Research Article

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# Prevalence of Oral Irritation fibroma and Associated Risk Factors in Sana'a City

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## ABSTRACT

***Background and Aims:*** *On the oral cavity's mucosa, irritation fibroma is one kind of fibroma. Common benign tumors called irritation fibromas are asymptomatic and mimic scarring. Prolonged oral irritation, including biting of the cheek or lip, tooth rubbing, and dental prostheses, is the cause of them. The study's objective was to find out how often irritation fibroma and its contributing factors were in a sample of Yemeni dentistry patients in Sana'a City.*

***Method:*** *A study examined 1,485 Yemeni patients at dental clinics, collecting demographic data, risk factors, dental history, and habits. Patients underwent clinical examinations and intraoral examinations, with oral lesions detected through intraoral examinations. If any tumors were found, patients were referred for histological examination. The data was analyzed and tabulated.*

***Results:*** *The study included 589 females and 898 males, with a mean age of 35.97±13.9. Most patients were aged ≤15, with married patients comprising 36% and single patients comprising 60%. Occupations were primarily employee, students, workers, and housewives. Irritation fibroma is most common in the age group 36-45 years, with 19.4% of cases. It is more prevalent in individuals aged 26-35 years, 4.2% in those over 56 years, 2.9% in 46-55 years, and 2.8% in young adults. Irritation fibroma is more prevalent in males, with a frequency of 5.02%, indicating a significant association with male sex. Age group 36-45 years also shows a higher prevalence of 6.4%, with an associated odds ratio of 1.9 times. Qat chewing and smoking were found to be risk factors for Irritation fibroma, with an OR of 2.6 times and 2.5 times respectively. Tooth grinding, cheek biting, and poor mouth hygiene are risk factors for the development of Irritation fibroma. Tooth grinding is 10 times more likely to cause the condition, while cheek biting is 14.2 times more likely. Poor mouth hygiene is 1.6 times more likely. The study found that depopulated tongue, gingivitis history, and periodontitis were significant risk factors for the development of Irritation fibroma lesions, with a significant OR of 4.7 times and 15.4 times respectively.*

***Conclusion:*** *In the current study, irritant fibroma lesions were very common among patients attending dental clinics in Sana'a city. Compared with males, the prevalence of lesions in male patients was higher than females, and older age groups were more likely to develop oral irritation fibromas lesions but even children there was detectable prevalence of irritation fibromas.*

## Keywords
Benign tumors, Irritation fibroma, Oral cavity's mucosa, Prevalence, Risk factors.

## Introduction
One kind of fibroma that develops on the oral mucosa is called an irritant fibroma [1]. Common benign tumors that resemble scars and are asymptomatic are called irritant fibromas. They are brought on by chronic oral discomfort, including dentures, teeth grinding, and biting of the cheek or lip. Fibromas are smooth, hard, and fibrous; they may be lighter in color than the oral mucosa, but they are typically the same. Their color may be darker if they are injured. They typically occur alone and do not progress to mouth cancer. Irritating fibromas usually exhibit thickening of the stratum corneum (hyperkeratosis) and hyperplasia (hyperplasia) in their epidermis [2]. They frequently have clear edges and develop extrinsically from the surface. They can have a solid or pedunculated base [3]. They rarely develop larger than one and a half centimeters in diameter, and their growth is sluggish and painless, taking months or years. They are a localized increase of connective tissue rather than actual tumors. In the dermis of irritating fibromas, histology reveals dilated blood vessels, a proliferation of mature fibroblasts, and thick collagen fibers. Infiltration of inflammatory cells is either negligible or nonexistent. Clinical characteristics are used to suppose irritant fibromas [4], however histological examination (such as biopsy [1]) may be carried out. Irritating fibromas can be treated by surgical excision. Although recurrence is rare, it can occur if the irritant persists [3]. As a result, treating the root problem is crucial [1]. If irritant fibromas are not treated, they do not go away on their own. Although they can develop at any age, irritant fibromas are more prevalent in the elderly [1]. especially people in their 50s and 60s [1]. In females, they are twice as prevalent. In adults, the condition affects one to two percent of people. Furthermore, because the gingiva is continuously exposed to irritants including food particles, tartar, dental plaque, broken fillings, and uncomfortable brushing, a large number of oral mucosal lesions are reactive. Persistent inflammation brought on by chronic irritation can promote the growth of endothelial cells and chronic inflammatory cells [6-8]. Even though our study found a considerable frequency among youngsters, fibroma is one of the most common benign soft tissue tumors of the oral cavity in adults. This tumor, which is classified as a reactive hypertrophic lesion, presents clinically as impaired tissue repair as a result of persistent oral mucosal irritation [9-12]. An imbalance of the forces that ordinarily hold teeth in place can also result from this lesion, a process known as pathological tooth migration [13,14]. Irritant fibromas can develop centrally (intraosseously) inside the jaws or on the soft tissues of the oral cavity, including the tongue, gingiva, etc. Lesions of irritant fibroma are more commonly observed on the tongue, buccal mucosa, gingiva, and alveolar ridge. The floor of the mouth and the hard palate are less frequently involved [15-17].

This study's objective was to determine the prevalence of oral irritant fibroma lesions and the factors that were linked to them in a sample of Yemeni dentistry patients in Sana'a.

## Methodology
**Study design:** An observational cross-sectional clinical study.

**Study population:** The dental clinics at Sana'a University, Alrazi University, Alyemenia University, Aljomhori, and Althawra Hospital comprise a sample of Yemeni patients.

**Inclusion criteria**: Adults and children over 5 years Yemeni dental patients.

**Exclusion criteria**: Children below 5 years, edentulous patients and non-Yemeni patients.

**Sample size calculation:** All patients visiting the oral medicine department of the three universities and few private dental clinics between February 2025 and June 2025 were included, according to the predetermined inclusion criteria.

**Method of data collection:** Examined were 1,485 Yemeni patients who visited the chosen dental clinics, 896 of whom were men and 589 of whom were women. All participants gave their informed consent, and each patient's relevant data was recorded using a data collecting routine. Risk factors and demographic information were gathered before the clinical assessment. Additionally, information about prior dental procedures, any subpar restorations, and their location were confirmed. Additionally noted were behaviors like smoking, snuff use, chewing qat, teeth grinding, cheek biting, and poor oral hygiene. In a dental chair, participants got an intraoral examination and an additional clinical evaluation. An intraoral examination of soft tissues was performed, and if any oral lesions were found, the patient was referred to hospitals for histological examination to determine the tumor type. After collecting the information and laboratory results, the data were analyzed and tabulated.

**Ethical considerations:** Formally, Sana'a University No. (263), the Medical Ethics Committee of the Faculty of Dentistry, granted ethical permission. Every participant in the study gave their consent after permission to evaluate the patients was requested.

## Results
The number of females was 589 (39.7%) and males 898 (60.3%), with 147 (9.9%) of patients aged ≤ 15 years, 287 (19.3%) aged 16-25 years, 277 (18.7%) aged 26-35 years, 298 (20.1%) 36-45 years, 240 (16.2%) aged 46-55 years and 236 (15.9%) of patients aged ≥56 years. The mean age ± SD was 35.97±13.9 (Table 1). Married patients comprised 535 (36%), while single patients comprised 891 (60%) and widows were 59 (4%). Regarding occupations, most patients were employee (455) (30.6%), students (453) (30.5%), followed by workers (304) (20.5%), housewives (178) (12%), while other occupations were less common (Table 2). Most Irritation fibroma occurred in the age group 36-45 years, with 19 cases (6.4%) of the total, followed by 26-35 years with prevalence rate equal to 5.4% (15 cases), while only 2 cases (1.4%%) were in the age group ≤15 years (children). Also, the rate of irritation fibroma was 4.2% in ≥56 years, and 2.9% in 46-55 years. In young

adults (16-25 years) the rate was 2.8%. Regarding gender, most Irritation fibroma occurred in males, with 45 cases (5.02%) of the total, while only 16 cases (2.72%) were in females (Table 2). The correlation between age, sex, and the prevalence of Irritation fibroma is displayed in Table 4. In male sex, the frequency of Irritation fibroma was higher than in females. For males, it was 5.02%, with an associated odds ratio (OR) of 1.8, a confidence interval (CI) of 1.1– 3.4, and $X^2$=4.7, with a p-value of 0.01. This indicates that the correlations and ORs were present with males, concluding that there is a significant association between Irritation fibroma and male sex. Regarding age, the prevalence of Irritation fibroma was higher in age group 36-45 years, reaching 6.4%, with an associated OR of 1.9 times, a CI of 1.1– 3.2, with a significant $X^2$ of 4.9, and a p-value of 0.02 (Table 3). Table 4 illustrates the correlation between the occurrence of oral and dental disorders and Irritation fibroma lesions as well as personal activities like smoking, qat usage, oral cleanliness, and Shammah. An associated odds ratio (OR) of 2.6 times, a confidence interval (CI) of 1.5-4.4, a significant X2 coefficient of 13.2, and a P value of 0.0002 were found when qat chewing was examined as a risk factor for Irritation fibroma. Also, smoking was an associated risk factor for developing Irritation fibroma, in which the OR was 2.5 times, with a confidence interval (CI) of 1.5-4.4, with a significant $X^2$ coefficient of 11.7 and a P value of 0.0006. Tooth grinding was a risk factor associated with the development of Irritation fibroma with an OR of 10 times, confidence interval (CI) of 4.3-26.9, with a significant $X^2$ coefficient of 38.8 and P value < 0.0001. Cheek biting was a risk factor associated with the development of Irritation fibroma with an OR of 14.2 times, confidence interval (CI) of 6.2 to 30.2, with a significant $X^2$ coefficient of 80, P value < 0.0001. Poor hygiene status of the mouth was a risk factor associated with the development of Irritation fibroma with an OR of 1.6 times, confidence interval (CI) of 1.01 -2.8, with a slightly significant $X^2$ coefficient of 3.9 and P value of 0.05. Depopulated tongue was a risk factor associated with the development of Irritation fibroma with an OR of 4.7 times, confidence interval (CI) of 1.02-22, with a significant $X^2$ coefficient of 4.8, P value 0.02. A history of gingivitis was a risk factor associated with the development of Irritation fibroma lesions with an OR of 15.4 times, confidence interval (CI) of 8.4-28, with a significant $X^2$ coefficient of 129, P value < 0.0001. An association of periodontitis with the development of Irritation fibroma lesions was found in which OR was 1.9 times, confidence interval (CI) of 0.7 to 45, with non-significant $X^2$ coefficient of 2.1, P value 0.14.

**Table 1:** Sex and age distribution of patients presenting to oral medicine departments for investigation of Irritation fibroma.

| Characters | N | % |
|---|---|---|
| **sex** | | |
| Female | 589 | 39.7 |
| Male | 896 | 60.3 |
| **Age groups** | | |
| ≤ 15 year | 147 | 9.9 |
| 16- 25 Year | 287 | 19.3 |
| 26-35 years | 277 | 18.7 |
| 36-45 years | 298 | 20.1 |
| 46-55 years | 240 | 16.2 |
| ≥56 years | 236 | 15.9 |
| Total | 1485 | 100 |
| Mean age | 35.97 | |
| SD | 13.9 | |
| Range | 7 – 71 years | |

**Table 2:** Distribution of social and occupational status of patients presenting to oral medicine departments for investigation of Irritation fibroma.

| Characters | N | % |
|---|---|---|
| **Marital status** | | |
| Married | 535 | 36 |
| Single | 891 | 60 |
| Widow | 59 | 4 |
| **Occupation** | | |
| Employee | 455 | 30.6 |
| Students | 453 | 30.5 |
| Workers | 304 | 20.5 |
| Housewife's | 178 | 12 |
| Teachers | 25 | 1.7 |
| Soldiers | 70 | 4.7 |
| Total | 1485 | 100 |

**Table 3:** Association between sex, age, and incidence of Irritation fibroma.

| Characters | Positive IF N (%) | OR | 95% CI | $X^2$ | P |
|---|---|---|---|---|---|
| **sex** | | | | | |
| Female n=589 | 16 (2.72) | 0.51 | 0.29-0.9 | 4.7 | 0.01 |
| Male n=896 | 45 (5.02) | 1.8 | 1.1-3.4 | 4.7 | 0.01 |
| **Age groups** | | | | | |
| ≤ 15 year n=147 | 2 (1.4) | 0.29 | 0.07-1.2 | 3.1 | 0.07 |
| 16- 25 year n=287 | 8 (2.8) | 0.6 | 0.2-1.3 | 1.5 | 0.2 |
| 26-35 years n=277 | 15 (5.4) | 1.4 | 0.79-2.6 | 1.4 | 0.2 |
| 36-45 years n=298 | 19 (6.4) | 1.9 | 1.1-3.2 | 4.9 | 0.02 |
| 46-55 years n=240 | 7 (2.9) | 0.66 | 0.3-1.4 | 1.03 | 0.3 |
| ≥56 years n=236 | 10 (4.2) | 1.01 | 0.51-2.04 | 0.004 | 0.98 |
| Total n=1485 | 61 (4.11) | | | | |

Irritation fibroma=IF.

## Discussion

In Yemen, routine dental clinics and hospitals routinely encounter oral neoplastic lesions, such as reactive benign prosthetic hyperplasia (BPH), in the oral mucosa [15,17,18-21]. When a patient comes to an outpatient dental clinic for routine care, these lesions may be symptomatic or discovered by chance. Numerous factors, including age, gender, the extent of irritation or damage, lesion type, and distribution, influence how these lesions manifest clinically [16]. The most prevalent risk factors include chronic low-grade inflammation, frequent chronic irritation from plaque and tartar buildup, biting of the cheek, hormonal imbalances, and exogenous trauma from things like loose fillings, sharp edges of broken teeth, and poorly fitting dentures [15,22]. Several research have been carried out to gather epidemiological data on oral cavity lesions or neoplastic lesions in general in Yemen [15,18-20,23-29]. Statistics on benign irritant fibromas, which are lesions of the oral mucosa that can lead to recurrent issues like poor masticatory

function or cosmetic dissatisfaction, have not, however, received much attention.

Males were more likely than females to have irritant fibroma in the current study. The correlations and ORs were present with males, indicating a significant association between male sex and irritation fibroma. For males, it was 5.02%, with an associated odds ratio (OR) of 1.8, a confidence interval (CI) of 1.1–3.4, and $X^2$ =4.7, with a p-value of 0.01. This current data contrasts with that published in Brazil, where Kamile LD et al. [30] discovered that the prevalence of these irritant fibroma oral lesions is 2.5:1 higher in females than in males.

Additionally, our sex distribution is different from that of Da Saliva et al. in Nigeria [31] and Soyele OO et al. [32] in Brazil, where the majority of irritant fibroma oral lesions were recorded in females as opposed to males, with ratios of 2:1, 1.8:1, and 1.4:1, respectively [31,32]. Lesions were also shown to be more common in women than in men (2.2 times higher) in research by Sangle et al. [33], Kadeh H et al. [34], and Ala Aghbali [35], which is in line with the findings of all the other studies cited [33-35]. It is possible that hormones play a predisposing role in the formation of these lesions, which explains why they are more common in female patients globally. Additionally, in Iran, Nigeria, and Pakistan, women visit dental clinics more frequently than males for examinations and treatment, which may be a reflection of their increased concern for oral hygiene outside of Yemen. Men in Yemen, however, can be just as concerned about their dental health as women are, if not more so.

According to the current study, the age group of 36–45 years old had a greater prevalence of irritant fibroma (6.4%), with an associated OR of 1.9 times, a CI of 1.1–3.2, a significant X2 of 4.9, and a p-value of 0.02. Similar findings were reported by Ayaz M et al. in Pakistan [36], Kadeh et al. in Iran [37], Kumar et al. [38] in India, Halikiri et al. [39], and Awange et al. in India [40], where the mean age was 30 years lower than our mean age of 35 years and there was a high incidence of oral irritation fibroma lesions in the second and third decades. Our findings, however, contrast with those of Soyele O et al. [25], who discovered that oral irritation fibroma lesions occur in a broad age range, from 10 to 70 years, with a higher prevalence in the fifth, sixth, and seventh decades of life.

In the current investigation, only two cases (1.4%%) of irritant fibroma occurred in the age range ≤15 years (children), whereas the majority (6.4%) occurred in adults (36–45 years). There is a dearth of data on the frequency of reactive hyperplasias in children, particularly with reference to irritant fibroma. Few studies have been published to date, and the results vary greatly, likely because the criteria used—such as age range and type of injury—as well as because the nations included in the studies varied geographically and endemically [41-44]. - Nonetheless, it has been established that reactive lesions are uncommon in children under the age of fifteen, especially in primary dentition, and that children are more likely to present giant cell fibromas than irritation fibromas, which in turn are more common in adult patients [9,45].

An associated odds ratio (OR) of 2.6 times, a confidence interval (CI) of 1.5-4.4, a significant X2 coefficient of 13.2, and a P value of 0.0002 were found when khat chewing was investigated as a risk factor for oral irritation fibroma lesions in the current study. Additionally, smoking was linked to an increased risk of irritant fibroma, with an OR of 2.5 times, a CI of 1.5-4.4, a significant X2 coefficient of 11.7, and a P value of 0.0006. It has been established that smoking and chewing qat are significant stimulants of the development of oral irritation fibromas lesions. Compared to other reactive lesions, patients with RHLs have a greater smoking incidence, according to DaSilva et al. [31]. A thorough histological assessment and verification of the lack of an infected lesion base are crucial for preventing recurrence. Additionally, patients and dentists should work to limit manageable stressors like smoking

**Table 4:** The relationship between Irritation fibroma and personal behaviors such as oral hygiene, qat consumption, Shammah, and smoking; and the incidence of oral and dental diseases.

| Factors | | Irritation fibroma **N (%) n=61** | **OR** | **CI** | **$X^2$** | **P value** |
|---|---|---|---|---|---|---|
| Qat chewing n=693 | yes | 38 (5.2) | 2.6 | 1.5-4.4 | 13.2 | 0.0002 |
| Shammah intake n=37 | | 0.0 (0.0) | 0 | undefined | 1.6 | 0.2 |
| Smoking n=249 | yes | 20 (8.03) | 2.5 | 1.5-4.4 | 11.7 | 0.0006 |
| Teeth grinding n=24 | yes | 7 (25.9) | 10 | 4.3-26.9 | 38.8 | 0.000 |
| Check biting n=36 | yes | 12 (33.3) | 14.2 | 6.2-30.2 | 80 | 0.00 |
| Hygiene status | fair n=484 | 22 (4.5) | 1.1 | 0.6-2 | 0.3 | 0.56 |
| | good n=560 | 14 (2.5) | 0.47 | 0.26-0.8 | 5.9 | 0.015 |
| | poor n=441 | 25 (5.7) | 1.6 | 1.01-2.8 | 3.9 | 0.05 |
| Intra oral examination | Depopulated tongue n=12 | 2 (16.7) | 4.7 | 1.02-22 | 4.8 | 0.02 |
| | NAD n=1473 | 19 (1.3) | | | | |
| Periodontal diseases | Gingivities n=68 | 21 (30.9) | 15.4 | 8.4-28 | 129 | 0.000 |
| | Periodontitis n=83 | 6 ( 7.2) | 1.9 | 0.7-45 | 2.1 | 0.14 |
| Examination of teeth | Caries n= 1464 | 60 (4.1) | 0.8 | 0.1-6.4 | 0.02 | 0.87 |
| | NAD n=21 | 1(4.8) | - | - | - | - |

and chewing khat. With an OR of 10 times, a significant X2 coefficient of 38.8, a CI of 4.3-26.9, and a P value < 0.0001, tooth grinding was found to be a risk factor for the development of irritation fibroma in the current study. With an OR of 14.2 times, a significant X2 coefficient of 80, a P value < 0.0001, and a confidence interval (CI) of 6.2 to 30.2, cheek biting was a risk factor linked to the development of irritation fibroma. With an OR of 1.6 times, a CI of 1.01-2.8, a modestly significant X2 coefficient of 3.9, and a P value of 0.05, poor oral hygiene was a risk factor linked to the development of irritation fibroma. Numerous studies have revealed that all of the above mentioned characteristics were risk factors [17,31,38-40].

Although they lack any malignant characteristics on histology, benign oral lesions are mainly hypertrophic tumor-like proliferations [46]. These lesions are tiny, reactive growths that may appear as a result of trauma or ongoing irritation to the soft tissues of the mouth [47]. Teeth grinding, cheek biting, poor oral hygiene, mouth picking, the development of pigmented and white oral lesions, and periodontitis are the most frequent causes of chronic irritation of the oral mucosa. According to earlier research, these factors are the most important risk factors for these oral lesions [46,47]. This could be explained by the fact that local traumatic injuries such cheek biting and foreign substances cause mucosal irritation, and poor dental hygiene results in heavy plaque and tartar deposition [48,49].

Depopulated tongue was a risk factor for oral irritation fibroma lesions in the current investigation, with an OR of 4.7 times, a significant X2 coefficient of 4.8, and a P value of 0.02. The CI was 1.02–22. With an OR of 15.4 times, a significant X2 coefficient of 129, a P value < 0.0001, and a confidence interval (CI) of 8.4-28, a history of gingivitis was a risk factor linked to the development of irritation fibroma lesions. There was a non-significant X2 coefficient of 2.1, a P value of 0.14, and an OR of 1.9 times, with a confidence interval (CI) of 0.7 to 45, linking periodontitis to the development of irritation fibroma lesions. All previous risk factors associated with oral irritation fibroma lesions were mentioned by studies from Pakistan [36], Iran [37], and India [38].

## Limitation

Because exposure and outcome are only measured once, cross-sectional technique makes it challenging to draw causal relationships. This kind of study is prone to bias because of the brief time frame for data collection and the fact that it only looks at one area of Yemen.

## Conclusions

Urgent action is now needed to stop the incidence and progression of oral irritation fibroma lesions, which are becoming more common in Yemen and around the world. This can be accomplished simply by offering patients who visit the dental clinic for regular examinations or any kind of dental treatment education seminars on good oral hygiene. The significance of keeping good oral hygiene and excellent appearance for a better and healthier life is typically unknown to those without access to dental care. Additionally, older age groups were more vulnerable with a higher incidence rate of oral irritant fibroma lesions, and female patients had a lower frequency of the lesions than male patients.


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