

Clinical Profile, Oral Health Knowledge and Lived Experiences of Patients with Potentially Malignant Oral Lesions: A Convergent Mixed-Methods Study.

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Research Article

Keywords: Potentially malignant oral lesions, oral health knowledge, clinical profile, mixed-methods study, health-seeking behaviour, oral cancer prevention

Posted Date: July 9th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10231412/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Potentially malignant oral lesions (PMOLs) are recognised precursors of oral squamous cell carcinoma, and their progression is closely linked to oral health knowledge, behavioural risk factors, and delayed health-seeking behaviour. Understanding both the clinical/behavioural profile of affected patients and their lived experience of diagnosis and care is essential for designing effective early-detection and prevention strategies.

Objective

To assess the oral health knowledge, practices, and clinical/behavioural profile of patients with PMOLs, and to explore their experiences, awareness, and health-seeking behaviour, using a convergent mixed-methods design.

Methods

A convergent mixed-methods study was conducted among 60 patients diagnosed with potentially malignant oral lesions (Leukoplakia (13.5%), Oral submucous Fibrosis (13.5%) and Tobacco pouch Keratosis patients (73%)), in which the quantitative strand employed a structured interview schedule (adapted from the WHO Oral Health Surveys questionnaire) to assess demographic characteristics and 25 oral health knowledge and practice items, analysed using SPSS v17.0 with descriptive statistics and chi-square tests, while the qualitative strand involved in-depth interviews with a purposively selected subgroup of 15 participants representing different lesion types and oral health knowledge levels until thematic saturation was achieved, with data analysed using Braun and Clarke's six-phase thematic analysis; findings from both strands were integrated at the interpretation stage following Creswell and Plano Clark's convergent mixed-methods design.

Results

Sixty-seven percent of participants demonstrated poor oral health knowledge and 70% reported poor oral hygiene practices; knowledge and practice were significantly associated with education, occupational history, and dietary pattern ($p < 0.05$ for all). Qualitative analysis (thematic framework presented; illustrative participant quotations to be inserted from transcript data) identified themes of limited awareness of PMOLs, delayed healthcare-seeking, continued tobacco/areca nut use after diagnosis, perceived barriers to habit cessation, and the need for structured counselling and family support. Integration of both strands indicated that low oral health knowledge and unaddressed behavioural risk factors jointly explained both the clinical presentation of lesions and the delay in seeking care.

Conclusion

A mixed-methods approach provides a more complete picture of PMOLs than either strand alone, underscoring the need for early screening, patient education, behavioural counselling, and multidisciplinary, family-inclusive care to reduce the risk of malignant transformation.

INTRODUCTION

Oral cancer remains a significant global health concern, ranking among the most prevalent cancers and a leading cause of cancer mortality in South-Central Asia¹. Oral potentially malignant disorders (OPMDs) are alterations of the oral mucosa that carry an elevated risk of progression to malignancy; early detection through thorough clinical examination, together with the adoption of protective oral health behaviours, is critical to preventing this progression and improving outcomes⁽²⁾.

Populations with socio-economic disparities, limited healthcare access, and a high prevalence of tobacco and areca-nut use — such as coastal communities in and around Chennai — carry a disproportionate burden of OPMDs⁽³⁾. Prior quantitative surveys have documented the extent of poor oral health knowledge and hygiene practice in such populations, while qualitative work elsewhere has shown that lesion progression and delayed care-seeking are shaped as much by patients' beliefs, fears, and social circumstances as by clinical severity. Because neither a purely numerical description nor a purely narrative account fully captures this interplay, this study adopts a convergent mixed-methods design⁽¹⁰⁾, collecting and analysing quantitative clinical/behavioural data and qualitative interview data concurrently, then merging the two strands during interpretation to build a fuller understanding of the condition and the patients who live with it.

Patients with potentially malignant oral disorders (OPMDs) experience significant physical, psychological, and social challenges, yet early detection and timely intervention at the community level remain inadequate. Conventional management primarily focuses on clinical surveillance, pharmacological treatment, surgical excision of lesions when indicated, and regular follow-up to monitor malignant transformation. While these approaches are essential, they often overlook modifiable behavioural risk factors such as tobacco and areca nut use, poor oral hygiene practices, and inadequate oral health knowledge. Limited emphasis is placed on patient education, behaviour modification, and psychosocial support, despite their critical role in reducing disease progression and improving long-term outcomes. Many patients continue harmful oral habits even after receiving professional advice, highlighting the need for comprehensive behavioural interventions. Evidence suggests that behavioural empowerment strategies grounded in health promotion and cognitive-behavioural principles can enhance oral health knowledge, self-efficacy, treatment adherence, and healthy lifestyle practices. These interventions promote patient-centred education, motivation, habit cessation, goal setting, and coping skills, enabling individuals to actively participate in their care. Empowering patients with OPMDs to adopt healthier behaviours may therefore contribute to improved disease management and reduce the risk of malignant transformation. (5–9)

OBJECTIVES

- To assess the oral health knowledge and behavioural practices of patients with potentially malignant oral lesions (quantitative strand).
- To examine associations between oral health knowledge/practice and selected demographic variables (quantitative strand).
- To explore patients' perceptions, healthcare-seeking experiences, challenges, and awareness regarding oral cancer prevention (qualitative strand).
- To integrate the quantitative and qualitative findings to develop a comprehensive understanding of the clinical, behavioural, and experiential profile of PMOL patients.

MATERIALS AND METHODS

Study Design

A convergent (concurrent) mixed-methods design was used, in which quantitative and qualitative data were collected during the same study period, analysed separately using methods appropriate to each strand, and then merged at the interpretation stage to compare, contrast, and integrate the findings(10).

Setting and Population

The study was conducted among patients with potentially malignant oral lesions attending a adopted Primary Health Centres (PHCs) affiliated with Sathyabama Dental and General Hospital, in Chennai, Tamil Nadu. The accessible population comprised patients clinically diagnosed with PMOLs during the study period.

Sample Size and Sampling

Sixty (n = 60) patients with potentially malignant oral lesions (PMOLs) were enrolled in the quantitative strand using a convenience sampling technique and were interviewed and clinically evaluated over a one-month period, while the qualitative strand included a purposively selected subgroup of 15 participants, sampled to ensure representation across lesion type and oral health knowledge scores, who were interviewed until thematic saturation was achieved.

Quantitative Data Collection

Data were collected using a structured interview schedule comprising demographic variables (age, sex, religion, education, occupation, socioeconomic status, income, dietary pattern, type of family, place of residence) and 25 close-ended items assessing oral health knowledge and practice, adapted from the WHO Oral Health Surveys: Basic Methods questionnaire(9). The tool was pretested, and face and

content validity were established by a panel of experts in dentistry, public health, and epidemiology; expert feedback was incorporated prior to administration.

Qualitative Data Collection

In-depth, semi-structured interviews were conducted with the purposively selected subgroup to explore participants' perceptions of their condition, healthcare-seeking experiences, challenges in accessing care, continued tobacco/areca nut use after diagnosis, and awareness of oral cancer prevention. An interview guide comprising eight open-ended questions with appropriate probing prompts was used. Interviews were conducted face-to-face in Tamil, lasted approximately 30–45 minutes, and were audio-recorded with participants' written consent. The recordings were transcribed verbatim in Tamil and subsequently translated into English. To ensure accuracy, the translated transcripts were reviewed and cross-checked against the original recordings before thematic analysis.

Data Analysis

Quantitative data were analysed using SPSS version 17.0. Descriptive statistics (frequencies, percentages, mean, standard deviation) summarised demographic and behavioural variables; chi-square tests examined associations between oral health knowledge/practice and demographic variables, with $p < 0.05$ considered statistically significant.

Qualitative data were analysed using Braun and Clarke's six-phase thematic analysis approach (11), familiarisation with transcripts, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final thematic report.

Integration

Consistent with convergent mixed-methods practice (10), the quantitative and qualitative results were analysed independently and subsequently merged using a joint display to compare where the two strands converged, diverged, or offered complementary insight.

Ethical Considerations

Ethical approval was obtained from the Sathyabama Institute of Human Ethics Committee. Written informed consent was obtained from all participants for both the clinical/behavioural assessment and (for the interview subgroup) audio-recorded interviews.

RESULTS

A. Quantitative Results

The quantitative findings describe the distribution of lesion types among participants (Fig. 1), along with oral health knowledge, practice, and the demographic factors associated with them among the 60

participants (Tables 1–3).

Table 1
Distribution of knowledge and practice regarding oral health care

Category	Good Knowledge (%)	Poor Knowledge (%)	Good Practices (%)	Poor Practices (%)
Patients (n = 60)	40 (33%)	20 (67%)	18 (30%)	42 (70%)

Table 2
Mean and standard deviation
for oral health-seeking
behaviour

Metric	Value
Mean	11.63
Standard Deviation	10.89

Table 3
Chi-square associations between
knowledge/practice and selected factors

Factor	Significance (p-value)
Education	< 0.05
Occupational History	< 0.05
Dietary Patterns	< 0.05

Overall, 67% of participants demonstrated poor oral health knowledge and 70% reported poor oral hygiene practice. Knowledge and practice were significantly associated with education, occupational history, and dietary pattern ($p < 0.05$ for each factor).

B. Qualitative Results

Thematic analysis of the interview data was organised around five themes, consistent with the study's a priori focus on awareness, care-seeking, and behavioural barriers. Each theme is outlined below with its core pattern; direct participant quotations are marked as placeholders pending transcript integration.

Theme 1: Limited Awareness of Potentially Malignant Oral Lesions

Participants frequently described minimal understanding of what a PMOL is, its malignant potential, or the significance of a formal diagnosis, often only becoming aware of the seriousness of their condition at an advanced clinical stage.

"I thought it was just a small mouth ulcer that would heal on its own. I never imagined it could become something serious like cancer." (Participant 3)

"The doctor told me it was a potentially dangerous lesion, but before that I had no idea that chewing tobacco could cause such a problem. I only realized the seriousness after the diagnosis." (Participant 11)]

Theme 2: Delayed Healthcare-Seeking

Participants described postponing consultation for weeks or months after first noticing oral changes, attributing delay to lack of pain, cost concerns, fear of a cancer diagnosis, or reliance on home remedies before seeking formal care.

"At first, I ignored the white patch because it wasn't painful. I thought it would disappear on its own, so I waited for several months before going to the health centre." (Participant 5)

"I was afraid the doctor might say it was cancer, so I kept postponing the visit. I tried home remedies first, but the lesion didn't improve." (Participant 9)]

Theme 3: Continued Tobacco and Areca Nut Use Despite Diagnosis

Several participants reported continuing tobacco or areca-nut use even after being informed of their diagnosis, citing addiction, habitual/social use, and difficulty replacing the habit in daily routines.

"The doctor advised me to stop chewing tobacco immediately, but I have been using it for more than 20 years. I know it is harmful, but it is very difficult to quit." (Participant 7)

"Even after I was told about the lesion, I continued chewing areca nut because it had become part of my daily routine. Whenever I tried to stop, I felt uncomfortable and started using it again." (Participant 14)]

Theme 4: Perceived Barriers to Habit Cessation

Barriers described included social and peer pressure, stress relief, absence of accessible cessation services, and limited follow-up support after the initial diagnosis or counselling session.

"Most of my friends chew tobacco, and whenever we meet, they offer it to me. It is difficult to refuse because it has been part of our routine for many years." (Participant 6)]

Theme 5: Need for Improved Counselling and Family Support

Participants expressed a desire for more structured, repeated counselling rather than a single session at diagnosis, and highlighted the protective role of family involvement in sustaining behaviour change and treatment adherence.

["My family kept reminding and encouraging me to quit chewing tobacco and attend my follow-up visits. Without their support, I don't think I could have made any changes." (Participant 10)]

C. Integration of Quantitative and Qualitative Findings

A joint display was used to compare the two strands (Table 4). The quantitative finding that 67% of participants had poor oral health knowledge converged with the qualitative theme of limited awareness of PMOLs; similarly, poor oral hygiene practice (70%) and the significant association with education and occupation converged with qualitative accounts of delayed care-seeking and continued habit use. Where the quantitative strand identified the extent of a problem, the qualitative strand offered explanatory depth as to why it occurred.

Table 4
Joint display of quantitative and qualitative findings

Quantitative Finding	Qualitative Theme	Integrated Interpretation
67% poor oral health knowledge	Limited awareness of PMOLs	Knowledge gaps directly underlie delayed recognition of disease significance
70% poor oral hygiene practice	Continued tobacco/areca nut use; barriers to cessation	Behavioural risk factors persist despite diagnosis, sustaining poor practice scores
Knowledge/practice associated with education, occupation, diet (p < 0.05)	Delayed healthcare-seeking; need for counselling/family support	Socio-demographic disadvantage compounds both poor practice and delayed care-seeking

DISCUSSION

The quantitative findings indicate a substantial knowledge gap: most participants knew little about PMOLs or their malignant potential, consistent with earlier research linking low health literacy to worse oral health outcomes and delayed diagnosis(3). Oral health education remains inaccessible to a large portion of the Indian population5, and the present sample's inadequate hygiene habits – infrequent dental visits, inconsistent brushing, and low use of adjunct hygiene products – mirror findings from earlier work linking poor dental hygiene to PMOL development3.

The qualitative accounts add explanatory context to these numbers. Where the quantitative strand shows that education, occupation, and dietary pattern are significantly associated with knowledge and practice, the qualitative themes of delayed care-seeking, persistent habit use, and perceived barriers to cessation describe the lived mechanisms behind those associations – cost, access, fear, addiction, and lack of sustained support. Participants who reported regular dental visits appeared, in the qualitative interviews, to understand their condition better and to be more receptive to behaviour change, but structural barriers such as restricted access to care, financial constraints, and low perceived necessity of routine checkups were repeatedly described as obstacles(4).

The continued use of tobacco and areca nut after diagnosis, reported both behaviourally (quantitative) and narratively (qualitative), aligns with prior work highlighting the difficulty of habit cessation among patients with OPMDs and the need for integrated cessation programmes tailored to high-risk communities (7, 8). The qualitative theme of desired family involvement and repeated counselling – rather than a single session at diagnosis – suggests a concrete, actionable direction for strengthening existing care pathways.

Taken together, the two strands converge on a consistent picture: inadequate oral health knowledge and unaddressed behavioural risk factors jointly shape both the clinical/behavioural profile of PMOL patients and their pattern of healthcare utilisation. Neither strand alone would have captured this relationship as fully – the quantitative data establish the scale of the problem, while the qualitative data illuminate the reasons behind it, together supporting Creswell and Plano Clark's rationale for convergent mixed-methods integration in health research(10).

Limitations

The quantitative sample was drawn by convenience sampling from a single setting, which may limit generalisability. The qualitative subgroup size, sampling criteria, and interview details require finalisation once transcript data are available; the thematic findings presented here should accordingly be treated as a structural framework pending confirmation and illustration with verbatim participant data.

CONCLUSION

This convergent mixed-methods study demonstrates that patients with potentially malignant oral lesions have limited oral health knowledge and largely inadequate oral hygiene practices, with significant associations observed between oral health knowledge and selected demographic variables such as education, occupation, and dietary pattern. The qualitative findings further revealed that poor awareness, delayed healthcare-seeking, continued tobacco and areca nut use despite diagnosis, inadequate cessation support, and limited family involvement contribute to suboptimal disease management and increase the risk of disease progression.

The integration of quantitative and qualitative findings highlights that effective management of potentially malignant oral lesions requires more than clinical diagnosis and treatment. Strengthening community-based oral health education, promoting early screening at the primary healthcare level, and implementing structured behavioural counselling and tobacco cessation interventions are essential to improve early detection and reduce modifiable risk factors. Furthermore, regular follow-up, psychosocial support, and active family participation can enhance treatment adherence, facilitate sustained behaviour change, and improve patient outcomes. A multidisciplinary approach involving dentists, nurses, primary healthcare professionals, and family caregivers is therefore crucial for preventing malignant transformation and reducing the burden of oral cancer.

Declarations

CONFLICT OF INTEREST

NIL

SOURCE OF FUNDING

Self-funding

ETHICAL APPROVAL DECLARATION

Ethical approval for this study was obtained from the Institutional Human Ethics Committee, Sathyabama Institute of Science & Technology.

ACKNOWLEDGEMENT DECLARATION

The authors would like to acknowledge all the researchers and authors whose published studies were included. Their valuable contribution to the existing review made this possible. We also thank our institution for providing necessary resources and support for this study

Author Contribution

A. Thivya N- contributed to the conception and design of the study, analysis and interpretation of findings and drafting of the manuscript.B. Dr.Bamini Devi N-supervised the methodology, ensured methodological rigor, and critically revised the manuscript.C. Dr. Helen Shaji J. C-Provide expert guidance on data analysis and interpretation for the studyD. Dr.Lakshmi L-provided expert guidance on interpretation of results and performed overall manuscript review and final editing.E. Dr. Hema V. H-contributed to literature review, data interpretation, and critical revision of the manuscript for intellectual content.F. Dr. Lisy Joseph- contributed to study design refinement, validation of findings, and manuscript editing.All authors reviewed the manuscript

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Figures

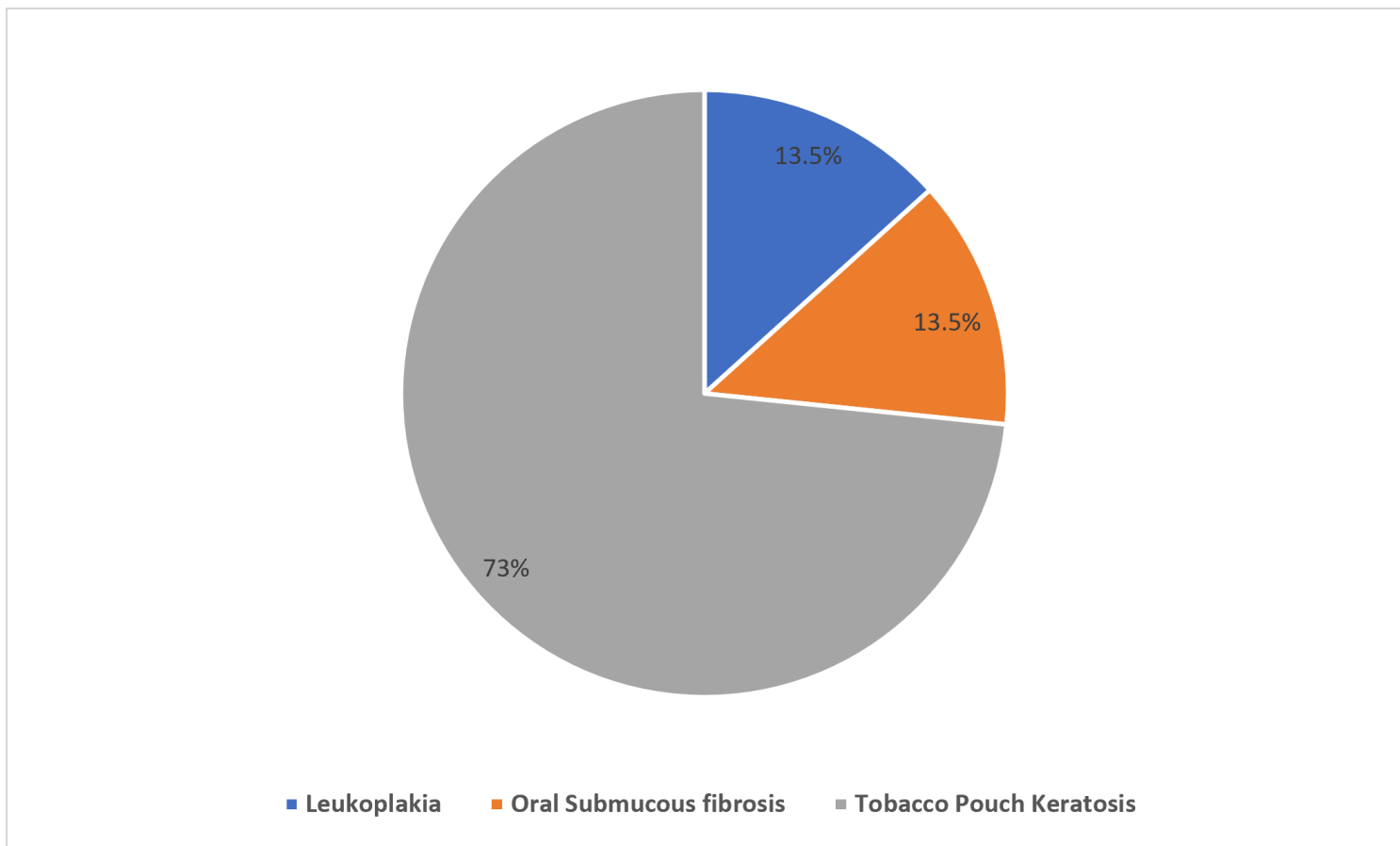


Figure 1

Distribution of Oral Potentially Malignant Disorders among Study Participants