (35–40 mm), stage II (30–34 mm), stage III (20–29 mm), and stage IV (< 20 mm).¹⁷

Data Collection

A grounded theory approach¹⁸ with constant comparison was used throughout the research. Open-ended interviews and focus group discussions were performed with 30 adults with OSF to identify the factors that patients view as important for their oral health and overall well-being. These patients were characterized by a wide degree of disease severity and diverse range of sociodemographic profile. A single researcher performed 14 personal (one-to-one) interviews and four focus group discussions in the Marathi language (the native language of the study population) in nonclinical settings. Interviews were open, semi-structured in nature with prompts.¹⁹ Patients were motivated to talk freely about their oral health-related problems in focus group discussions.²⁰ The prompts encouraged exploration of patients' perceptions on the history, diagnosis, and progression of OSF. Interview prompts (Table 1) were informed by the clinical experts and patient input. Relevant topics were pooled from thorough literature review. Additionally, a panel of eight experts (specialist in oral medicine, oral pathology, oral surgery, and psychology) was approached using the Delphi technique²¹ to understand the affected aspects of patient's life due to OSF. The duration of each interview was around 20 minutes and each focus group discussion lasted for more than half an hour. None of the recruited patient had any preexisting relationship with the interviewer in any context. Interviews and focus group discussions were audio recorded. The field notes were recorded to document particular details about the process. The recording was then anonymized, transcribed, and translated in English at the same time.²² A saturation table was prepared using the data from each patient (Table 2).

Table 1: Patient interview prompts

<i>Interview prompts</i>
Hello, introduction, confirmation of procedure
How are you today?
Confidentiality of the interviews
History of mouth condition
Mouth opening
Burning sensation
Taste sensation
Dryness of mouth
Mouth ulcerations
Hearing
Tongue movements
Mouth odor
Teeth stains
Brushing
Speaking
Smiling
Eating
Fear of the mouth condition
Fear of worsening the condition
Fear of developing a mouth cancer
Stress
Embarrassment with mouth condition
Frustrated
Sleep pattern
Weakness
Attending social events
Meeting friends and relatives
Social interaction
Is there anything else you'd like to add

Data Analysis

Data analysis was performed by using an in-depth narrative thematic analysis method.²³ Data analysis instituted prior to completing all the interviews to control topic saturation. The data saturation occurred in 10th interview. The data were coded initially and then categorized into themes and subthemes. Initial coding of the interview transcripts was performed independently by two researchers to increase the reliability of data analysis.²⁴ Themes evolved from recurring words and ideas from the patients.²⁵ This part of the analysis was performed by two independent researchers. Intercoder reliability was calculated for each theme and overall coding using percentage agreement and the Kappa statistic. Themes were discussed and granted by agreement of all the authors. The themes were then discussed in the interdisciplinary research team to achieve intersubjective validity of the results.

RESULTS

Demographics and Clinical Outcome

The age of the participants ranged from 20 to 65 years with mean of 33.50 years. Males were more prevalent than

females with a male-to-female ratio of 9:1. Mouth opening ranged from 2 to 37 mm with mean of 19.7 mm. Majority of the participants were graded as stage III (53.33 %) followed by stage II (23.33%), stage IV (16.66%), and stage I (6.66%). Only few (20%) of the study participants were graduates (having bachelor's degree) or had diplomas. A great number (80%) of the participants possessed lower routine and semi-routine occupations and more than half (66.66%) belonged to lower income category (Table 3).

Patient-reported Outcome Measure Analysis

Four main themes emerged from the data analysis: (1) discomfort and functional impairment; (2) psychological wellness; (3) physical wellness, and (4) social wellness. Kappa agreement for all the themes ranged from 0.65 (social wellness) to 0.72 (discomfort and functional impairment) with significant overall kappa agreement (0.67) for all the themes together (Table 4).

Discomfort and Functional Impairment

This theme was the key area of importance for most of the respondents. Two subthemes evolved: discomfort and functional impairment.

The OSF patients had come across several troubles in view of discomfort and functional impairment. Difficulty in mouth opening was the most common complaint reported by all the participants. The diverse amount of mouth opening was reported as per the degree of severity of the disease. A 19-year-old nervous male OSF participant discussed, "I am not able to open my mouth completely as like my friends. I face difficulties during brushing my teeth, especially posterior ones because of reduced mouth opening." Another participant (36-year-old female) reported "being unable to eat big bites of foods due to limited mouth opening, I think, I am undernourished as I have to be dependent on liquid diet most of the times."

The second most common complaint reported was burning sensation. Majority of the participants experienced burning sensation in the oral cavity. "I am experiencing very severe burning sensation; I used to enjoy my favorite foods (naming some Indian spicy dishes) which I do not anymore now. Everyone in my family have to eat less spicy foods as same food is being cooked for everyone in my family" (29-year-old male). One young male participant (20-year-old) with stage IV disease informed, "Being foodie person, I used to visit restaurants and street food courts quite frequently. Recently, my burning sensation has increased to such an extent that I have stopped visiting such places."

Few patients reported changes in their taste sensation. A 23-year-old female participant discussed "I think, I am

Table 2: Data saturation table describing the emergence of new codes with the interviews

	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11	I-12	I-13	I-14	FG-1	FG-2	FG-3	FG-4
Difficulty in mouth opening	X																	
Burning sensation	X																	
Difficulty in eating	X																	
Discomfort in having foods/drinks	X																	
Unable to eat desired foods		X																
Difficulty in performing oral hygiene			X															
Taste alteration	X																	
Enjoying food		X																
Dryness in mouth			X															
Chewing difficulty	X																	
Speaking		X																
Smiling				X														
Hearing loss						X												
Eating habits			X															
Oral ulcerations			X															
Tongue movements		X																
Oral malodor		X																
Awkward with teeth stains								X										
Family relationship		X																
Relationship with friends	X																	
Social activities	X																	
Fear of the mouth condition	X																	
Fear of worsening the condition	X																	
Worried about turning into malignancy	X																	
Stress	X																	
Embarrassment							X											
Sleeping pattern										X								
Weakness									X									
Need rest									X									
Work or employment															X			
Attending social events	X																	

I: Interview; FG: Focus group; X: Interview in which a new concept was discussed

Table 3: Patient demographics and clinical outcome

Parameter	n
Age (years)	
Mean (SD)	33.50 (45.48)
Range	20–65
Gender	
Male	27
Female	3
Male:female ratio	9:1
Educational status	
Graduates	3 (10%)
Diplomas	3 (10%)
12th pass	16 (53.33%)
10th pass	8 (26.66%)
Employment status	
Employed	25 (83.33%)
Unemployed	3 (10%)
Retired	2 (6.66%)
Occupational status	
Higher	2 (6.66%)
Intermediate	4 (13.33%)
Lower	24 (80%)
Socioeconomic status	
High	3 (10%)
Middle	7 (23.33%)
Low	20 (66.66%)
Clinical stages of OSF	
Stage IV	5 (16.66%)
Stage III	16 (53.33%)
Stage II	7 (23.33%)
Stage I	2 (6.66%)

SD: Standard deviation

Table 4: Kappa coefficient and percentage agreement between the coders

Themes	Kappa	Agreement (%)	p-value
Discomfort and functional impairment	0.72	99.42	<0.001
Psychological wellness	0.68	98.62	<0.001
Physical wellness	0.71	99.13	<0.001
Social wellness	0.65	98.10	<0.001
All themes	0.67	97.98	<0.001

feeling a bit of dryness in my mouth since few months and find difficulties in recognizing a taste of food sometimes." Another male participant 32 years of age expressed, "I want to get rid of this my mouth condition, it started with burning sensation and my taste sensation has also altered these days. I am foodie person and I do not enjoy my dearest food dishes since last 2 years." Its very disheartened to listen when one participant described his worsened taste as "I am eating just for the sake of living" (50-year-old male).

Three (10%) participants expressed concern at being unable to speak clearly. A 49-year-old male participant explained, "I feel along with my reduced mouth opening, its getting difficult for me to pronounce some words clearly. My dentist informed me regarding a bit of

immobility of my tongue when this my mouth condition got diagnosed for the first time." Another male participant (29-year-old) discussed "my family and few friends noticed unclear words when I talk to them." Intriguingly, a 34-year-old male sales representative with a stage IV disease reported, "I am not able to convince my clients efficiently due to troubles with pronunciation and clarity of words, which has significantly affected my business."

Psychological Wellness

Many of the participants (76%) experienced psychological imbalance because of their mouth condition. Initially, some patients were shocked to discover their mouth condition. Most of them revealed their fear after knowing about the severity of the disease.

"I am worried and feel frustrated because of reduced mouth opening, burning sensation and difficulty in eating food. As soon as I diagnosed with the OSF and come to know its potential of turning into cancer, I am continuously thinking about the chances of having cancer in my mouth. Since that day, I am looking for different ways to cure the condition leading to difficulty in concentrating on my routine work and loss of enthusiasm in life" (35-year-old male).

Another 46-year-old participant described, "because of reduced mouth opening, it is difficult for me to brush all teeth and maintain good oral hygiene. The bad odor from my mouth frustrates me and creates embarrassing situations many times at my work place as well as at home. This also results in feeling of low esteem and creating loss of interest and loneliness these days."

One young 21-year-old college-going student admitted that "the stress of studies is one of the reason for starting kharra/gutkha (popular areca nut preparations in India) chewing habit. After three years, I noticed limited mouth opening. As I learnt about this condition over the internet, it aggravated my stress as I got scared of developing a cancer. However, after accepting the fact, I was relieved and looking forward to life positively with treatment of my mouth condition."

A 27-year-old unmarried female participant expressed, "I feel depressed and rejected due the reduced mouth opening. Lack of appetite and reduced food intake because of burning sensation and loss of taste results in weight loss. My parents always express concern regarding delays in my marriage. We tried multiple doctors for speedy recovery of the condition and to avoid further complications, such as cancer."

Physical Wellness

Four (13.33%) male participants reported changes in their sleep patterns. A 24-year-old male participant

explained, "It was a horrible night for me when I come to know about this mouth condition from my dentist. I was awake almost all hours of that night." Another participant (29-year-old male) expressed, "in the initial days after diagnosis I could easily sleep at night, but as this condition causing newer consequences day-by-day, its been disturbing my sleep these days." Remaining two participants were also reported of being out of their sleep routines. Other participants explained of having decent, comfortable night's sleep.

Only 2 (6.66%) male participants reported changes in their level of fatigue and need for more rest. Both of them explained as "feeling overall weakness due to mouth condition. Very limited mouth opening and burning sensation in the mouth restrains from eating food and feel like to have more rest during daily routine work."

Social Wellness

This is another important emerged theme. Majority of the participants (76%) deal off with their compromised social interactions.

A 25-year-old male participant expressed "though I love to join friends and relatives frequently, I make an effort these days to stay away from parties and functions. I feel offended as I am unable to eat normal food like others due to my restricted mouth opening and burning sensation." Another participant (42-year-old) described "it is very humiliating for me to ask for less spicy food to my wife in front of my children. Also, it is very embarrassing for me when my parents ask about the reasons for not being able to open the mouth completely. I feel like I am getting somewhat away from my family members."

We noticed that majority of the participants started habit of kharra/gutkha chewing due to peer pressure. However, very few participants pointed out enjoyment factor as the reason for starting the habit. A great number of participants felt "sense of well-being" or stimulating effect immediately after kharra/gutkha chewing. Participants reported mixed feelings regarding experiencing stress relief after kharra/gutkha chewing. Unfortunately, many participants expressed "I feel agitated when cannot chew kharra/gutkha if needed. I quit this habit many times but unable to overcome the craving."

DISCUSSION

The World Health Organization (WHO)²⁶ states, "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity." Oral health-related QoL (OHRQoL) is an integral part of general health and well-being and is recognized by the WHO as an important segment of the Global

Oral Health Program. Past studies reported a negative impact of OSF on OHRQoL of many patients.^{8,11-13,27} and still further research is needed in this area, especially in South Asian countries, where prevalence of habit-related OSF is high. Unfortunately, at present, such attempts are restrained by an unavailability of a proper validated condition-specific PROM for OSF. Recently, Tadakmadla et al²⁸ developed oral potentially malignant disorders QoL (OPMDQoL) questionnaire and found it valid and reliable to assess QoL in OPMDs like oral lichen planus, oral leukoplakia, and OSF. However, these three oral mucosal lesions have varying signs and symptoms.¹⁴ Thus, there is a clear need of more research in this field to bring clarity and validity to the subjective symptoms experienced by OSF patients. Rai¹⁴ suggested that future researches should develop and validate a condition-specific OHRQoL measure for OSF.

The utilization of PROs is an emerging metric and is becoming an increasingly important in health care.²⁹ A PROM is an instrument used to quantify health-related QoL outcome variables from patient's perspectives.³⁰ Thus, PRO is a patient-reported assessment of health status rather than observer-reported health-related QoL data.³¹ The OHRQoL is a PRO that reflects an integral aspect of general health and well-being.³² This study involves our first step toward the development of an OHRQoL-OSF, specifically for OSF.

This study incorporated both personal interviews and focus group discussion to collect qualitative data. Personal interviews help in comprehensively attaining information on an individual's personal experience. However, focus groups facilitate patients to share their experiences by using other's ideas as cues. We have used semi-structured interviews as they offer flexibility and are less time consuming. The data saturation was achieved in the 10th interview which confirms the adequacy of sample size. Also, patients with diverse range of characteristics, such as age, gender, education, employment status, occupation, income, and varying levels of disease severity were considered.

Four main themes were identified: discomfort and functional impairment, psychological wellness, physical wellness, and social wellness.

The most distressing problem experienced by the participants was limited mouth opening. Burning sensation was the second most common complaints of the patients. This study found patients dealing with burning sensation while having food in combination with altered or worsened taste sensation. These above-mentioned problems altogether made participants to change their eating habits and to avoid their food of choice. Few participants also experienced discomfort during talking in the form of unclear words. Psychological distress was

noticed to be prevalent in our participants. Some participants got scared immediately after diagnosis of their mouth condition as they were aware about OSF and its consequences. Others when they came to know regarding malignant potential of OSF were always worried of possibility of having mouth cancer. The term "cancer" is itself associated with fear and stigma in India.³³ Few patients reported lack of interest and enthusiasm in life while others felt low esteem and embarrassment at their workplaces. Sleep disruption has been recognized as detrimental by some participants. Problems with sleep as a direct result of fear of OSF and cancer have been explored in these participants. Many participants reported their mouth condition as having a debilitating effect on their social interaction. Tadakmadla et al³⁴ noticed the greater impact of OPMDs on QoL with physical impairment and functional limitations as the most distressing complaints. They also reported affected psychological and social wellness of the patients.

Thus, the overall scenario demonstrated impact of OSF on different aspects of individual's life. "Discomfort and functional impairment" was noticed to be most recognized theme by our participants. However, OSF also has impacts on other important domains, namely, psychological, social, and physical wellness of the participants. Looking at the reports of this study, patients' perspectives should be taken into consideration along with thorough clinical examination to best describe the sense of well-being of an individual and to decide the overall health care needs of the patients. Some of the limitations of the study included that the demographic distribution of participants was very homogeneous due to the local patient population.

These interview themes and issues procured from the focus group discussions were used to develop potential candidate items for a new condition-specific questionnaire (OHRQoL-OSF) for OSF patients. Patient-reported issues can give vital insights into patient's perspectives through their experiences. The OHRQoL-OSF questionnaire was subsequently tested, refined, and validated to use as a clinical assessment tool for OSF patients specifically. We presume that future studies can be conducted across various cultural and language contexts by administering this questionnaire.

ACKNOWLEDGMENT

The authors wish to thank the patients who took part in the study.

REFERENCES

1. Warnakulasuriya S, Johnson NW, van der Waal I. Nomenclature and classification of potentially malignant disorders of the oral mucosa. *J Oral Pathol Med* 2007 Nov;36(10):575-580.
2. Shevale VV, Kalra RD, Shevale VV, Shringarpure MD. Management of oral sub-mucous fibrosis: a review. *Indian J Dent Sci* 2012 Jun;2(4):107-114.
3. Hazarey VK, Erlewad DM, Mundhe KA, Ughade SN. Oral submucous fibrosis: study of 1000 cases from central India. *J Oral Pathol Med* 2007 Jan;36(1):12-17.
4. Balasimha, D.; Rajagopal, V. *Areca nut monograph*. Kasaragod: Central Plantation Crops Research Institute; Indian Council of Agricultural Research; 2004. pp. 224-239.
5. Tilakaratne WM, Klinikowski MF, Saku T, Peters TJ, Warnakulasuriya S. Oral submucous fibrosis: review on aetiology and pathogenesis. *Oral Oncol* 2006 Jul;42(6):561-568.
6. Taylor, SE. *Health psychology*. 3rd ed. New York: McGraw-Hill Inc; 1995.
7. Gondivkar SM, Gadail AR, Sarode SC, Patil S. Quality of life assessment should be part of oral health evaluations in day-to-day practice. *J Contemp Dent Pract* 2017 Oct;18(10):857-858.
8. Tadakamadla J, Kumar S, Johnson NW. Quality of life in patients with oral potentially malignant disorders: a systematic review. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2015 Jun;119(6):644-655.
9. Kerr AR, Warnakulasuriya S, Mighell AJ, Dietrich T, Nasser M, Rimal J, Jalil A, Bornstein MM, Nagao T, Fortune F, et al. A systematic review of medical interventions for oral submucous fibrosis and future research opportunities. *Oral Dis* 2011 Apr;17(Suppl 1):42-57.
10. Kerr C, Nixon A, Wild D. Assessing and demonstrating data saturation in qualitative inquiry supporting patient-reported outcomes research. *Expert Rev Pharmacoecon Outcomes Res* 2010 Jun;10(3):269-281.
11. Rimal J, Shrestha A. Validation of Nepalese Oral Health Impact Profile14 and Assessment of its impact in patients with oral submucous fibrosis in Nepal. *J Nepal Health Res Counc* 2015 Jan-Apr;13(29):43-49.
12. Jiang X, Zhang Y, Li F, Zhu Y, Chen Y, Yang S, Sun G. Allicin as a possible adjunctive therapeutic drug for stage II oral submucous fibrosis: a preliminary clinical trial in a Chinese cohort. *Int J Oral Maxillofac Surg* 2015 Dec;44(12):1540-1546.
13. Tadakamadla J, Kumar S, Lalloo R, Gandhi Babu DB, Johnson NW. Impact of oral potentially malignant disorders on quality of life. *J Oral Pathol Med* 2017 Aug;47(1):60-65.
14. Rai A. Developing a quality of life questionnaire for oral submucous fibrosis patients. *J Oral Pathol Med* 2017 Nov;46(10):1054-1055.
15. Pindborg JJ, Murti PR, Bhonsle RB, Gupta PC, Daftary DK, Mehta FS. Oral submucous fibrosis as a precancerous condition. *Scand J Dent Res* 1984 Jun;92(3):224-229.
16. Pindborg JJ, Sirsat SM. Oral submucous fibrosis. *Oral Surg Oral Med Oral Pathol* 1966 Dec;22(6):764-779.
17. Lai DR, Chen HR, Huang YL, Tsai CC. Clinical evaluation of different treatment methods of oral submucous fibrosis. A 10-years' experience with 150 cases. *J Oral Pathol Med* 1995 Oct;24(9):402-406.
18. Glaser, BG.; Strauss, AL. *The discovery of grounded theory: strategies for qualitative research*. Chicago (IL): Aldine; 1967.
19. Polit, DF.; Beck, CT. *Nursing research: generating and assessing evidence for nursing practice*. Philadelphia (PA): Wolters Kluwer Health/Lippincott Williams & Wilkins; 2012.
20. Streiner, DL.; Norman, GR. *Devising the items*. In: Streiner DL, Norman GR, editors. *Health measurement scales: a practical guide to their development and use*. New York: Oxford University Press; 2003. p. 15.

21. Hsu C, Sandford BA. The Delphi technique: making sense of consensus. *Pract Assess Res Eval* 2007 Aug;12(10):1-8.
22. Nikander P. Working with transcripts and translated data. *Qual Res Psychol* 2008 Jul;5(3):225-231.
23. Riessman, CK. *Narrative methods for the human sciences*. Los Angeles (CA): Sage Publications; 2008.
24. Barbour R. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *BMJ* 2001 May;322:1115-1117.
25. Graneheim, UH.; Lundman, B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004 Feb;24(2):105-112.
26. WHO. *The World Oral Health Report 2003: continuous improvement of oral health in the 21st century-the approach of the WHO Global Oral Health Programme*. Geneva: World Health Organization; 2003.
27. Kularatna S, Whitty JA, Johnson NW, Jayasinghe R, Scuffham PA. A comparison of health state utility values associated with oral potentially malignant disorders and oral cancer in Sri Lanka assessed using the EQ-5D-3 L and the EORTC-8D. *Health Qual Life Outcomes* 2016 Jul;14:101.
28. Tadakmadla J, Kumar S, Lallo R, Johnson NW. Development and validation of a quality-of-life questionnaire for patients with oral potentially malignant disorders. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2017 Mar;123(3):338-349.
29. Cano SJ, Browne JP, Lamping DL. Patient-based measures of outcome in plastic surgery: current approaches and future directions. *Br J Plast Surg* 2004 Jan;57(1):1-11.
30. Calvert M, Blazeby J, Altman DG, Revicki DA, Moher D, Brundage MD; CONSORT PRO Group. Reporting of patient-reported outcomes in randomized trials: the CONSORT PRO extension. *JAMA* 2013 Feb;309(8):814-822.
31. Cano SJ, Klassen A, Pusic AL. The science behind quality-of-life measurement: a primer for plastic surgeons. *Plast Reconstruct Surg* 2009 Mar;123(3):98e-106e.
32. John MT, Hujuel P, Miglioretti DL, LeResche L, Koepsell TD, Micheelis W. Dimensions of oral-health-related quality of life. *J Dent Res* 2004 Dec;83(12):956-960.
33. Dinshaw KA, Shastri SS, Patil SS. Cancer control programme in India: challenges for the new millennium. *Health Adm* 2005;18(1):10-13.
34. Tadakmadla J, Kumar S, Lallo R, Johnson NW. Qualitative analysis of the impact of Oral Potentially Malignant Disorders on daily life activities. *PLoS One* 2017 Apr;12(4):e0175531.