



Ministry of High Education  
and scientific research  
University of Baghdad  
College of Dentistry



# **The Prevalence of Oral Pigmented Lesions among Sample of Dental Students .**

A projects submitted to  
College of dentistry ,University of Baghdad, Department of oral medicine in  
partial fulfillment  
For the bachelor of dental surgery .

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# **Dedication**

For all those who have to fight for the respect  
that everyone else is given without question.

## **Acknowledgment**

The completion of this project could not have been possible without the participation and assistance of so many people whose names may not all be enumerated. Their contributions are sincerely appreciated and gratefully acknowledged.

I would like to express my deep appreciation and indebtedness particularly to my supervisor **Assist.prof.Dr. Aameena Ryhan** for her endless support, kind, efforts, time , advice and scientific opinions and I'm really proud to be one of her students.

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Above all, to the Great Almighty, the author of knowledge and wisdom, for his countless love. I thank you.

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# ABSTRACT

## **Background:**

Pigmented oral lesions are commonly found in the mouth. Such lesions represent a variety of clinical entities, ranging from physiologic changes to manifestations of systemic illnesses and malignant neoplasms. Evaluation of a patient presenting with a pigmented lesion should include a full medical and dental history, extra oral and intra oral examinations and, in some cases, biopsy and laboratory investigations.

## **Aim of the study:**

To study the prevalence of pigmented oral lesions among sample of dental students in the university of Baghdad \collage of dentistry .

**Material and method:** Standardized case sheets for all participants were filled, which include: demography (Name, age, gander) patient's medical history, previous COVID-19 infection, medications, risk factors, and the location of the pigmented lesion. Oral examinations were done according to the standard methods of the oral health surveys of the WHO(1987) by starting from the labial and buccal mucosa followed by the tongue, palate, floor of the mouth.

## **Results :**

Out of 100 examined students, generally, oral pigmentations were seen in (31%) of them. The age group of the examined student was (19-24) years, with an average age of (21) years. Female participants were (54%) and males were (46%). Females were mostly affected with psychological pigmentations, while males were mostly affected with smoker melanosis. The most common type of oral pigmented lesions were the physiological pigmentation (17%) followed by smoker melanosis being (12%) and only (2%) were drug induced pigmentations.

Out of the 100 examined students (86%) of them were previously infected by Covid-19; however, none of them were seen with oral pigmentations.

## **Conclusion :**

- 1-Generally (31%) of the students were seen with oral pigmentations.
- 2-Females were mostly affected with psychological pigmentations.
- 3- Males were mostly affected with smoker melanosis.
- 4-No oral pigmentations were seen associated with previous Covid-19 infection.



## INTRODUCTION

The mucous membranes lining the oral cavity are not uniformly colored and dependent upon the specific anatomic location; healthy tissue commonly ranges in color from white to red-purple.

This is due to the interaction of various tissues that compose the mucosal lining, including presence or absence of keratin on the surface epithelium, location and presence of vascular structures in the stoma, existence of adipocytes, and the lack of melanin pigmentation in the basal cell layer of the epithelium (**Kauzman et al,2018**). Pigment deposition, whether physiologic or pathologic, or attributed to endogenous or exogenous substances, will impart gray, blue, brown and/or black color changes to the oral mucosa. The most common endogenous sources of pigmentation are melanin, hemoglobin, and hemosiderin, while exogenous sources of pigmentation are usually attributed to traumatic or iatrogenic events that result in deposition of foreign material directly into the mucosal tissues. Several parameters associated with pigmented lesions, such as location, shape, color, and size, must be assessed in order for clinicians to appropriately evaluate and manage the condition, as pathology of pigmented lesions ranges from benign to malignant. Clinicians should conduct a thorough medical, family, and social history, as well as a relevant physical examination for patients with pigmented lesions, to identify possible adrenal, gastrointestinal, or genetic disorders that are commonly associated with these types of lesions (**Divan et al,2018**).

If a systemic disorder is suspected, the patient should be promptly referred to the appropriate health-care provider for further evaluation and management. Multidisciplinary care is often necessary to effectively manage patients with these conditions (**Madly et al,2018**).

# Chapter one

literature review

## 1.1 Classification of the pigmented lesions

Oral pigmentation may be exogenous or endogenous in origin.

Exogenous pigmentation is commonly due to foreign-body implantation in the oral mucosa (**Sagon et al.2006**).

Endogenous pigments produced within the body.this may be as a result of normal body metabolism, which include melanin, hemoglobin, hemosiderin and carotene (**Sagon et al.2006**).

### 1.1.1- Endogenous pigments

Endogenous pigments are characterized as hematogenous and nonhematogenous. Hematogenous pigments originate from blood and nonhematogenous pigments originate from non-blood, fat or fatlike, and non-fatlike substances ( **Perlmutter S 2009**).

Examples of endogenous hematogenous pigments found in the liver are hemosiderin and bilirubin. Examples of endogenous nonhematogenous pigments found in the liver are lipofuscin (fatlike) and copper (non-fatlike). Fetal liver tissue will always demonstrate endogenous nonhematogenous copper pigment ( **Perlmutter S 2009**).

### 1.1.2- Focal pigmentation

Hemangioma and vascular malformation .Hemangioma is a benign proliferation of the endothelial cells that line vascular channels . Vascular malformation is a structural anomaly of blood vessels without endothelial proliferation. Both lesions are developmental abnormalities, characterized by onset during infancy. Hemangiomas regress as the patient ages, but vascular malformation persists throughout life. The multi nodularity is racemose and diffuse. Tongue angiomas frequently extend deeply between the intrinsic muscles of the tongue. The lip mucosa is another common site for

hemangiomas in children; they appear mostly as localized, raised blue tumors (**Raut RB 2000**).

### **1.1.2.1 Freckles**

As seen in Figure (1), are common small, brown macules (5 mm). They appear on sun-exposed areas of the perioral skin and lips. These lesions darken after sun light exposure. It is a self-limiting condition depending on the amount of exposure to the sun. There have been no reports on malignant transformation. (**Kalugas et al .2002** ).



**Figure(1): Freckles on the lips (Kalugas et al .2002 ).**

### **1.1.2.2 -Oral melanotic macule**

Oral melanotic macules are relatively rare oral mucosal lesions, analogous to skin freckles, due to the focal increase of melanin production. These melanotic macules have been variously termed ephelis, melonosis, lentigo, solitary labial lentigo, labial melanotic macule, and oral melanotic macule . The vermilion border of the lower lip is most commonly involved, Figure (2). The buccal mucosa, palate, and gingiva are less commonly affected. The color is usually described as grey, brown, blue, black, or a combination of these (**Buchner et al 2003**).



**Figure(2): A darkly pigmented macule is present on the gingival mucosa (Carl Allen et al. 2002).**

### **1.1.2.3- Oral Melanoacanthoma**

Oral melanoacanthoma (MA) is a rare, benign pigmented lesion, similar to cutaneous MA, characterized by hyperplasia of spinous keratinocytes and dendritic melanocytes. The pathogenesis of oral MA remains uncertain, although its clinical behavior is suggestive of a reactive origin. The most common intraoral sites are the buccal mucosa, lip, palate and gingiva. The average age of presentation is 28 years, mainly in blacks, with a strong female predilection (**Bucal et al.2007**).



**Figure( 3): Oral melanoacanthoma. Intraoral view of palatal pigmented lesion. Arrows indicate the borders of the lesion ( Bucal et al.2007).**

#### **1.1.2.4- Oral melanotic nevi**

are uncommon oral lesions causing focal pigmentation. Melanotic nevi are benign melanocytic tumours originating from defective melanoblasts of the neural crest. Clinically, it is an asymptomatic, flat or slightly elevated lesion of brown or brown-black color. It is usually located on the palate and buccal mucosa and rarely on the gingiva and lips. Based on histological criteria, intraorally four types of nevi have been described: the intramucosal, junctional, compound and blue (Sreeja et al. 2015).

#### **1.1.2.5-Malignant melanomas**

Melanomas are malignant tumors derived from melanocytes. The most common site of involvement is the skin, although occasionally primary melanoma develops in other organs (eye, oral and nasal mucosa, vulval and anorectal mucosa, other gastrointestinal mucosa and the central nervous system (CNS)).Melanomas are a major cause of premature death from cancerThe most common sites for melanoma are the legs of women and the backs of men, despite these not being the sites of greatest sun exposure. Early detection is associated with improved survival (Perlmutter et al. 2013).



**Figure(4): A pigmented exophytic growth over the maxillary anterior gingiva (Perlmutter et al. 2013).**

## 1.1.3-Multifocal/diffuse pigmentation

### 1.1.3.1- Physiological pigmentation

Physiological pigmentation is common and results from an increase in the production of melanin pigment by the melanocytes. Darker skinned individuals are more commonly affected. The color of physiological pigmentation can range from light brown to almost black. Physiological pigmentation increases with age, and color intensity can be influenced by smoking, hormones and systemic medications (**Ishikawa et al. 2004**).

The attached gingiva is the most common location, but physiological pigmentation can be noted anywhere in the oral cavity, including the tips of the fungiform papillae on the dorsal tongue and the diagnosis of physiological pigmentation normally is made clinically and do not need any treatment. However, when it is performed, demonstrate increased melanin pigmentation of the basal layer, as well as occasional incontinent melanin and/or melanophages in the superficial lamina propria without increasing number of melanocytes (**Eisen et al.2000**).



**Figure(5): brown physiological lesion all around the attached gingiva (Eisen et al.2000).**

### 1.1.3.2 - Drug induced pigmentations

A number of medications may cause oral mucosal pigmentation. The pathogenesis of drug-induced pigmentation depends upon the causative drug. It can involve accumulation of melanin, deposits of the drug or one of its metabolites, production of pigments under the influence of the drug or deposition of iron after damage to the dermal vessels (**Dereure O et al. 2001**).

Mucosal discolouration associated with antimalarial like chloroquine is described as blue-grey or blue-black, and in most cases only the hard palate is involved. Laboratory studies have shown that these drugs may produce a direct stimulatory effect on the melanocytes. Minocycline is a synthetic tetracycline used in the long term treatment of refractory acne vulgaris. It can cause pigmentation of the alveolar bone, which can be seen through the thin overlying oral mucosa (especially the maxillary anterior alveolar mucosa) as a grey discolouration. Minocycline has also been reported to cause pigmentation of the tongue (**De Melo Filho et al.2012**).



**Figure (6) : Extensive hard palate hyperpigmentation associated with chloroquineuse(De Melo Filho et al.2012).**



### 1.1.3.3 - Smoker melanosis

Smoking may cause oral pigmentation in light-skinned individuals and accentuate the pigmentation of dark skinned patients. . In addition to periodontal destruction, a probable adverse effect of smoking on oral cavity is the pigmentation of oral mucosa. Apart from smoking, oral pigmentation has been associated with a variety of endogenous and exogenous etiologic factors. Meanwhile, a benign focal pigmentation of the oral mucosa, smoker's melanosis, has been attributed to smoking behavior (**Lerner et al.2007**). Melanin production in gingival tissue is stimulated as a result of the high content of nicotine and benzpyrene in tobacco smoke. On the other hand, disappearance of gingival pigmentation was observed following the reduction in smoking. Clinically, the lesion usually presents as multiple brown pigmented macules less than 1 cm in diameter, localized mainly at the attached anterior labial gingiva and the interdental papillae of the mandible (**Kondo et al.2011**).



**Figure ( 7): Smoker's Melanosis (Kondo et al.2011).**

## **- Etiology**

Smoker's melanosis may be due to the effects of nicotine (a polycyclic compound) on melanocytes located along the basal cells of the lining epithelium of the oral mucosa. Nicotine appears to stimulate melanocytes directly to produce more melanosomes, resulting in increased deposition of melanin pigment as basilar melanosis with varying amounts of melanin incontinence. Studies confirmed that smoker's melanosis is found in 25 to 31% of the smoking **(Hedin et al.2008)**.

## **- Pathophysiology**

Smoker's melanosis may be due to the effects of tobacco smoke on melanocytes located in the lining epithelium of the oral mucosa. It has been shown that melanin may bind many substances, including a variety of drugs, and has a high affinity for nicotine **(Hanioka T, et al.2005)**.

## **- Treatment and prognosis**

Lesions usually disappear between 3 months to 3 years for those who stop smoking. Smoker's melanosis is a benign, normal physiological reaction, and does not develop into cancer **(Hanioka T, et al.2005)**. If it does not disappear, however, a biopsy can verify the diagnosis. If Smoker's melanosis is destroyed by excessive smoking, as in the hard palate reverse smokers, who smoke with the glowing part of the cigarette inside the mouth for different reasons, a pale depigmented surface is first seen, indicating the loss of the protecting melanin **(Hanioka T, et al.2005)**.

Then a red inflammation sometimes occurs and cancer development may follow. In reverse smokers it is important to regularly inspect the areas with Smoker's melanosis to detect any melanin destruction, in order to stop smoking in time and thus prevent a cancer to develop (**Hanioka T, et al.2005**).

#### **1.1.3.4- Post inflammatory Pigmentation**

Long-standing inflammatory mucosal diseases, particularly lichen planus, can cause mucosal pigmentation.<sup>1</sup> This is seen more frequently in dark-skinned individuals. Clinically, multiple brown–black pigmented areas are noted adjacent to reticular or erosive lesions of lichen planus. The pathogenesis of postinflammatory pigmentation remains unclear. Histologically, there is increased production of melanin by the melanocytes and accumulation of melanin- laden macrophages in the superficial connective tissue (**Anjum et al.2003**).

#### **1.1.3.5- Melasma**

Melasma is a common acquired disorder of hyperpigmentation that is characterized by irregular light to dark brown patches on the forehead, cheeks, upper lip, and chin areas of the face. Prevalence rates vary from 1% to 50% in high-risk populations include individuals with darker skin types, pregnant women, and those residing in global locations with intense ultraviolet (UV) exposure (**Kivan et al.2003**).

Patterns of distribution of melasma include a centrofacial, malar, and mandibular pattern with the centro-facial distribution as the most common. In some instances, the neck, extensor arms, and upper back are also affected. These nonfacial areas are most commonly observed in menopausal women. Recent studies have documented an increase in erythema and telangiectasias in the affected areas, which suggests a vascular component for this condition (**Kim et al., 2007**).



**Figure( 8): Lichen planus–associated pigment (Dr. Carl Allen et al.2007).**

## **1.1.4 -Melanosis associated with systemic or genetic diseases**

### **1.1.4.1Hypoadrenocorticism**

Addison’s disease, or primary hypoadrenalism, is due to progressive bilateral destruction of the adrenal cortex by autoimmune disease, infection or malignancy. The lack of adrenocortical hormones in the blood stimulates production of adrenocorticotrophic hormone (ACTH) by the anterior pituitary gland. The increased production of ACTH induces melanocyte-stimulating hormone, which results in diffuse pigmentation of the skin and oral mucosa **(Kim et al.2008)**. Oral pigmentation may be the first sign of the disease. A biopsy of the oral lesions shows acanthosis with silver-positive granules in the cells of the stratum germinativum. Melanin is seen in the basal layer **(Chuong et al.1999)**.



**Figure( 9): Addison's disease pigmentation (Chuong et al.1999).**

#### **1.1.4.2cushing's syndrome/Cushing disease**

Cushing disease is caused by a primary activating pituitary pathology (usually neoplastic) that leads to continuous secretion of ACTH and  $\alpha$ -MSH into the blood stream. However, since the pathology resides in the pituitary, there is no negative feedback loop. While diffuse mucocutaneous pigmentation may be one of the first signs of the disorder, affected individuals will also manifest an array of complications associated with pathologically elevated serum corticosteroid levels (**Sangion et al.2001**). It is important to note that Cushing disease is not equivalent to Cushing syndrome (hyperadrenocorticism). While Cushing disease may be a cause of Cushing syndrome, not all forms of Cushing syndrome are caused by a primary pituitary disease. Cushing syndrome results from prolonged exposure to high concentrations of endogenous or exogenous corticosteroids (**Sangion et al.2001**).

### 1.1.4.3 Peutz-Jeghers syndrome

Peutz-Jeghers syndrome is a rare genetic disease associated with germline mutations in the STK11/LKB1 tumor suppressor gene. This autosomal dominant disorder is characterized by intestinal polyposis and increased susceptibility to an array of different cancer types. A highly distinctive pattern of labial, perioral and acral macular pigmentation represents one of the earliest clinical manifestations of this disease. The macular pigmentation usually mimics dark freckling but without the reliance of sun exposure to increase or diminish color intensity. Pigmentation may also occur inside the mouth, but this is not common.<sup>30</sup> The lip and perioral pigmentation are highly distinctive, although not pathognomonic for this disease ( **Sanjana MK et al.**).



**Figure ( 10 ): Typical pattern of pigmentation representative of PeutzJeghers syndrome.**

#### **1.1.4.4 Hyperthyroidism (Graves disease).**

Melanosis is a common consequence of hyperthyroidism (Graves' disease), particularly in dark-skinned individuals. Studies suggest that at least 40% of black patients with thyrotoxicosis may present with mucocutaneous hyperpigmentation. (Anma et.al 2011) melanosis is very rarely observed in Caucasian patients with the disease. The pigmentation tends to solve following treatment of the thyroid abnormality. The mechanism by which excessive thyroid activity stimulates melanin synthesis remains unclear (Chris et al. 2009 ).

#### **1.1.4.5 Primary Biliary Cirrhosis**

Diffuse mucocutaneous hyperpigmentation may be one of the earliest manifestations of primary biliary cirrhosis. Up to 47% of patients with this condition develop diffuse melanosis (Peter et. al.2004).

#### **1.1.4.6 Vitamin B12 (Cobalamin) Deficiency**

Vitamin B12 deficiency may be associated with a variety of systemic manifestations, including megaloblastic anemia, neurologic signs and symptoms, and various cutaneous and oral manifestations, which may include a generalized burning sensation, erythema, and atrophy of the mucosal tissue (Chuong et al.2009).

#### **1.1.4.7 HIV/AIDS and Associated Melanosis**

Diffuse or multifocal mucocutaneous pigmentation has been frequently described in HIV-seropositive patients. The pigmentation may be related to intake of various medications, including antifungal and antiretroviral drugs, or as a result of adrenocortical destruction by virulent infectious organisms (Chig et al.2005).

## **1.1.5 Idiopathic pigmentation .**

### **1.1.5.1 Laugier–Hunziker Pigmentation**

Laugier-Hunziker pigmentation (LHP) is an acquired disorder of hypermelanosis characterized by mucocutaneous hyperpigmentation (**Shangai sony et al.2003**).

## **1.1.6 Depigmentation**

### **1.1.6.1 Vitiligo**

## **1.1.7 Hemoglobin and Iron associated Pigmentation**

### **1.1.7.1 Ecchymosis**

### **1.1.7.2 Petechiae**

### **1.1.7.3 Hemochromatosis**

## **1.2.1 Exogenous pigmentation**

### **1.2.1.1 Amalgam Tattoos**

Amalgam tattoo is one of the most common causes of intraoral pigmentation, the etiology being embedded metallic silver. It presents clinically as a localized flat, blue–grey lesion of variable dimensions ( **Manstein et al. 2010**).



Amalgam may be introduced in several ways during restorative and surgical procedures:

1. It may be condensed in abraded gingiva during routine amalgam restorative work.
2. It may enter mucosa lacerated by rotary instruments during removal of old amalgam fillings or crown and bridge preparation of teeth with large amalgam restorations.
3. Broken pieces may be introduced into a socket or beneath the periosteum during extraction of teeth.
4. Particles may enter a surgical wound during root canal treatment with a retrograde amalgam filling.

The gingiva and alveolar mucosa are the most common sites of involvement, but these lesions may also involve the floor of the mouth and the buccal mucosa and the mandibular region being affected more than the maxillary region, treatment biopsy or observation only (**Risueño-Mata et al.2012**).



**Figure( 11): Amalgam Tattoo pigmentation (Risueño-Mata et al.2012).**

### **1.2.1.2 Graphite tattoo**

Graphite may be noticed in the oral mucosa through accidental injury with a graphite pencil. The graphite tattoo occurs predominantly in women and youngsters from age 5 to 21 years. The size is variable, generally from 1 to 15 mm, and macules are blue-gray in color. Graphite tattoos occurs most frequently on the anterior palate of young children, appearing as an irregular grey to black macule. A history of injury confirms the diagnosis; otherwise, a biopsy should be performed to exclude the possibility of other conditions **(Kathariya et al. 2001).**



**Figure (12): Graphite tattoo pigmentation (Kathariya et al. 2001)**

### **1.2.1.3 Ornamental Tattoos**

Mucosal tattoos in the form of lettering or complicated artwork are becoming increasingly common phenomena. Amateur tattoo inks are permanent and consist of simple, carbon particles—originating from a variety of sources, including burnt wood, plastic, or paper, and from a variety of inks, such as India ink, pen ink, and plant-derived matter (Meleti 2008).

### **1.2.1.4 Medicinal Metal and Induced Pigmentation**

Historically, a variety of metallic compounds have been used medicinally for the treatment of various systemic diseases. Fortunately, with the advent of methotrexate for the treatment of—rheumatoid arthritis, gold therapy is in less demand (Peeran et al. 2014).

### **1.2.1.5 Heavy Metal Pigmentation**

Diffuse oral pigmentation may be associated with ingestion of heavy metals. Nowadays, this phenomenon is unusually encountered. Yet it remains an occupational and health hazard for some individuals who work in certain industrial plants and for those who live in the environment in and around these types of facilities. Other relatively common environmental sources include paints, old plumbing, and seafood **(Peeran et al. 2014)**.

### **1.2.1.6 Hairy Tongue**

Hairy tongue is a relatively common condition of unknown etiology. The change in oral flora associated with chronic antibiotic therapy may be causative in some patients. The discoloration involves the dorsal tongue, particularly the middle and posterior one-third. Rarely children are affected. **(Kathariya et al. 2001)**.

## Chapter two

### Materials and method

# Materials and method

## 2.1 Human Sample

This project was performed on a sample consists of **100** selected dental students of the university of Baghdad college of dentistry .

## 2.2 Methods

Standardized case sheets for all the participants were filled, which included the demography( Name ,age, gander, address ). The medical history of the student which included ( Cardio vascular diseases ,Hematologic diseases,Respiratory diseases, Gastrointestinal diseases,Neurological diseases, Urinary diseases) (**appendex1**). Oral examinations according to the standard methods of the oral health surveys of the World Health Organization **WHO(1987)** by starting from the the labial and buccal mucosa followed by the tongue, palate, floor of the mouth.The data collected was entered in Microsoft Excel sheet and analyzed for simple statistics as mean and percentage .

## 2.3 Instruments

1. Gloves
2. Mask
- 3.Mirror
- 4.Alcohol

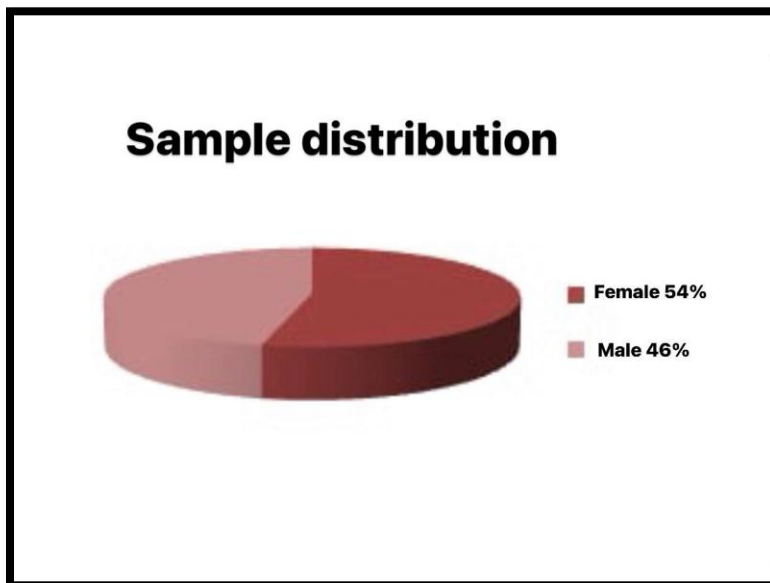
# Chapter three

## The Results

## The Results

### 3.1- Demography

This study was performed as a graduation project to determine the prevalence of oral pigmented lesions among a sample of undergraduate dental students. A total of **(100)** dental students were examined for oral pigmented lesions. The sample consisted of **(54%)** females and **(46%)** males as shown in figure (13). The age group was from **(19-24)** years, with an average age of **(21)** years.



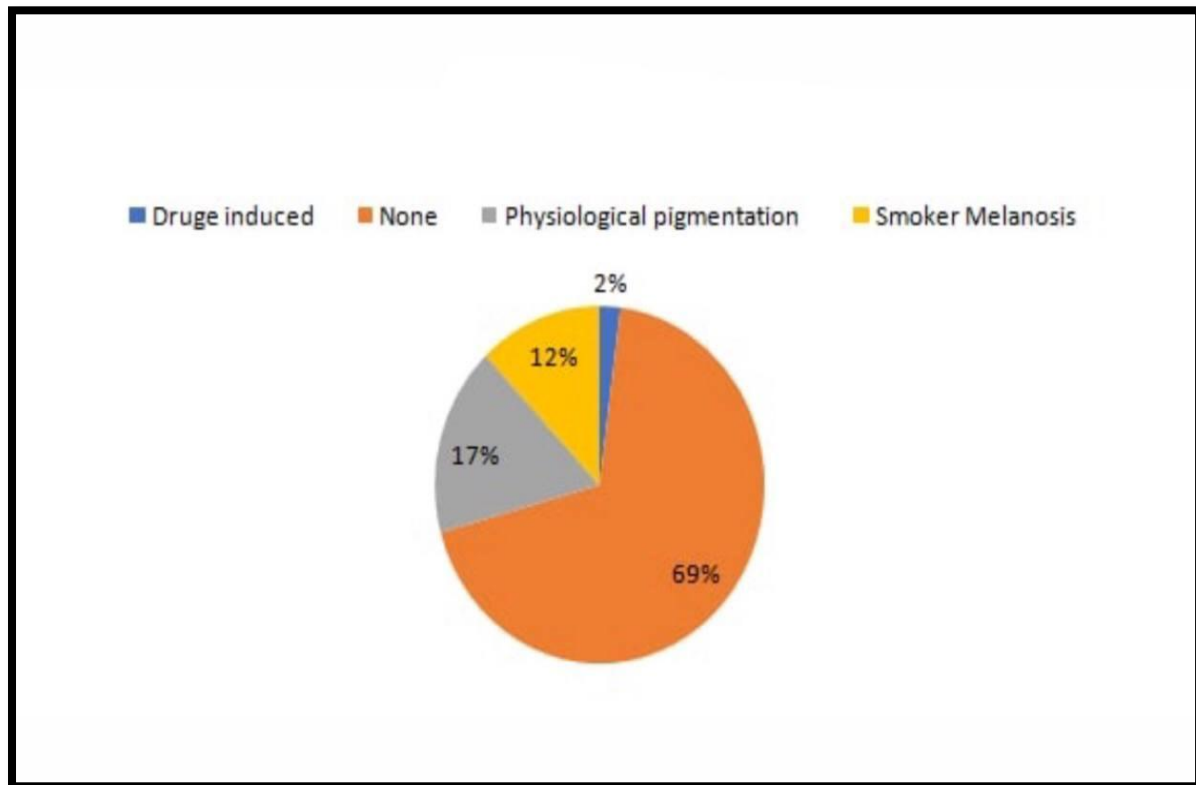
Figure( 13) Gender distribution of the sample .

### 3.2 The prevalence of pigmented lesions among dental students .

Out of 100 examined students, generally, oral pigmentations were seen in **(31%)** of them. The age group of the examined student was **(19-24)** years, with an average age of **(21)** years. Females were **(54%)** and males were **(46%)**. Females were mostly affected with psychological pigmentations **(9%)**, while males were mostly affected with smoker melanosis **(12%)**.



The most common type of oral pigmented lesions were the physiological pigmentation (17%) followed by smoker melanosis being (12%) and only (2%) were drug induced pigmentations showed up after they started using certain medications , namely, minocycline and tranquilizers ; **Figure (14)**.



**Figure (14)**The prevalence of pigmented lesions among dental students



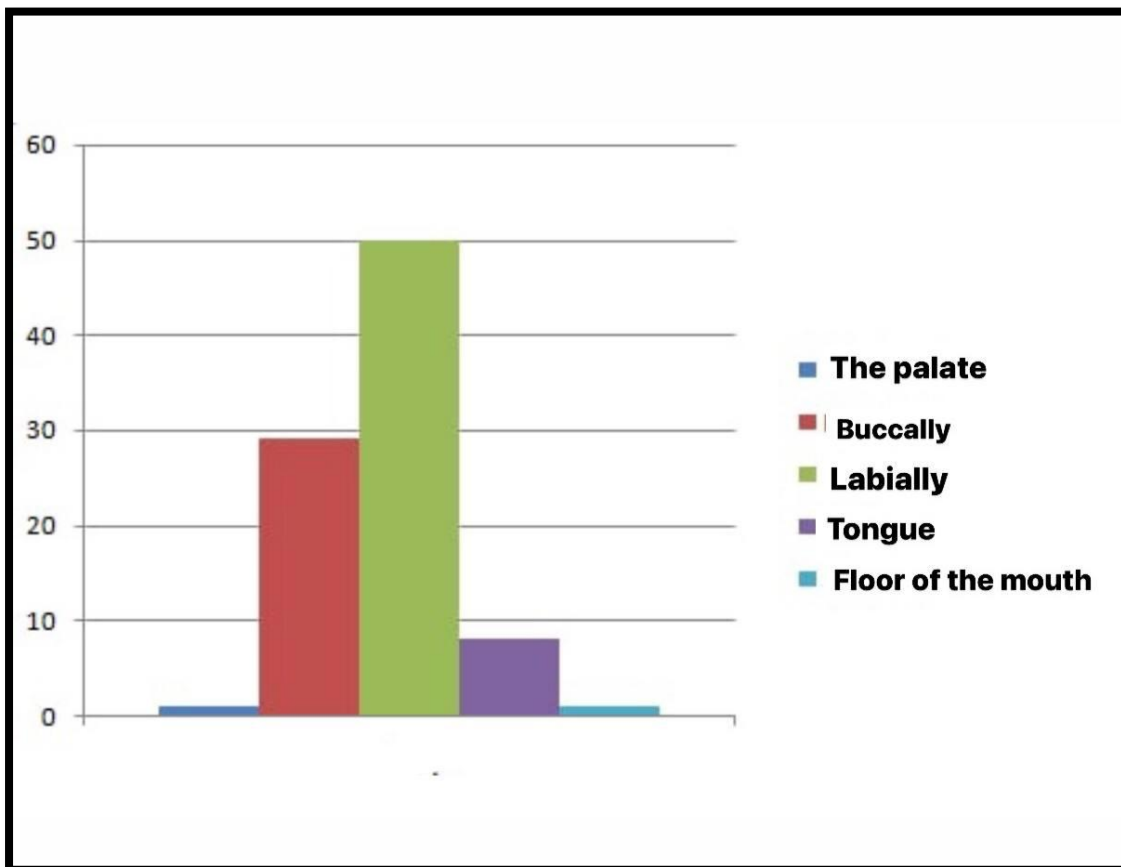
**Figure (15) Physiological pigmentation found all along the labial and Buccal attached gingiva in one of the dental students of university of Baghdad**

### **3.3-Medecations and medical history**

Out of the 100 examined students, 2% were seen with systemic diseases (asthma, diabetes, psychiatric disorders). Drug-induced oral pigmentations were found among them after using certain drugs like minocycline and tranquilizers. Regarding COVID-19, no students were seen with drug-induced oral pigmentations due to COVID-19 medications.

### **3.4 the most common location of the oral pigmentations.**

The most common location of the pigmentations included labially (67%), buccally (28%), floor of the mouth (3%), on the tongue (1%), on the palate (1%). Figure (15)

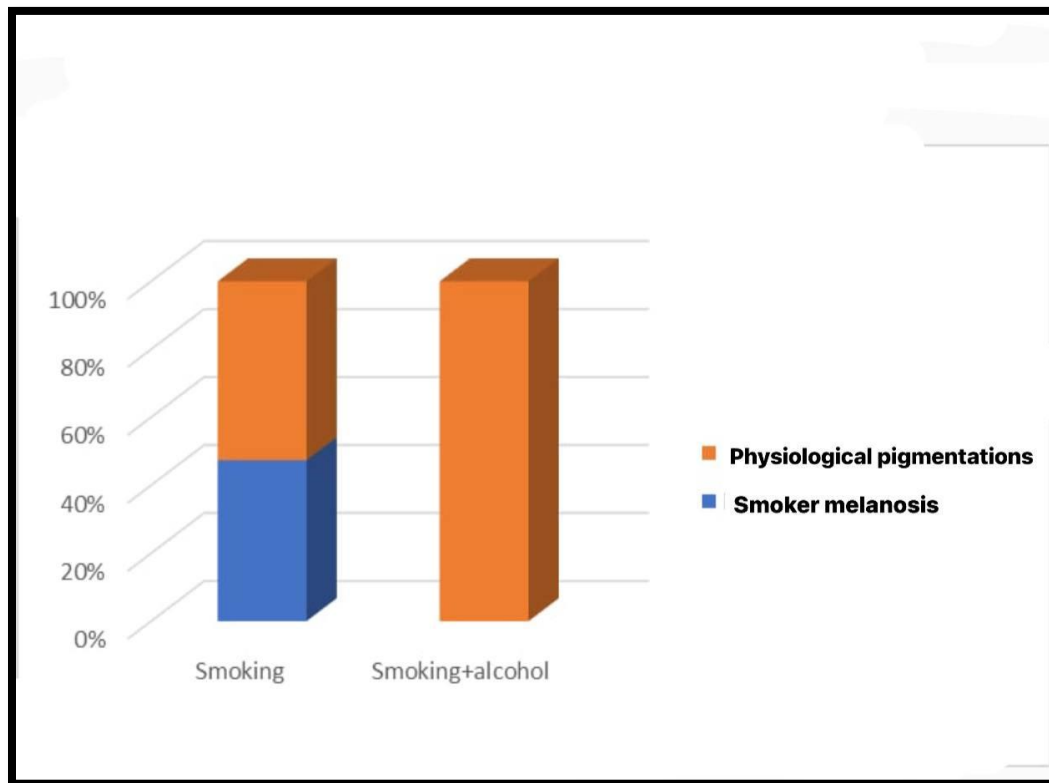


**Figure (16) the most common location of the oral pigmentations.**

### **3.5 Risk factors(smoking + alcohol )and oral pigmentations .**

According to the collected data (36%) of the examined dental students were smokers and only ( 1%) are alcoholics, **all** were males.

figure (17) shows relationship between smoking and the prevalence of oral pigmentations among those male students , (89%) of them were seen with physiologic pigmentations and (11%) of them were seen with smoker melanosis .



**Figure( 20) Risk factors and it's association with prevalence of oral pigmentations among dental students.**



**Figure (21) smoker melanosis seen in one of the examined dental students**

## Chapter four

**Discussion and conclusion**

## 4.1 Discussion

The mucous membranes lining the oral cavity are not uniformly colored and dependent upon the specific anatomic location; healthy tissue commonly ranges in color from white to red-purple (Kauzman et al,2018).

In this study a sample of 100 dental students were taken to study the prevalence of oral pigmented lesions.

It has been found that (31%) of the students were with oral pigmentations. The most common type were the physiological pigmentations.

Females were the most affected gender. Which agrees with a previous study done by Aubrey Masilana et al. (2015), who study the physiological oral melanin pigmentation in a South African sample.

There's a clear association between smoking and the prevalence of smoker melanosis among dental students.

Approximately, (89%) of smokers were seen with smoker melanosis. All of them were males. This finding corresponds to previous studies have been done in India to assesses the prevalence of oral lesions among tobacco users that showed a greater number of affected males when compared with females.

It also agrees with a previous study that was made in 2012 by santhosh et al., that found significantly greater number of smokers exhibited pigmentation than nonsmokers.

In the present study it was found that there is no association between the previous covid-19 infection or its vaccine and medications with the presence of oral pigmentations among dental students. None of the participants reported a change in the oral cavity color neither after covid-19 infection or its vaccine and medications.

This disagrees with a retrospective study concluded by Chandran et al., in 2016, which showed that the immunoinflammatory processes have been associated with hyperpigmentation of melanin from the oral mucosa.

In the present study it was found that (69%) of dental students were with an average age of (21 ) years, showed no history of intraoral pigmentations; which in line with another study that were made by Leticia Ferreira et al. in 2010; that demonstrated the main affect age by oral pigmentations being ranged from (51-60) years.

In which it agrees with a previous study that was made in 2012 by santhosh et al . That clarified significantly greater number of smokers exhibited pigmentation than nonsmokers.

This project also concluded that the most affected site by oral pigmentations in the oral cavity is the labial attached gingiva with a percentage of (67%) followed by the buccal gingiva (28%).This agrees with a previous study done by Dr. Blanas et al. in 2011; it showed that the labial attached gingiva being the most affected site for the oral pigmentations .

## **4.2 Conclusion**

From the results obtained in this study it can be concluded that:-

- 1-Generally (31%) of the students were seen with oral pigmentations.
- 2-Females were mostly affected with psychological pigmentations.
- 3- Males were mostly affected with smoker melanosis.
- 4-No oral pigmentations were seen associated with previous Covid-19 infection

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# Appendix I

University of Baghdad

College of Dentistry

Dept. of Oral Diagnosis/Oral Medicine Clinic



## Case Sheet

"ORAL LESIONS"

جامعة بغداد

كلية طب الأسنان

فرع التشخيص القسي / عيادة طب الفم

Case No. ....

## survey

PATIENT'S NAME : ..... AGE: ..... GANDER: .....  
ADDRESS: ..... OCCUPATION: ..... PHONE NO: .....

### Medical history:

-Cardio vascular diseases	No	Yes.....
-Hematologic diseases	No	Yes .....
-Respiratory diseases	No	Yes.....
-Gastrointestinal diseases	No	Yes.....
-Neurological diseases	No	Yes.....
-Urinary diseases	No	Yes.....
-Allergy	No	Yes.....
-Hospitalization & pregnancy	No	Yes.....

### About COVID-19:

-previous COVID-19 infection	No	Yes , medication.....
-the date of COVID-19's infection		.....
-D-dimer level	High	Low

### -risk factors:

1- smoking	No	Yes , how many a day?..... ,since?.....
2-alcohol	No	Yes, how many a day?.....,since?.....

### VACCINE SHOTS

First:

Second:

Third:

## Oral examination

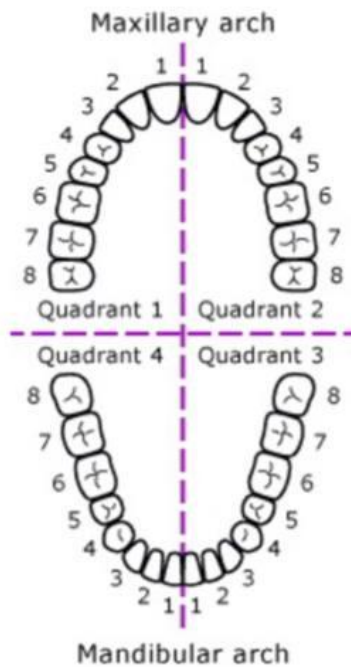
### Pigmented lesion examination:

History of the pigmented lesion :-

- since when it's present?.....
- Is it painful?.....
- Is there's any associated lymph nodes?.....

### -location :

-Buccally	R.side	L.side
-labiall	R.side	L.side
-palate	Hard	Soft
-floor of the mouth	Yes	No
-tongue	Dorsal	Ventral



-distribution :- Single Multiple

-Shape:

- Round
- Oval
- Irregular

-Color of the lesion

- brown
- Black
- Blue
- Black

DONE BY: ZAINAB TAHER  
SUPERVISED BY: DR. AMENNA RAYHAN

