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Prevalence and Distribution of Oral Mucosal Lesions in Dental Students of North Karnataka

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INTRODUCTION

Oral mucosal lesion (OML) is known as any abnormal alteration in color, surface aspect, swelling, or loss of integrity of the oral mucosal surface. Although a proportion of OMLs are benign and require no active treatment, some may present with significant pathology. Of particular importance are oral potentially malignant disorders which may progress into malignancy. Besides, OMLs can interfere with daily quality of life in affected patients through impacts on mastication, swallowing, and speech with symptoms of burning, irritation, and pain [1]. OMLs have many etiologies as bacterial or viral or fungal infections, local trauma or irritation, systemic diseases, and excessive consumption of tobacco, betel quid, and alcohol [1,2]

In recent years, public and health professionals have become more aware of the importance of oral mucosal lesions (OML). Apart from evaluation of oral health for dental caries and periodontal diseases, the need for epidemiologic study of oral cancer and other oral mucosal conditions (especially related to human immunodeficiency virus (HIV) or hepatitis-B virus (HBV) infections and and covid infection is also being emphasized.

Epidemiologic studies provide important information for the understanding of the prevalence, incidence, and severity of oral disease in a specific population. It is important to understand the distribution, etiology, risk factors, and pathogenesis of OML. This presents an opportunity for a timely primary prevention, early diagnosis, and prompt treatment.

Although the terms dental health and oral health are used almost synonymously when stating the goals for oral health, such statements are usually valid only for dental health. This may lead to severe underestimation of the need for total oral health care. When planning measures for improving oral health, the lack of data may lead to a risk of overlooking diseases of the soft tissues in, and adjacent to, the oral cavity.[3]

Prevalence data of oral mucosal lesions are available from many countries, but the information is usually restricted to very few lesions in each survey. Only two studies with sufficiently large number of individuals, have presented data on a broad spectrum of oral mucosal lesions in a general population.[3,4,5]

A broad range of OML has received interest for epidemiologic studies worldwide, but few studies have documented the entire range of possible lesions. Although in 1980, the World Health Organization (WHO)'s "Guide to epidemiology and diagnosis of oral mucosal disease and conditions"[6] provided a systemic approach of data collection, the epidemiologic literature on oral mucosal diseases is somewhat scanty in this country. Cancer has always been a challenge to medical science with the continuing global increase of cases. Cases of oral cancer have increased considerably with almost 263,900 new cases and 128,000 deaths reported worldwide in 2006 [7] Shankaranarayan *et al*.[8] revealed that India has one of the highest rates of oral cancer varying from over 20 per 100,000 people as compared with 10 per 100,000 in USA and less than 2 per 100,000 in the Middle East. Oral cancer accounts for almost 30% of all cancers in India[9].

Adolescents and young adults constitute a complex group in continuous biological & emotional changes, which may present various types of alterations involving the Orofacial regions. Epidemiological studies can provide an important vision for understanding the prevalence, extent and severity of oral disease in population. There are relatively few systematic studies of the prevalence of such lesions in children & youth[10].

Adolescents and young adults may be particularly susceptible to exposures to oral carcinogens. In young adults, also of importance are various soft tissue lesions of the oromaxillofacial area, indicating a wide variety of local and systemic disorders, thus stressing the importance of correct diagnosis and prompt treatment of oral lesions.[10]

Till now, in India, very little epidemiologic research has been conducted into oral mucosal disorder focusing only the adolescents, though many studies have been conducted in a wide age range group concentrating more on the old adults. There is no data available on the prevalence of oral lesions among age group population of 15-30+years dental students in North Karnataka of Kalaburagi district with an emphasis on prevalence of oral lesions in covid positive dental students.

This epidemiological study is an effort to study the oral mucosal lesions in this distinct population with particular interest towards today's adolescent's future.

OBJECTIVES

1. To determine the prevalence of OML among dental students of North Karnataka
2. To determine the prevalence of OML in covid positive dental students of North Karnataka
3. To provide a system standard approach, using the WHO guidelines for the collection and report of data for OML and other conditions, and assign different codes of treatment.

METHODOLOGY

A total of 360 dental students will be evaluated from the dental colleges in Kalaburagi North Karnataka. The study will be conducted on students between 18 and 30+ years, from the Department of Oral Medicine and Radiology, Al Badar dental college and hospital, Kalaburagi, India and HKEs S.N Institute of dental sciences and Research

Inclusion criteria

Dental students between 18 and 30+ years of age

Exclusion criteria

Students who refuse examination, students with trismus who cannot open their mouths adequately for intraoral examination, unconscious or sedated, recent history of maxillofacial trauma, postsurgical cases, undergoing orofacial radiation therapy, or intermaxillary fixation treatment, during the study period will be excluded from the study

The study is approved by the Institutional ethical committee of Al Badar dental college and hospital after the consent from the Principal and students. Both males and females were included in the study.

The subjects were assigned to groups according to gender, age, habit of tobacco use (cigarette/bidi smoking and smokeless tobacco), and the use of dental prosthesis.

A standardized extraoral and intraoral examination will be performed by 3 trained examiners who were provided with pictorial manuals in accordance with the WHO guidelines[6]. The reliability of the examiners is calculated approximately 80%–85% ($\kappa = 0.82$) using Kappa statistics, resulting in a high degree of agreement among the examiners beyond chance.

Examinations were performed in a setting that had a fully reclining dental chair, diagnostic instruments, direct and indirect light, gauze, disposable gloves, mouth masks, drape, illuminated mouth mirrors with disposable tops, straight and curved probes, tweezers, containers (one for sterilized instruments and another for used ones), surgi-scrub, concentrated sterilizing solution (Dettol), hand towels, proforma, and consent form.

The diagnostic criteria for OML was in accordance with WHO criteria of 1980[6]. For other lesions mucosal variants criteria described by Axell *et al*[11] was used. For the mucosa of betel chewers, Riechert *et al* [12] work was referred. A concise description of the main clinical features of each condition was given using the ICD-DA classification in the manual[13]. Standardized topography of the oral cavity with associated definitions of the boundaries and structures was adopted for the examination and recording[14].

To arrive at a diagnostic criterion, the Kleinman *et al*[15].guidelines on the methodology in epidemiologic studies and colored atlas was referred.

Findings were recorded with help of an assistant. Intra oral photographs were taken using digital camera to support the findings. History and lesions were recorded in a specially designed case history format.

Statistical Analysis

The collected data will be entered into the computer, and frequency tables will be generated using Statistical Package for the Social Sciences latest version. Chi-square test will be used to determine the association of age, gender, use of dentures, use of tobacco with oral mucosal disorders, various mucosal variants, and treatment required. The level of significance will be set at (P<0.001) throughout the study. Kappa statistics (κ) was determined using standard formulae to measure the correlation for degree of agreement among the examiners beyond chance.

RESULTS

A total of 360 responses were recorded from the dental students between 18 and 30+ years of age to determine the prevalence of OML among dental students and to determine the prevalence of OML in covid positive dental students of North Karnataka. It also helps to provide a system standard approach, using the WHO guidelines for the collection and report of data for OML and other conditions, and assign different codes of treatment. The data obtained was tabulated for mean & SD then subjected to chi-square & kappa test for statistical analysis. The level of significance was set at (P<0.001) throughout the study.

The maximum number of responses were recorded for the age group of 20-25 years with the percentage of 79.11% (Table 1, Graph 1). The demographic analysis revealed 72(20.06%) were males and 287(79.94%) were females aged between 18-30+years with mean age of 21.48 years with ±2.39 years of standard deviation (Table 2, Graph 2).

Among the total 359 students, 57 (15.8%) were from 1st year, 71 (19.8%) were from 2nd year, 59 (16.43%) were from 3nd year, 86 (23.9%) were from 4th year, 62 (17.27%) were from PG 1st year, 6 (1.67%) were from PG 2nd year, 18 (5%) were interns. (Table 3, Graph 3).

The chief complaint of 11.98% of patients was for periodontal checkup followed by restorative dentistry (11.42% each), to allergy (8.91%), esthetics (4.18%), Prosthesis (2.51%), Pain (1.67%), only 0.28% consulted for Masticatory pain as demonstrated in Table 4, Graph 4

The patients' medical history revealed the presence of covid in 6.41% of cases, history of surgeries in 1.67%, asthma in 1.11% and 0.28% of cases had history of various medications (Table 5, Graph 5 (a), Graph 5 (b).

Following the intraoral and extraoral examination, different pathologies were noted (Table 6), Graph 6 (a), Graph 6 (b) Graph 6 (c), Graph 6 (d). The most common lesion was angular cheilitis (11.98%), followed by aphthous ulcers (11.14%), dry mouth (4.73%), Linea alba (3.62%), tongue thrusting (3.34%), fissured tongue (3.06%), geographic tongue (2.79%), leukoplakia (2.51%), tori (1.95%), mouth breathing (1.67%), impression of teeth on oral mucosa (1.67%), nail biting (0.84%), lichen planus (0.56%), melanotic macule (0.28%), leukoedema (0.28%). In majority of the cases, only one lesion was found however, some patients exhibited more than one oral lesion simultaneously.

As shown in Table 7, Graph 7 the prevalence of extraoral and intraoral lesions did not significantly differ between males and females except for tori which were more frequent among males (1.2%) than females (0.8%) (p=0.0342). Intraoral lesions that were more frequent among females are tongue thrusting (2.8%), mouth breathing (1.6%), nail biting (0.8%), melanotic macule (0.2%), linea alba (2.8%), fissured tongue (2.8%), dry mouth (3.4%), leukoedema (0.2%), impression of teeth on oral mucosa (1.4%), leukoplakia (1.9%), aphthous ulcers (8.9%), geographic tongue (1.6%), and lastly angular cheilitis (8.6%).

The level of significance was found to be statistically significant in thumb sucking, candidiasis, tobacco keratosis, tongue depapillation, traumatic fibroma, Fordyce's granules, petechiae/hemangioma, ankyloglossia, stomatitis under prosthesis, cranulated tongue, mucocele, fistula, tori, lingual varicosity, oral submucous fibrosis, nicotiana palati, leukoedema, hairy tongue.

Kappa statistics (κ) was determined using standard formulae to measure the correlation for degree of agreement among the examiners. (Table 8)

The observation for Fissured tongue, Dry Mouth, Leukoplakia, Impression of Teeth on Oral Mucosa, Aphthous Ulcers, Geographic tongue and Angular Cheilitis was almost perfect.

The observations for lichen Planus were in substantial agreement between all observers.

DISCUSSION

This study was aimed to determine the prevalence of OML among dental students and covid positive dental students of North Karnataka. This study also aimed to provide a system standard approach, using the WHO guidelines for the collection and report of data for OML and other conditions, and assign different codes of treatment. it is very essential to understand the prevalence, distribution, and risk factors of OMLs to promote primary prevention, early diagnosis, prompt treatment, and the provision of appropriate health services. The current study was attempted to study the same in the subjects which were assigned groups according to gender, age, habit of tobacco use (cigarette/bidi smoking and smokeless tobacco), and the use of dental prosthesis.

The diagnostic criteria for OML was in accordance with WHO criteria of 1980[6]. For other lesions mucosal variants criteria described by Axell *et al*[11] was used. For the mucosa of betel chewers, Riechert *et al* [12]work was referred. A concise description of the main clinical features of each condition was given using the ICD-DA classification in the manual[13]. Standardized topography of the oral cavity with associated definitions of the boundaries and structures was adopted for the examination and recording[14]. To arrive at a diagnostic criterion, the Kleinman *et al*[15].guidelines on the methodology in epidemiologic studies and colored atlas were referred.

It has been reported that OMLs may affect 4.9% to 64.7% of individuals having various habits, depending on the population studied [1,3,18-20]. In our study the overall prevalence of OMLs was found to be 50.42%. These lesions were mostly associated with periodontal diseases, restorative treatments, allergies, esthetics and prosthesis. This can be due to the selection of younger age group. The overall prevalence of OMLs was found to be higher in older individuals than younger individuals, and it can be related to different habits acquired with age. [1]

In our study, 6.41% of the students had the history of being covid positive. None of the subjects had any habit of cigarette smoking and tobacco chewing in any form. Therefore the risk for any potentially malignant and oral cancers was zero. Consistently, previous study[20] observed an increased prevalence of OMLs among smokers and drinkers than in individuals without such habits, especially in potentially malignant disorders.

In our study, females subjects were more than males, therefore most of the oral lesions were present in females but the difference in prevalence of OML's was not statistically significant. According to a previous study, oral lesions affected 64.5% of males and only 59.8% of females.[1]

In this study, the most common lesion was angular chelitis (11.98%), followed by apthous ulcers (11.14%), dry mouth (4.73%), linea alba (3.62%), tongue thrusting (3.34%), fissured tongue (3.06%), geographic tongue (2.79%), leukoplakia (2.51%), tori (1.95%), mouth breathing (1.67%), impression of teeth on oral mucosa (1.67%), nail biting (0.84%), lichen planus (0.56%), melanotic macule (0.28%), leukoderma (0.28%).

According to a previous study[1], the most common lesions were coated tongue with (17.4%) and melanotic macule (11.2%), gingivitis (9.6%), linea alba (6.2%), tongue depapillation (5.1), smoking keratosis (5.1), traumatic fibroma (4.5), frictional keratosis (3.9%), fissured tongue (3.9%), hemangiomas (3.9%), and Fordyce granules (3.9%).

In a study conducted by AL Mathew et al[3], the most prevalent normal variant was Fordyce's granules (6.55%), followed by fissured tongue (5.71%), Leukoedema (3.78%), and varices (1.17%). The most prevalent lesion was frictional keratosis (5.79%), followed by smoker's palate (2.77%), aphthous stomatitis (2.1%), oral submucous fibrosis (2.01%), oral malignancies (1.76%), leukoplakia (1.59%), median rhomboid glossitis (1.5%), oral candidiasis (1.3%), lichen planus (1.26%), traumatic ulcer (1.01%), denture stomatitis (0.84%), geographic tongue (0.84%), betel chewers mucosa (0.84%), irritational fibroma (0.84%), angular cheilitis (0.58%), herpes labialis (0.58%), and mucocele (0.16%).

The prevalence of each OML varied from study to other as shown above because with age many alterations of the oral mucosal lesion can be induced. Also, the selection of the population can affect the prevalence of oral lesions. To compare two populations, they must have the same percentage of habits, mean age, and the same distribution of individuals following the age group.[1]

In the present study the occurrence and distribution of systemic diseases are, history of surgeries in 1.67%, asthma in 1.11% and 0.28% of cases had history of various medications. In a previous study,[1] 7.3% were hypertensive, 2.2% hypercholesterolemic, 5.6% diabetic, and 14% allergic.

Our study is limited by the information and classification biases which might exist and results cannot be generalized. OMLs are mostly avoidable and can be controlled through education and measures targeted to both the general population and to dental practitioner.

CONCLUSION

The result of the present study provides some information on the prevalence of OML's in the students of Al Badar dental college and hospital, Kalaburagi, India. Habituated patients were advised to give up harmful habits and patients with any systemic diseases were advised for treatment from General Physician. Systemic diseases and drugs can be related to oral mucosal lesions prevalence. The prevalence of oral mucosal lesions varied widely among populations and studies. All patients were individually counseled about their oral and dental needs and awareness about the adverse effects of OML's was also given.

Clinical Significance

1. Early diagnosis is the most important single factor in combating oral cancer and improving survival rate
2. The study focused on importance of various soft tissue lesions of the oromaxillofacial area, indicating a wide variety of local and systemic disorders, thus stressing the importance of correct diagnosis and prompt treatment of oral lesions.
3. An important parameter for evaluating the oral health of any population is the prevalence data of OML, which is also vital for planning the oral health care services.
4. The subjects were assigned to the groups according to the required treatment. This study not only recognized groups in urgent need of treatment, but also emphasizes the current trends of treatment given to
5. Advice and encouragement to students was done to quit the use of tobacco.
6. This study encouraged oral health administrators to follow standard methods for evaluating the prevalence of oral lesions according to WHO guidelines in order to maintain uniformity in epidemiologic studies.

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Table 1: Distribution of responses according to Age (in years)

Age (in Years)	Number	Percentage
15-20	48	13.37
20-25	284	79.11
25-30	22	6.13
Above 30	05	1.39
Total	359	100
Mean±SD	21.48±2.39	

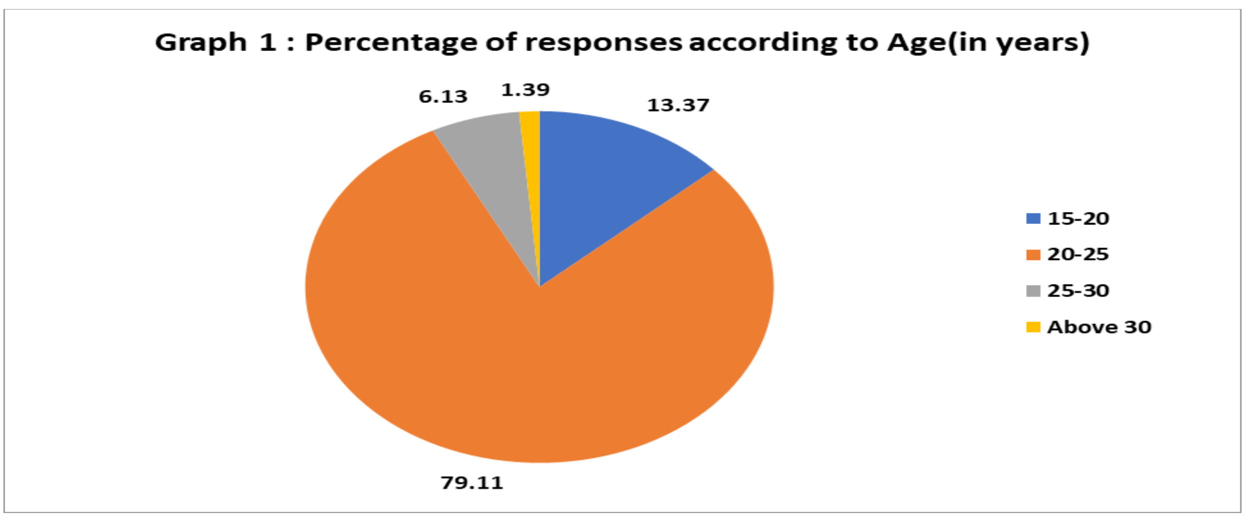


Table 2: Distribution of responses according to Gender

Gender	Number	Percentage
Male	72	20.06
Female	287	79.94
Total	359	100

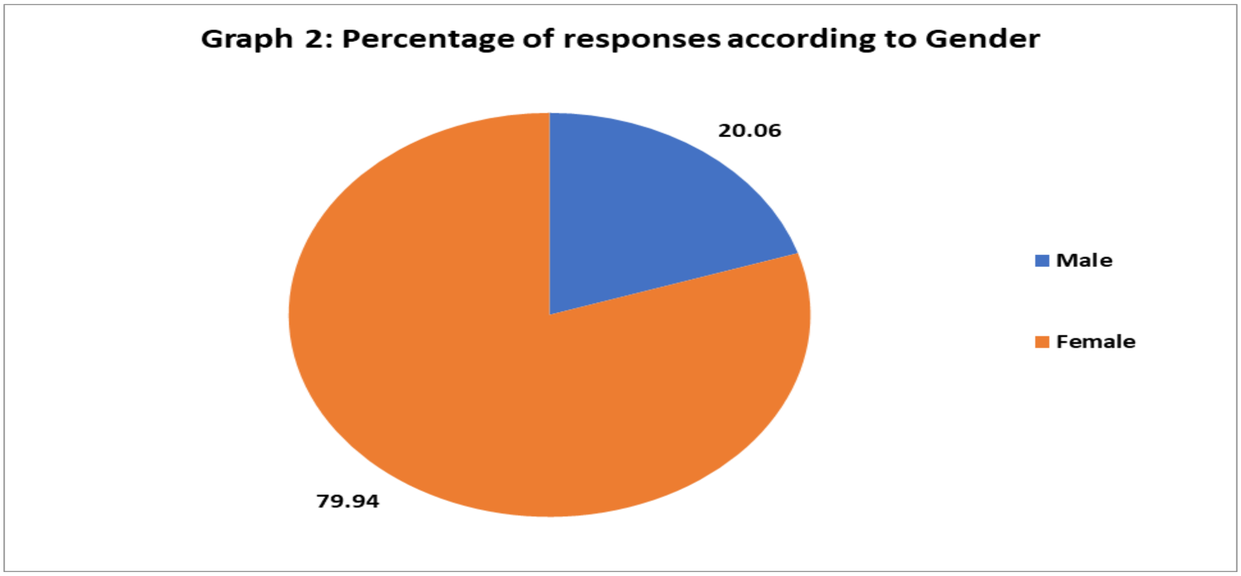


Table 3: Distribution of responses according to Year of study

Year of study	Number	Percentage
1st Year	57	15.88
2nd Year	71	19.78
3rd Year	59	16.43
4th Year	86	23.96
PG 1st Year	62	17.27
PG 2nd Year	06	1.67
Intern	18	5.01
Total	359	100

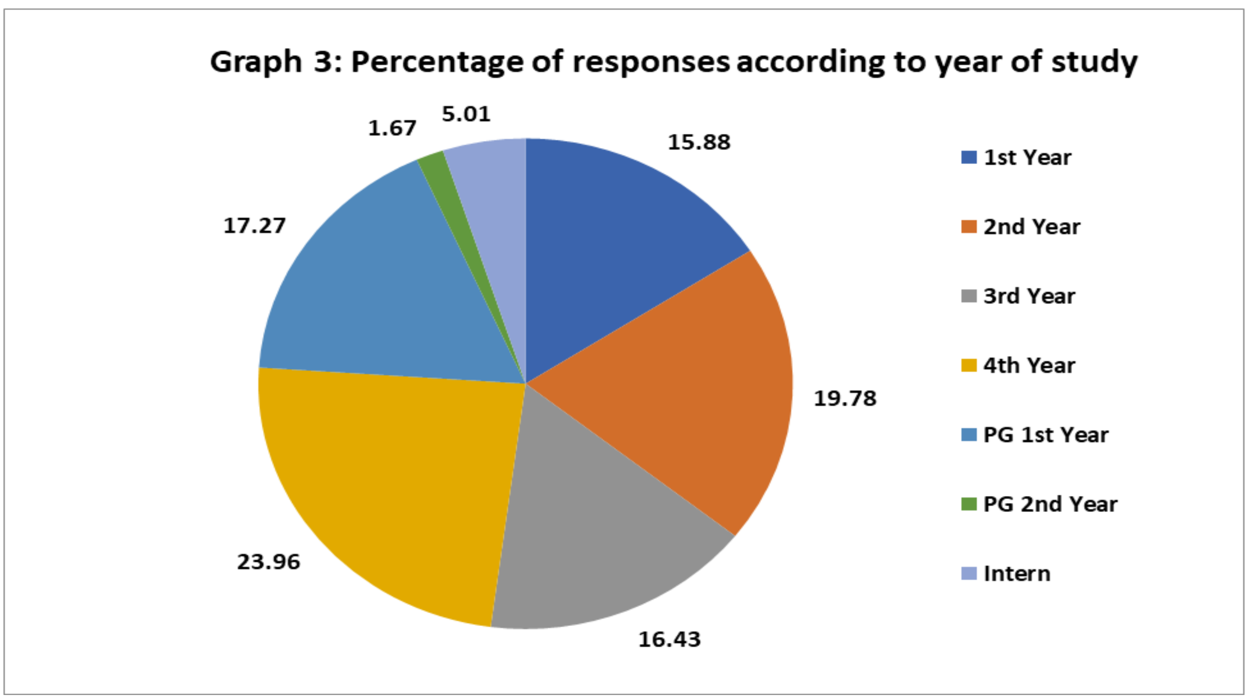


Table 4: Distribution of responses according to Patient's chief complaint

Patient's chief complaint	No		Yes	
	Number	Percentage	Number	Percentage
Pain	353	98.33	06	1.67
Restoration	318	88.58	40	11.42
Esthetics	344	95.82	15	4.18
Masticatory pain	358	99.72	01	0.28
Periodontal checkup	316	88.02	43	11.98
Prosthesis	350	97.49	09	2.51
Allergy	327	91.09	32	8.91

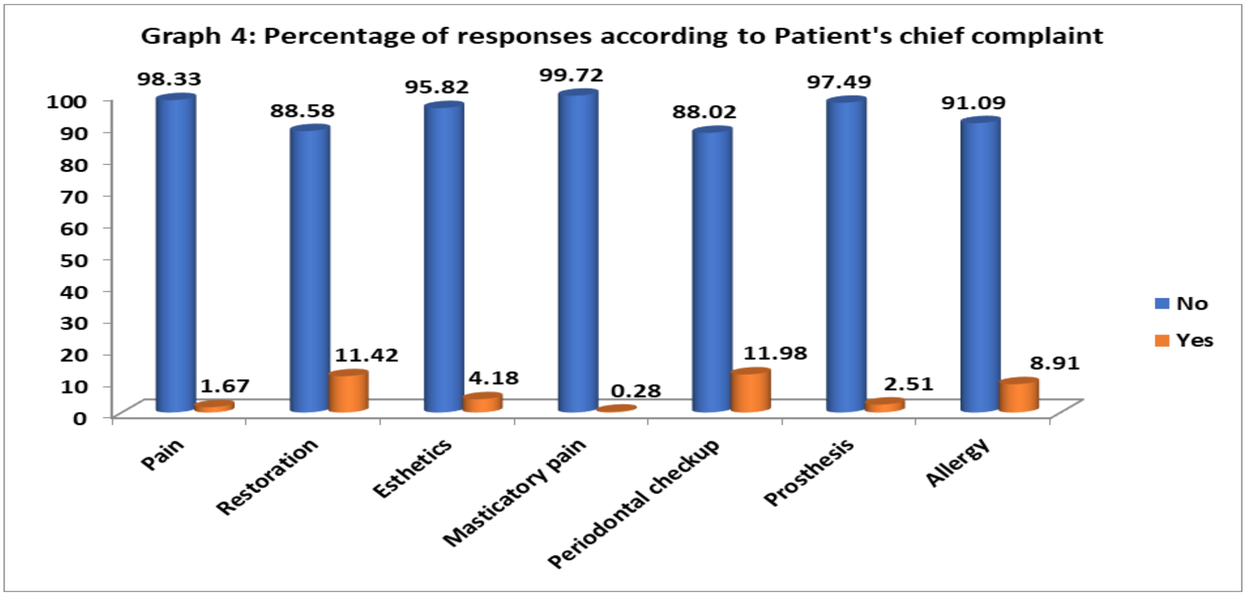
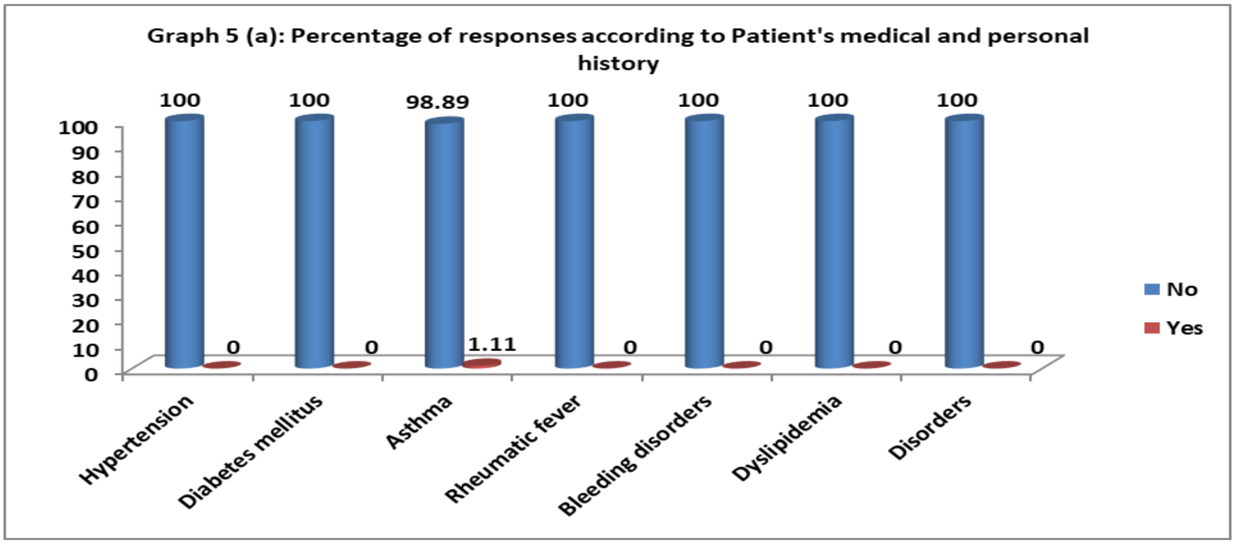


Table 5: Distribution of responses according to Patient's medical and personal history

Patient's medical and personal history	No		Yes	
	Number	Percentage	Number	Percentage
Hypertension	359	100	00	00
Diabetes mellitus	359	100	00	00
Asthma	355	98.89	04	1.11
Rheumatic fever	359	100	00	00
Bleeding disorders	359	100	00	00
Dyslipidemia	359	100	00	00
GIT Disorders	359	100	00	00
Thyroid disorders	359	100	00	00
Covid	336	93.59	23	6.41
Medications/drugs	358	99.72	01	0.28
Surgery history	353	98.33	06	1.67
Guthka	359	100	00	00
Tobacco	359	100	00	00
Smoking	359	100	00	00
Alcohol	359	100	00	00



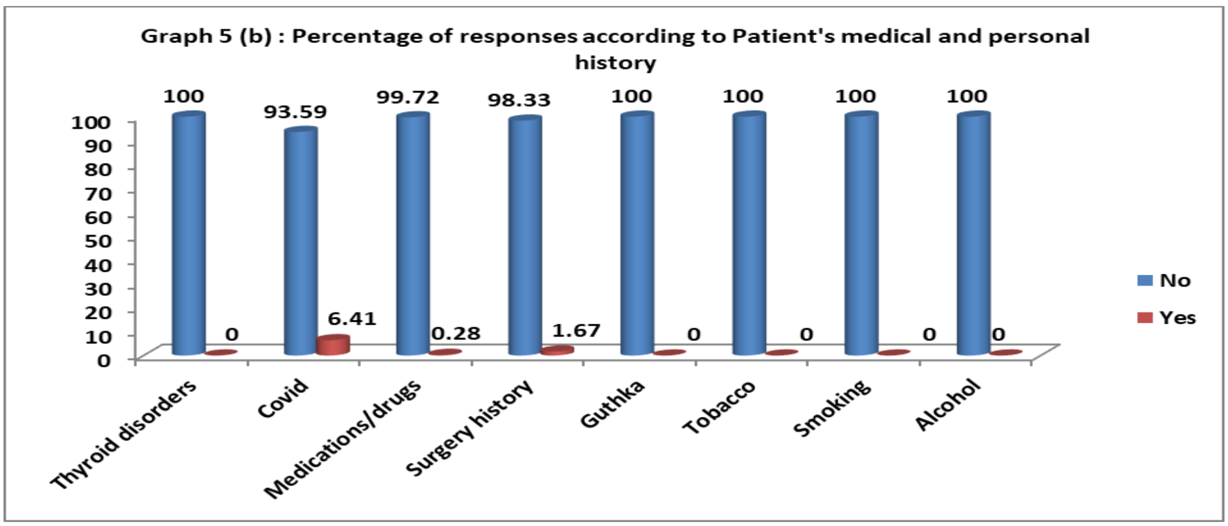
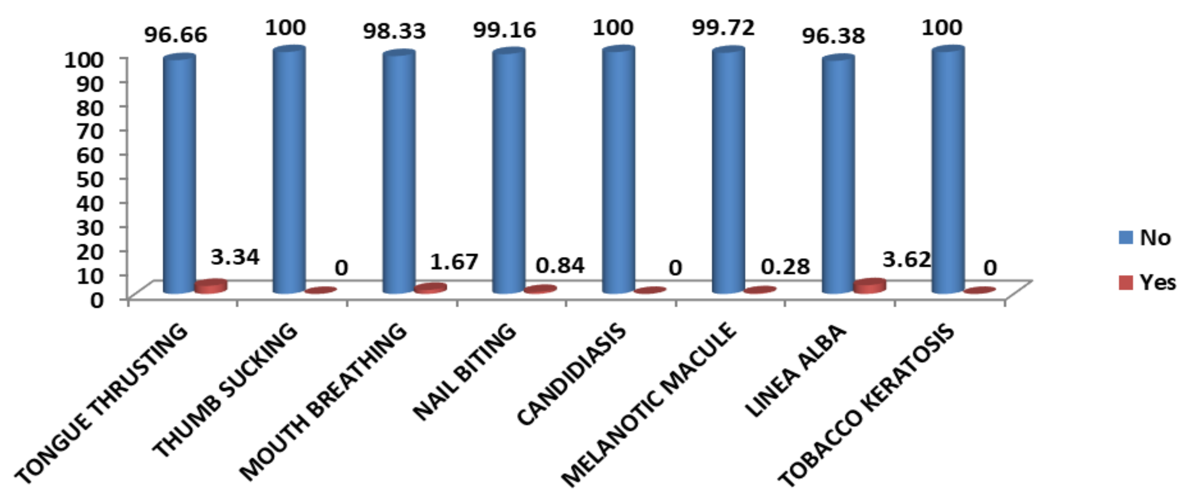


Table 6: Distribution of responses according to Lesion findings on intraoral and extraoral examination

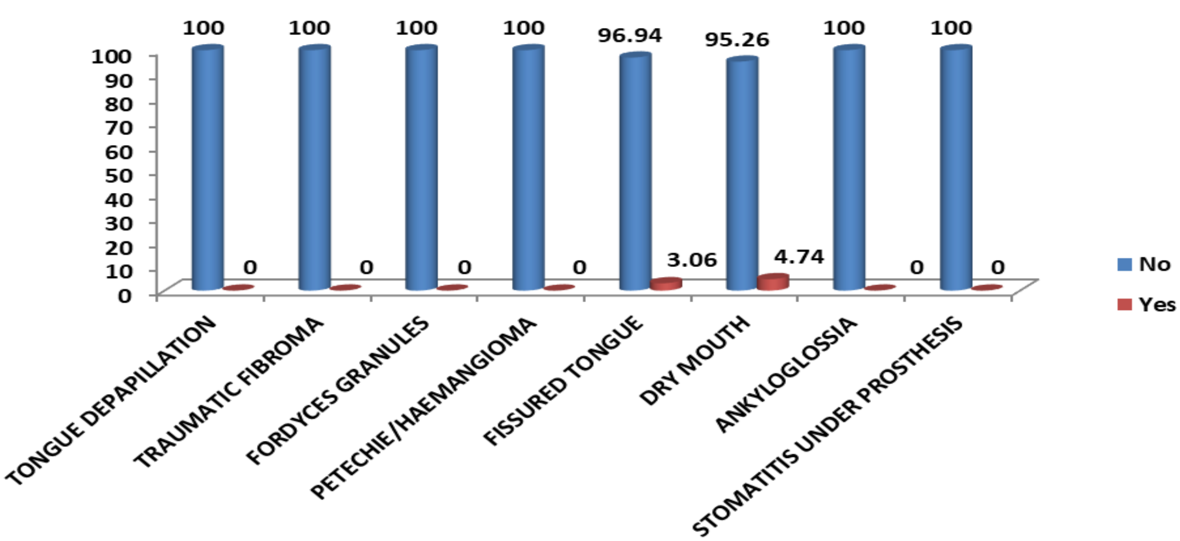
Lesion findings on intraoral and extraoral examination	No		Yes	
	Number	Percentage	Number	Percentage
TONGUE THRUSTING	347	96.66	12	3.34
THUMB SUCKING	359	100	00	00
MOUTH BREATHING	353	98.33	06	1.67
NAIL BITING	356	99.16	03	0.84
CANDIDIASIS	359	100	00	00
MELANOTIC MACULE	358	99.72	01	0.28
LINEA ALBA	346	96.38	13	3.62
TOBACCO KERATOSIS	359	100	00	00
TONGUE DEPAPILLATION	359	100	00	00
TRAUMATIC FIBROMA	359	100	00	00
FORDYCES GRANULES	359	100	00	00
PETECHIE/HAEMANGIOMA	359	100	00	00
FISSURED TONGUE	348	96.94	11	3.06
DRY MOUTH	342	95.26	17	4.73
ANKYLOGLOSSIA	359	100	00	00
STOMATITIS UNDER PROSTHESIS	359	100	00	00
LEUKODERMA	358	99.72	01	0.28
CRANULATED TONGUE	359	100	00	00
MUCOCEOL	359	100	00	00
FISTULA	359	100	00	00
TORI	352	98.05	07	1.95

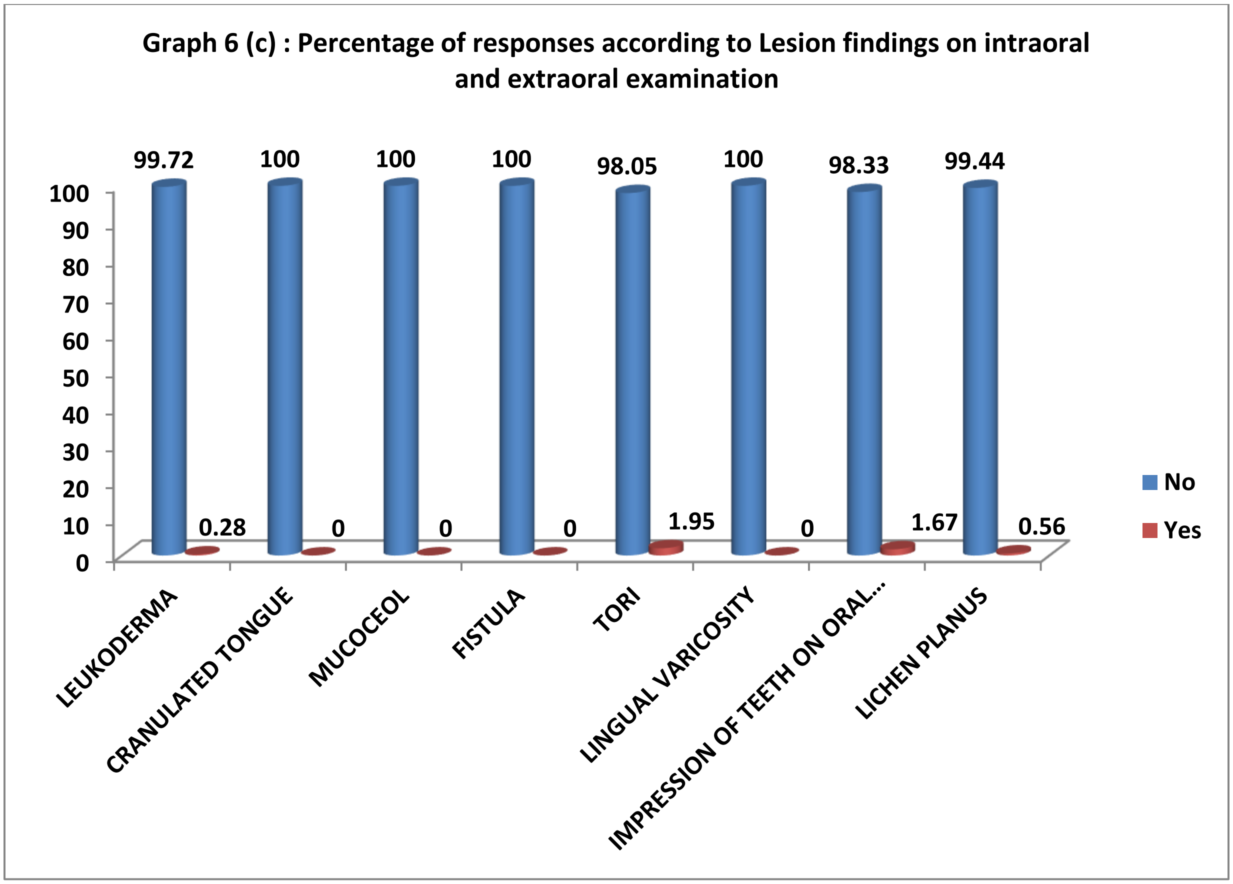
LINGUAL VARICOSITY	359	100	00	00
IMPRESSION OF TEETH ON ORAL MUCOSA	353	98.33	06	1.67
LICHEN PLANUS	357	99.44	02	0.56
LEUKOPLAKIA	350	97.49	09	2.51
ORALSUBMUCOUS FIBROSIS	359	100	00	00
NICOTINA PALATI	359	100	00	00
LEUKOEDEMA	359	100	00	00
APTHOUS ULCERS	319	88.86	40	11.14
GEOGRAPHIC TONGUE	349	97.21	10	2.79
HAIRY TONGUE	359	100	00	00
ANGULAR CHEILITIS	316	88.02	43	11.98

Graph 6 (a) : Percentage of responses according to Lesion findings on intraoral and extraoral examination



Graph 6 (b)Percentage of responses according to Lesion findings on intraoral and extraoral examination




Graph 6 (c) : Percentage of responses according to Lesion findings on intraoral and extraoral examination
99.72
100
100
100
98.05
100
98.33
99.44
0.28
0
0
0
1.95
0
1.67
0.56
100
90
80
70
60
50
40
30
20
10
0
No
Yes
LEUKODERMA
CRANULATED TONGUE
MUCOCEOL
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IMPRESSION OF TEETH ON ORAL...
LICHEN PLANUS

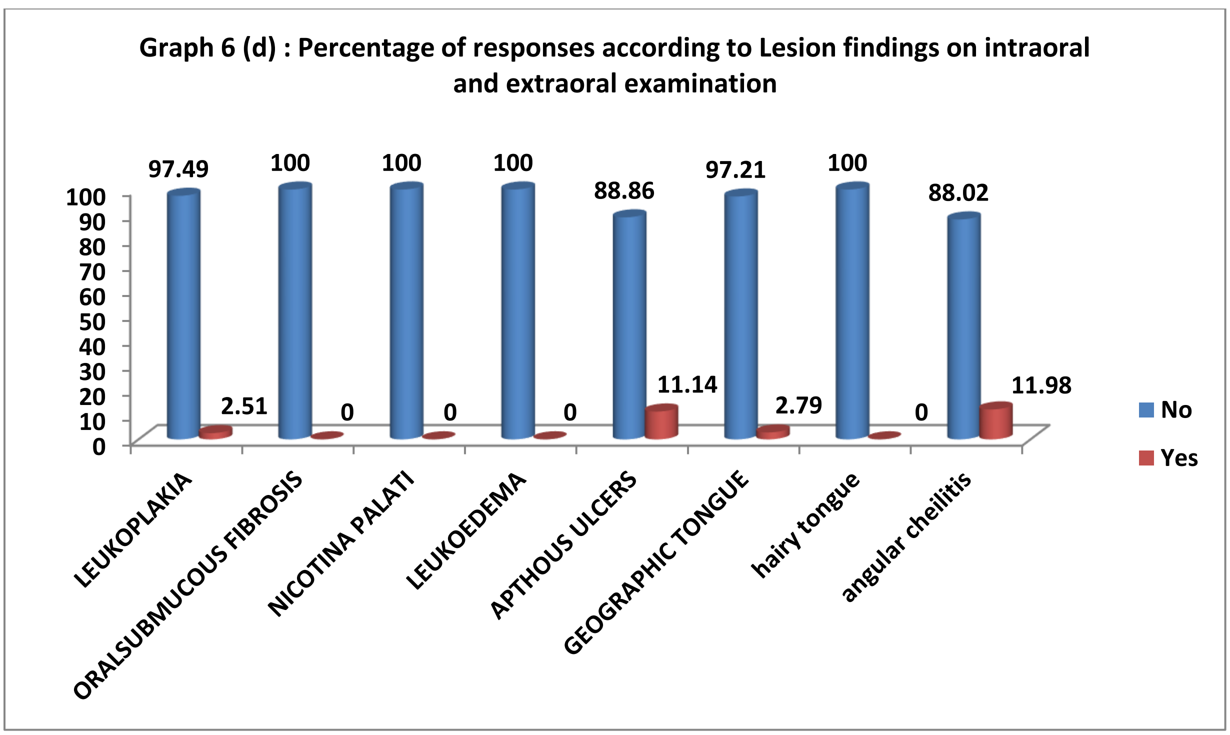
Graph 6 (d) : Percentage of responses according to Lesion findings on intraoral and extraoral examination
97.49
100
100
100
88.86
97.21
100
88.02
2.51
0
0
0
11.14
2.79
0
11.98
100
90
80
70
60
50
40
30
20
10
0
No
Yes
LEUKOPLAKIA
ORALSUBMUCOUS FIBROSIS
NICOTINA PALATI
LEUKOEDEMA
APTHOUS ULCERS
GEOGRAPHIC TONGUE
hairy tongue
angular cheilitis

Table 7: Distribution of responses according to Lesion findings on intraoral and extraoral examination for Gender. p value by Chi square test

Lesion findings on intraoral and extraoral examination	Male		Female		P value
	No	Yes	No	Yes	
TONGUE THRUSTING	70(19.5%)	02(0.6%)	277(77.1%)	10(2.8%)	0.2090(NS)
THUMB SUCKING	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
MOUTH BREATHING	72(20.1%)	00(0%)	281(78.3%)	06(1.6%)	0.4651(NS)
NAIL BITING	72(20.1%)	00(0%)	284(79.1%)	03(0.8%)	0.6842(NS)
CANDIDIASIS	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
MELANOTIC MACULE	72(20.1%)	00(0%)	286(79.7%)	01(0.2%)	0.8818(NS)
LINEA ALBA	69(19.2%)	03(0.8%)	277(77.2%)	10(2.8%)	0.4662(NS)
TOBACCO KERATOSIS	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
TONGUE DEPAPILLATION	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
TRAUMATIC FIBROMA	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
FORDYCES GRANULES	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
PETECHIE/HAEMANGIOMA	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
FISSURED TONGUE	71(19.8%)	01(0.3%)	277(77.2%)	10(2.8%)	0.5726(NS)
DRY MOUTH	67(18.6%)	05(1.4%)	275(76.6%)	12(3.4%)	0.0698(NS)
ANKYLOGLOSSIA	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
STOMATITIS UNDER PROSTHESIS	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
LEUKODERMA	72(20.1%)	00(0%)	286(79.7%)	01(0.2%)	0.8818(NS)
CRANULATED TONGUE	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
MUCOCEOL	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
FISTULA	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
TORI	68(18.9%)	04(1.2%)	284(79.1%)	03(0.8%)	0.0342(S)
LINGUAL VARICOSITY	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
IMPRESSION OF TEETH ON ORAL MUCOSA	72(20.1%)	00(0%)	282(78.5%)	05(1.4%)	0.4633(NS)
LICHEN PLANUS	71(19.8%)	01(0.3%)	286(79.7%)	01(0.2%)	0.2806(NS)
LEUKOPLAKIA	70(19.5%)	02(0.6%)	280(78.0%)	07(1.9%)	0.5190(NS)
ORALSUBMUCOUS FIBROSIS	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
NICOTINA PALATI	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
LEUKOEDEMA	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
APTHOUS ULCERS	64(17.8%)	08(2.2%)	255(71.1%)	32(8.9%)	0.6870(NS)
GEOGRAPHIC TONGUE	68(18.9%)	04(1.2%)	281(78.3%)	06(1.6%)	0.2241(NS)
HAIRY TONGUE	72(20.1%)	00(0%)	287(79.9%)	00(0%)	2.2e-16(S)
ANGULAR CHEILITIS	60(16.7%)	12(3.4%)	256(71.3%)	31(8.6%)	0.3444(NS)

Table 8: kappa value for observations between two observers

	Between observer 1 and observer 2	Between observer 1 and observer 3	Between observer 2 and observer 3
Fordyce's Granules	0	-	0
Fissured Tongue	0.84	1	0.84
Dry Mouth	0.94	0.97	0.91
Ankyloglossia	0	0	-0.0037
Lichen Planus	0.66	0.44	0.35
Fibrosis	0	0	-0.0080
Leukoplakia	0.95	0.89	0.85
Lingual Varicosity	-	0	0
Impression Of Teeth On Oral Mucosa	1	0.85	0.85
Nicotina Palati	-	0	0
Leukoedema	-	0	0
Apthous Ulcers	0.99	0.93	0.92
Geographic Tongue	0.91	0.95	0.87
Hairy Tongue	-	0	0
Angular Cheilitis	0.96	0.97	0.4

Kappa value	Interpretation
<0	Poor
0.01 - 0.20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81 - 1.00	Almost perfect