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Original Article

Baseline Assessment and Post-Intervention Evaluation of Knowledge Regarding Oral Submucous Fibrosis Among Medical and Dental Practitioners

Haifa Saquib Baqai, Asma Seher Ansari*, Marjan Alam Khan, Bhunesha Devi, Umer Khayam**, Syeda Noureen Iqbal*****

Department of Oral Biology, Fatima Jinnah Dental College, Karachi Pakistan, *Department of Oral Biology, Dr Ishrat-ul-Ebad Khan Institute of Oral Health Sciences/Dow University of Health Sciences, Karachi Pakistan, **Department of Oral Pathology, Hamdard University, Islamabad Pakistan, ***Department of Oral and Maxillofacial Surgery, Dr Ishrat-ul-Ebad Khan Institute of Oral Health Sciences/Dow University of Health Sciences, Karachi Pakistan

ABSTRACT

Objective: To assess the current approach and post intervention evaluation of knowledge activity in the management of oral sub mucous fibrosis among dental and medical practitioners.

Study Design: Quasi-experimental study.

Place and Duration of study: Dow University of Health Sciences and Fatima Jinnah Dental College Karachi, Pakistan from Oct 2025 to Mar 2026.

Methodology: Data were collected from 300 practitioners using a structured, self-administered questionnaire. Baseline knowledge, attitude, and practice were assessed, followed by an educational intervention as an informational brochure. Post-intervention knowledge was reassessed.

Results: At baseline, dental practitioners showed significantly higher knowledge and better clinical practices compared to medical practitioners (p<0.05). Positive attitudes were observed in both groups, although was higher among dental practitioners. Following the educational intervention, a significant improvement in knowledge scores was observed in both groups (p<0.05), with a relative increase among medical practitioners.

Conclusion: Significant gaps exist in the knowledge and clinical practices of medical practitioners compared to dental practitioners. The educational intervention improved knowledge, emphasizing the importance of targeted educational programs for enhancing early detection and management of OSF.

Keywords: Educational Intervention, Fibrosis, Healthcare Practitioners, Oral Submucous.

How to Cite This Article: *Baqai HS, Ansari AS, Khan MA, Devi B, Khayam U, Iqbal SN. Baseline Assessment and Post-Intervention Evaluation of Knowledge Regarding Oral Submucous Fibrosis Among Medical and Dental Practitioners. Pak Armed Forces Med J 2026; 76(Suppl-10): S1645-S1650. DOI: https://doi.org/10.51253/pafmj.v76iSUPPL-10.14464*

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INTRODUCTION

Oral Submucous Fibrosis (OSF) is a premalignant condition, distinguished by juxta-epithelial fibrosis, mucosal rigidity, and progressive reduction in mouth opening.[1,2] It is primarily linked with the habitual chewing of areca nut, consumed by the general population of South Asian countries, including Pakistan.[3] Due to its increasing prevalence, slow onset and irreversible nature, along with risk of malignant transformation (1%-5%), it poses as a serious challenge for the dental professionals globally.[4] Patients come up with symptoms which can severely affect nutritional status, speech, and overall quality of daily life that highlight its early diagnosis and management.[5,6]

Despite its clinical relevance, the early detection of OSF mainly depends on the awareness and clinical knowledge of healthcare professionals. Dental practitioners are generally more exposed to potentially malignant disorder of oral mucosa,[7] but, medical practitioners also encounter such patients in primary care setups. Therefore, individuals of both professions play significant role in the early detection, counseling, referral, and treatment of OSF.[8]

Previous research has highlighted limitations in knowledge among clinicians regarding the diagnosis, staging, and management of OSF. Inadequate focus on patients counselling and habit cessation further contributes to delayed detection and disease progression. Targeted educational interventions like trainings, workshops and informational brochures can help in overcoming these limitations, thus enhancing clinician's intellect and improving patient care.[9] However, limited data existed to evaluate such interventions on both medical and dental clinicians practicing in Karachi, Pakistan. Therefore, by identifying current gaps and analyzing the impact of targeted educational approaches, this study aims to assess the understanding of medical and dental professional regarding OSF and to evaluate the impact of a brief educational intervention in enhancing their

Correspondence: Dr Haifa Saquib Baqai, Department of Oral Biology, Fatima Jinnah Dental College, Karachi Pakistan

Received: 13 Apr 2026; revision received: 19 Aug 2026; accepted: 20 Aug 2026

knowledge and competence to improve early diagnosis, staging and management of OSF, thus enhancing the quality of life of individuals affected by it.

METHODOLOGY

A quasi-experimental study was conducted among medical and dental practitioners working in both public and private healthcare settings in Karachi, Pakistan. Ethical approval was obtained from the Institutional Review Board (IRB) MARCH -2026-OB02 prior to commencement of the study. The study was carried out over a period of 6 months Oct 2025-March 2026.

Inclusion Criteria: The included study population were licensed medical and dental practitioners who were currently practicing in Karachi and willing to participate and provide informed consent.

Exclusion Criteria: Undergraduate students, house officers, practitioners not directly involved in patient care and those who incomplete or partially filled questionnaires were excluded from the study.

The target population included the medical practitioners (MBBS and above) and Dental practitioners (BDS and above). These practitioners were recruited from Tertiary care hospitals under supervision of Fatima Jinah dental college, Dow university of health and sciences, Hamdard University Hospital and from Private clinics. The sample size was calculated using the. OpenEpi software, assuming a baseline knowledge or correct practice rate of 50% in dental practitioners, a 95% two-sided confidence level, and 80% statistical power, a sample size was determined to detect an anticipated outcome of 34.03%, calculated as 150 participants per group, yielding a total sample size of 300 practitioners.[10] A non-probability convenience sampling technique was used to recruit participants. The participant selection and group allocation is described in Figure-1.

Data were collected using a structured, self-administered questionnaire designed based on previously published KAP studies and relevant literature on OSF. The questionnaire consisted of three parts.

Part A: Pre-intervention with four sub sections:

Section 1: contain demographics data age, gender, qualification, type of practice, and specialty.

Section 2: comprise of understanding (10 questions) assessing the pre intervention part focusing on related etiology, clinical features, diagnosis, malignant potential, and staging. Each correct response was scored as 1, and incorrect/ "don't know" responses as 0.

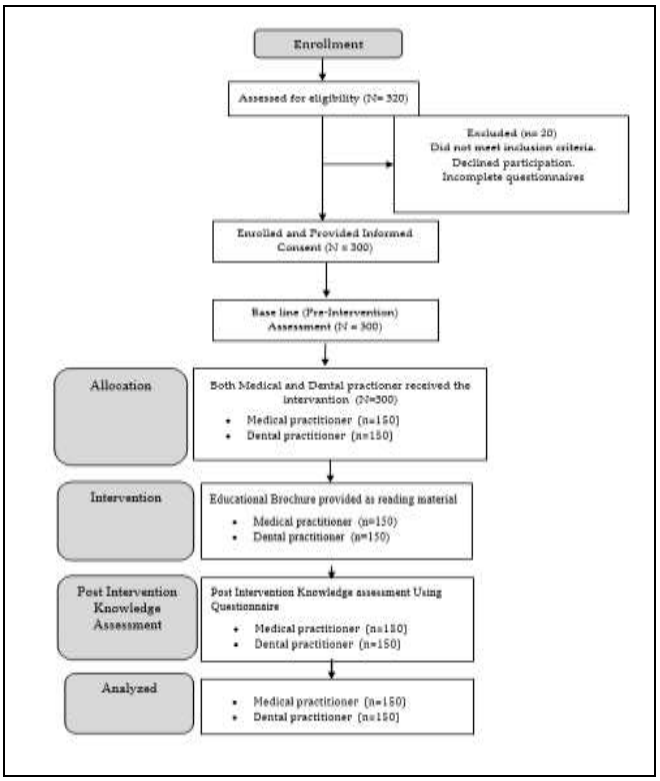


Figure-1: Participants Flow Diagram

Section 3: Attitude which Included 8 statements measured on a 5-point Likert scale: Strongly Agree (5) to Strongly Disagree (1) This section evaluated based on medical and dental practitioners' perception of OSF severity, Importance of early diagnosis, Confidence in diagnosis and management or need for multidisciplinary care.

Section 4: Practice that comprised of 9 questions assessing clinical practices such as: Screening for OSF, history taking, patient counseling, treatment approaches, referral patterns. Responses were scored as: appropriate practice = 1 and inappropriate practice = 0.

This first part with four sections provided baseline Knowledge, attitude, and practice score.

Part B: Intervention

A standardized educational brochure is provided which Included the literature on etiology, early symptoms, staging, diagnosis, and treatment. Each participant was given approximately 5–10 minutes to read the brochure.

Part C: Post-intervention Assessment

Post intervention knowledge was reassessed using Same knowledge questions repeated to measure improvement in the knowledge.

The questionnaire was reviewed by two subject experts to ensure content validity. A pilot study was conducted on 15–20 practitioners to assess clarity and feasibility. Reliability of the attitude section was evaluated using Cronbach's alpha, with a value of α=0.7 considered acceptable. Printed questionnaires were distributed in person to eligible participants at their respective workplaces. The purpose of the study was explained, and informed consent was obtained prior to participation. Participants were requested to complete the questionnaire anonymously to ensure confidentiality and unbiased responses. Completed questionnaires were collected on the same day or within a mutually agreed time.

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 27.

Frequencies and percentages were calculated for categorical variables. Mean±SD for continuous variables. A scoring system was developed and if the practitioner was able to answer 6 out of the 10 questions correctly, from the pre interventive parts of the questionnaire, their knowledge was deemed as adequate and in case of less than 6 correct answers, their knowledge was considered inadequate. Chi-square test was used to compare understanding and awareness between medical and dental practitioners. Paired t-test was applied for comparison of post intervention mean scores. A *p*-value ≤0.05 was considered statistically significant.

RESULTS

A total of 300 practitioners participated in the study, comprising 150(50%) medical and 150(50%) dental practitioners. The demographic distribution is presented in Table-I.

Table-I: Demographic Characteristics of Study Population (n=300)

Variables	Category	Medical (n=150)	Dental (n=150)	Total n (%)
Gender	Male	90(30.0)	82(27.3)	172(57.3)
	Female	60(20.0)	68(22.7)	128(42.7)
Age Group (years)	20–30	50(16.7)	70(23.3)	120(40.0)
	31–40	60(20.0)	50(16.7)	110(36.7)
	>40	40(13.3)	30(10.0)	70(23.3)
Experience (years)	<5	45(15.0)	60(20.0)	105(35.0)
	5–10	55(18.3)	45(15.0)	100(33.3)
	>10	50(16.7)	45(15.0)	95(31.7)

The majority of participants were males172 (57%), with comparable gender distribution between the two groups. Most participants belonged to the 20–30 years age group, followed by 31–40 years. Dental practitioners were relatively younger compared to medical practitioners.

At baseline, dental practitioners demonstrated significantly higher knowledge regarding Oral Submucous Fibrosis (OSF) compared to medical practitioners. A higher proportion of dental practitioners correctly identified as etiological factors (90% vs 60%), clinical features (85% vs 55%), cause of trismus (80% vs 50%), diagnostic methods (80% vs 45%). The detailed comparison of individual knowledge items is shown in Table II, with statistically significant differences observed for most variables (p<0.05).

Based on the scoring criteria, 70% of dental practitioners demonstrated good knowledge compared to only 35% of medical practitioners. Conversely, poor knowledge was more prevalent among medical practitioners (29%) than dental practitioners (7%). This difference was found to be statistically significant (p<0.001), as shown in Table-II.

Table-II: Baseline Understanding Comparison between Medical and Dental Practitioners with Baseline Scores (n=300)

Knowledge Item	Medical Correct n (%)	Dental Correct n (%)	*p*-value*
Heard of OSF	105(70)	142(95)	<0.001
Etiology (Areca nut)	90(60)	135(90)	<0.001
Clinical features	82(55)	128(85)	<0.001
Cause of trismus	75(50)	120(80)	<0.001
Staging awareness	60(40)	112(75)	<0.001
Malignant potential	98(65)	128(85)	<0.001
Diagnosis (biopsy)	68(45)	120(80)	<0.001
Baseline Knowledge level			
Good	53 (35)	105 (70)	<0.001
Moderate	68 (45)	38 (25)	<0.001
Poor	29 (19)	7 ()	<0.001

OSF=Oral Submucous Fibrosis
**chi square test p-value = <0.05*

Both groups exhibited a generally positive attitude towards OSF; however, dental practitioners showed significantly higher confidence levels. Dental practitioners had higher mean scores in confidence in diagnosis, confidence in management and perception of OSF severity. The difference in mean attitude scores between the two groups was statistically significant (p<0.05), as presented in Table-III.

Significant differences were observed in clinical practices between medical and dental practitioners. Dental practitioners were more likely to screen

patients for OSF 75% vs 40%, take habit history 90% vs 65%, provide counseling 85% vs 60%, recommend physiotherapy and follow-up. These differences were statistically significant (p<0.05) and are detailed in Table-III.

Table-III: Mean Difference in Attitude and Practices Between the Study Groups (n=300)

Statement	Medical Mean±SD	Dental Mean±SD	*p*-value**
OSF is serious	4.2±0.8	4.6 ± 0.5	<0.001
Early diagnosis important	4.3±0.7	4.7±0.4	<0.001
Confidence in Diagnosis	3.2±1.0	4.1±0.7	<0.001
Confidence in Management	3.0±1.1	3.9±0.8	<0.001
Practice Behavior	Medical n(%)	Dental n (%)	*p*-value*
Screen for OSF	60(40.4)	112(74.6)	<0.001
Habit history taking	98(65.0)	135(90.0)	<0.001
Counseling	90(60.0)	128(40.0)	<0.001
Referral	82(55.0)	105(70.0)	<0.001
Follow-up	60(40.0)	98(65.0)	<0.001

OSF=Oral Submucous Fibrosis
SD= Standard Deviation
*** Independent sample t test p-value =<0.05*
**chi square test p-value = <0.05*

Following the educational intervention, a significant improvement in knowledge scores was observed in both groups. Medical practitioners mean score increased from 5.8±2.1 to 8.5±1.5.

Whereas dental practitioners mean score increased from 7.5±1.8 to 9.2±1.0. This improvement was statistically significant (p<0.001), as shown in Table-IV.

Table IV: Pre and Post Intervention Knowledge Differences (n=300)

Group	n	Pre-test Mean±SD	Post-test Mean±SD	Mean Difference	*p*-value
Medical	150	5.8 ± 2.1	8.5 ± 1.5	2.7	<0.001
Dental	150	7.5 ± 1.8	9.2 ± 1.0	1.7	<0.001

SD= Standard Deviation
Paired t- test p-value = <0.05

Both groups demonstrated statistically significant improvements following the intervention. For the Medical group, the mean score increased significantly by 2.7, 95% CI. Similarly, the Dental group showed a significant mean increase of, improving from 1.7score, 95% CI. The complete pre- and post-intervention scores for both cohorts are detailed in Table-IV.

DISCUSSION

The present quasi experimental study analyzed the understanding of medical and dental practitioners about Oral Submucous Fibrosis (OSF) and further evaluated the effectiveness of a brief educational intervention on enhancing knowledge and competence of practitioners. Significant disparities were observed between medical and dental practitioners at baseline, along with a distinct improvement in knowledge following the intervention.[10]

At baseline, dental clinicians showed significantly higher knowledge scores in comparison to medical practitioners. Nearly all dental practitioners (95%) had heard about OSF compared with 70% of medical practitioners (p<0.001). Similarly, dental practitioners demonstrated better knowledge regarding the etiological role of areca nut consumption (90% vs 60%), clinical manifestations (85% vs 55%), cause of trismus (80% vs 50%), staging awareness (75% vs 40%), malignant transformation potential (85% vs 65%), and biopsy as a diagnostic method (80% vs 45%), with statistically significant differences for all variables (p<0.05). This is an affirmation that dental professionals are exposed to a higher level of oral mucosal disorders through routine practice, hence becoming more knowledgeable about the presentation, staging, and treatment of oral submucous fibrosis (OSF).[11] Medical clinicians, although are often the first point of contact for a number of patients, still showed low levels of knowledge, especially regarding the staging (40%), confirmation, and treatment of OSF (45%). This is consistent with previous studies that showed a lack of awareness among healthcare professionals regarding potentially malignant disorders of the mouth, excluding dental professionals.[12] The gap between awareness and confidence among medical practitioners creates a pressing need for educational interventions and interdisciplinary education to address such limitations.[13]

When overall knowledge levels were categorized, 70% of dental practitioners exhibited good knowledge compared with only 35% of medical practitioners (p<0.001). Conversely, poor knowledge was observed in 20% of medical practitioners but only 5% of dental practitioners. These findings suggest that although awareness of OSF exists among physicians, substantial gaps remain regarding disease recognition, diagnosis, and management. The results support previous evidence indicating that healthcare professionals outside dentistry frequently possess limited knowledge regarding oral potentially malignant disorders.[12]

The attitude assessment demonstrated generally positive perceptions toward OSF in both groups; however, dental practitioners reported significantly greater confidence in diagnosing and managing the condition. The mean confidence score for diagnosis was 4.1±0.7 among dental practitioners compared with 3.2±1.0 among medical practitioners (p<0.001), while confidence in management was also significantly higher among dentists (3.9±0.8 versus 3.0±1.1, p<0.001). Although both groups strongly agreed that OSF is a serious disease, and that early diagnosis is important, dental practitioners reported significantly higher mean scores for these statements as well. These findings support the observations of other study,[13] who demonstrated that professional exposure and specialty-specific training significantly influence clinical confidence.

Substantial differences were also identified in clinical practices. Dental practitioners were significantly more likely to screen patients for OSF (75% vs 40%, p<0.001), obtain habit histories related to areca nut and tobacco use (90% vs 65%, p<0.001), provide counseling regarding cessation of harmful habits (85% vs 60%, p=0.002), refer suspected cases appropriately (70% vs 55%, p=0.03), and perform follow-up evaluations (65% vs 40%, p=0.001). These findings are consistent with other studies who reported that dentists routinely engage in preventive oral health practices and are more likely to identify potentially malignant oral disorders at earlier stages.[10,14] These practices are critical in facilitating early diagnosis and disease progression.[15] On the contrary, medical practitioners reported relatively lower levels of involvement in such activities, which might result in opportunities for early diagnosis being lost.[16,17]

One major advantage of this study was the inclusion of an educational intervention component, which yielded positive results,[18] and the exposure to a brief educational brochure, significantly improved the mean knowledge scores in both groups.[19] Among medical practitioners, the mean knowledge score increased from 5.8±2.1 to 8.5±1.5, representing an absolute improvement of 2.7 points (46.6%), whereas dental practitioners showed an increase from 7.5±1.8 to 9.2±1.0, corresponding to a 1.7-point improvement (22.7%). Both improvements were statistically significant (p<0.001). Notably, medical practitioners reported relatively higher improvements, which might be attributed to their relatively lower knowledge and greater capacity for learning.[20]

Findings showed a significant change in knowledge level from poor and moderate to good after the intervention program. This emphasizes the significance of educational materials in shaping knowledge levels.[21] Nevertheless, it is noteworthy that the analysis of knowledge level after the intervention was conducted immediately after the subjects read the brochures and thus can only reflect a short-term effect of the educational materials on the subjects' knowledge level. Long-term knowledge level and the translation of knowledge into practice are areas of further study.[22]

The study's findings are significant in the clinical and public health areas. Considering the high incidence of areca nut use and the potential risk of developing OSF among the population, it is of utmost importance to improve the knowledge level of clinicians to facilitate early detection and prevent the progression of the disease to a malignant form. This can be achieved by incorporating oral health into medical courses and arranging regular workshops and conferences among medical and dental professionals.

LIMITATIONS OF STUDY

Despite its advantages, this study has some limitations. The convenience method of sampling might limit the generalizability of this study. In addition, this study may be subject to self-reporting biases. The post-intervention analysis may not provide information regarding long-term knowledge retention. Future studies should focus on longitudinal designs to assess long term impact and include objective measures of clinical practice.

CONCLUSION

The study identified significant gaps in knowledge and clinical practices among medical practitioners compared to dental practitioners regarding oral sub mucous fibrosis. The educational intervention proved effective in improving knowledge in both groups, particularly among medical practitioners. These findings highlight the need for targeted educational strategies and interdisciplinary efforts to enhance early detection and management of OSF, ultimately improving patient outcomes.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

HSB & ASA: Data acquisition, analysis, critical review, and final approval.

MAK & BD: Study design, data interpretation, manuscript drafting, critical review, and final approval.

UK & SNI: Concept, Data analysis, manuscript drafting, and final approval.

All authors are accountable for ensuring the work's accuracy and integrity, and they have agreed to appropriately investigate and resolve any related questions before publication.

REFERENCES

1. You J-R, Chen Y-T, Hsieh C-Y, Chen S-Y, Lin T-Y, Shih J-S, et al. Exploring possible diagnostic precancerous biomarkers for oral submucous fibrosis: a narrative review. Cancers 2023; 15(19): 4812. http://doi.org/10.3390/cancers15194812
2. Sowmya S, Sangavi R. Prevalence of oral submucous fibrosis with other oral potentially malignant disorders: a clinical retrospective study. Cureus 2023; 15(11): e49277. http://doi:10.7759/cureus.49277
3. Kazemi K, Fadl A, Sperandio FF, Leask A. The Areca Nut and Oral Submucosal Fibrosis: A Narrative Review. Dent J 2025; 13(1): 12. http://doi.org/10.3390/dj13010012
4. Cai X, Huang J. Clinicopathological factors associated with progression of oral submucous fibrosis: A population-based retrospective study. Oral Oncol 2022; 130: 105949. http://doi.org/10.1016/j.oraloncology.2022.105949
5. Wei DH, Liu C, Jian DX, Li P, Yanli L. Guideline for the diagnosis and clinical management of oral submucous fibrosis. Chin J Dent Res 2023; 26(4): 271-285. http://doi.org/10.3290/j.cjdr.b4140415
6. Alshayeb MA, Mathew A, Varma SR, Elkaseh A, Kuduruthullah S, Ashekhi A, et al. Prevalence and distribution of oral mucosal lesions associated with tobacco use in patients visiting a dental school in Ajman. J Int Soc Prev Community Dent. 2019; 9(3): 275-281. http://doi.org/10.4103/jispcd.JISPCD_489_18
7. Arora S, Squier CA. Areca nut trade, globalisation and its health impact: perspectives from India and South-east Asia. Perspect Public Health 2019; 139(1): 44-48. http://doi.org/10.1177/1757913918792584
8. Liu Y, He M, Yin T, Zheng Z, Fang C, Peng S. Prevalence of recurrent aphthous stomatitis, oral submucosal fibrosis and oral leukoplakia in doctor/nurse and police officer population. BMC Oral Health 2022; 22(1): 353. http://doi.org/10.1186/s12903-022-02454-1
9. Chhabra AK, Sune R, Reche A. Oral Submucous Fibrosis: A Review of the Current Concepts in Management. Cureus 2023; 15(10): e47259. http://doi.org/ doi: 10.7759/cureus.47259
10. Prakash S, Bharti S, Sonal S, Sinha S, Priya S, Verma S. Practice, attitude, and knowledge of dental practitioners towards oral submucous fibrosis: A clinical study. Int J Health Sci 2022; 6(S3): 1900-1906. https://doi.org/10.53730/ijhs.v6nS3.5877
11. Bhattacharya A. Knowledge of dental graduate students on management options for oral submucous fibrosis-An original research. J Adv Med Dent Sci Res 2021; 9(5).
12. Gupta A, Singh H, Poudya S. Knowledge, awareness and practice regarding oral cancer among undergraduate students and interns in a dental hospital. J Chitwan Med Coll 2023; 13(3): 66-71. https://doi.org/10.54530/jcmc.1414
13. Al-Tabbaa N, Badr S, Abd-Elmoniem H. The Degree of Knowledge and Attitude of Egyptian Physicians Regarding Emergency Treatment of Traumatic Dental Injuries: Cross Sectional Study. Bull Stomatol Maxillofac Surg 2025; 21(12). http://doi.org/10.58240/1829006X-2025.21.12-90
14. Dutt P, Pushpad R, Jaiswal N, Porel S, Das SK, Erraguntala H. Knowledge, Awareness, and Practices Regarding Oral Cancer Screening Among General Dentists: A Cross-Sectional Study. Acad J Med 2026; 9(1): 43-47. https://doi.org/10.48165/ajm.2026.9.01.11
15. Dadgal KV, Panchbhai A, Mohod SC, Lohe VK, Patel S. Comparative evaluation of efficacy of a smartphone application for oral submucous fibrosis (OSMF) self-examination in follow-up of the patients compared to routine Outpatient Department-based follow-up: a clinical interventional study. F1000Res 2025; 13: 165. https://doi.org/10.12688/f1000research.133893.2
16. Doshi M, Patel JK. Putting the mouth back into the body. Br J Hospital Med 2017; 78 5: 244-245. https://doi.org/10.12968/hmed.2017.78.5.244
17. Morgan R, Tsang J, Harrington N, Fook L. Survey of hospital doctors' attitudes and knowledge of oral conditions in older patients. Postgrad Med J 2001; 77(908): 392-394. http://doi.org/10.1136/pmj.77.908.392
18. Braun LW, Martins MAT, Romanini J, Rados PV, Martins MD, Carrard VC. Continuing education activities improve dentists' self-efficacy to manage oral mucosal lesions and oral cancer. Eur J Dent Educ 2021; 25(1): 28-34. http://doi.org/ 10.1111/eje.12574
19. Ahuja NA, Kedia SK, Ward KD, Pichon LC, Chen W, Dillon PJ, Navaparia H. Effectiveness of Interventions to Improve Oral Cancer Knowledge: a Systematic Review. J Cancer Educ 2022; 37(3): 479-498. http://doi.org/ 10.1007/s13187-021-01963-x
20. Almazrooa SA, Binmadi NO. The knowledge and attitude of physicians' toward the oral medicine specialty. J Oral Maxillofac Surg Med Pathol 2021; 33(1): 83-88. http://doi.org/:10.1016/j.ajoms.2020.07.014
21. Coppola N, Mignogna MD, Rivieccio I, Blasi A, Bizzoca ME, Sorrentino R, et al. Current knowledge, attitudes, and practice among health care providers in OSCC awareness: systematic review and meta-analysis. Int J Environ Res Public Health 2021; 18(9): 4506. https://doi.org/10.3390/ijerph18094506
22. Hill J, Gratton N, Kulkarni A, Hamer O, Harrison J, Harris C, et al. The effectiveness of evidence-based healthcare educational interventions on healthcare professionals' knowledge, skills, attitudes, professional practice and healthcare outcomes: Systematic review and meta-analysis. J Eval Clin Pract 2024; 30(6): 909-935. http://doi.org/10.1111/jep.14001