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Clinical Characters in Diabetic Patients affected by Oral fungal Infection in Dhi-Qar City

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Abstract

Background:

Different studies conducted nationally and internationally to find out the different factors for oral fungal infection in the diabetic patients. The connection between hyperglycemia and fungal infection has been studied extensively. However, this issue is underexplored in Dhi-Qar context. This study aimed to investigate the incidence of oral fungal infections among patients with diabetes were diagnosed and treated in Alnassiryia Diabetes center , Alnassiryia teaching hospital and Consultant Clinics in Dentistry College in Dhi-Qar city.

Method

This is a cross-sectional, study was conducted on Diabetic patients from different healthcare centers , living in different areas in Dhi-Qar governorate. It was carried out during the period from first of November 2021 to 20th of February 2022, where a 145 diabetic patients of both sexes ,who previously diagnosed with diabetes, presented with various oral cavity and other systemic diseases, were enrolled in this study by using simple random sampling technique , and the oral cavity for each one was examined clinically . Data were collected through a predesigned questionnaire covering medical history of diabetes with multiple demographical and clinical characteristics of patients and , Microsoft Excel for Window version 2010 was used for data management and descriptive statistics were analyzed by SPSS version 20.0.

Results:

The current work found that there were significant associated of a state of poor or bad oral hygiene , and type of diabetes therapy especially in those patients that used life style changes , or those using insulin with
oral hypoglycemic drugs on the risk of oral fungal infection.
The older the patient , comorbidities as respiratory tract infections , Cardiovascular system infections , Gastrointestinal tract infections , and kidney diseases and the smoking type social habit for diabetes patients , the higher probability they get oral fungal infection ($p<0.05$).

Conclusions:

Oral fungal infection is prevalent, while presence of poor or bad oral hygiene , and type of diabetes therapy along with poor glycemic control and with the higher age group of the patients presence of comorbidities , and those of smoking type social habit . are the most important factors affecting the incidence of fungal infections in oral cavity.

1. INTRODUCTION

Diabetes mellitus (DM) is a most common endocrine metabolic disorder with severe impact on health systems worldwide, marked by elevated levels of blood sugar and the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the metabolism of carbohydrates, lipids and proteins.. There are currently two main etiologies of diabetes i.e. the hypo-secretion of insulin from pancreas and the reduced sensitivity of body cell toward insulin [1,2]. Diabetes has three main subtypes. Type 1 DM (juvenile diabetes) mostly occurred in young people below the age of 30 years. Type-2 diabetes mellitus (adult onset diabetes) often occurred in obese patient above the age of 30 years . Gestational diabetes occurred in the pregnant women without the prior history of diabetes [3]. In 2017, the prevalence of adult-onset diabetes globally (20–79 years) was equal to 425 million, and by 2045 the World Health Organization and the International Diabetes Federation predicted that the percentage of adults with diabetes worldwide will rise by approximately 629 million [4]

Diabetes mellitus is a chronic disease whose prevalence is increasing worldwide [5,6], Type 2 diabetes mellitus has been described as a new epidemic [7] .

Comparison of recent research reveals that diabetes prevalence continues to rise quickly. Diabetes raises death risk by 2-fold. Between 2012 to 2015, there were about 1.5 to 5.0 million mortality due to diabetes each year [8].

Diabetes mellitus is one of the main risk factors of fungal infections of oral cavity , especially candidiasis is the most severe fungal infection of diabetic patients, found in the oral cavity with the wipe able white plaques, i.e. tongue buccal mucosa, palate, gingivae and mouth surface [9,10,11],lower part of gastrointestinal tract, skin, foot, urogenital

system and blood and affects virtually all tissues and organs the body . [12, 13]

Different studies conducted nationally and internationally to find out the different factors for oral fungal infection in the diabetic patients [14,15]. The major predisposing factors are decreased salivation, poororal hygiene, glycemic control, smoking, duration of diabetes, type of therapy and xerostomia [16, 17].

The connection between diabetes and oral fungal infections has been studied extensively [16, 18-19], Respiratory tract infections as Bacterial pneumonia correlates with oral fungal infections especially candidiasis [20 , 21].

2. Objectives

This study aimed to investigate the prevalence of oral fungal among patients with diabetes and its relationship with factors such as the age of selected groups of patients , the gender , the residence , the types of diabetes , type of diabetes therapy , comorbidities , duration of the disease ,social habits and state of oral hygiene,who reviewed to healthcare centers as Alnassiryia teaching hospital , Alnassiryia diabetes center , and consultant clinics in Dentistry College in Dhi-Qar city .

3.Patients & Methods

This is a cross-sectional, community- based prospective study was conducted on patients with different types of diabetes mellitus living in different areas of Dhi Qar city . It was carried out during the period from first of November 2021 to 20th of February 2022.

A 145 Diabetic patients were enrolled in this study by using simple random sampling technique , and the oral cavity for each one was examined clinically . The data were collected by a predesigned pretested questionnaire prepared specifically to suit this study. This structured questionnaire form was used to interview the patients to include the study variables , as the age , gender , residence , type of diabetes mellitus , types and duration of diabetes therapy , comorbidities , social habits , and state of oral hygiene .The data were collected using a predesigned pretested data collection forms , and analyzed by using a statistical software program, each data collection forms were reviewed for clarity and completeness using Statistical Package for Social Science (SPSS) version 21.0 (IBM SPSS INC., Chicago, IL). All data gathered via data collection forms were coded into variables. Both descriptive and inferential statistics, including Chi square, were performed to present the results .

4. Results

4.1.Distribution of diabetes patients with subject characteristics

A selected patients with different types of diabetes was studied according to the various parameters , the results are as follow and shown in(figures 1,2 , 3,4.5.6)

4.1.1.Distribution by age :

The majority of the selected patients belonged to the age group between 45 to 60 years (41.4%), whereas patients above 60 years constitutes the least group (27.6%)..

4.1.2.Distribution by gender : Female predominates Males amongst the patient population(62.1%).

4.1.3. Distribution by residence

Most patient with diabetes mellitus were included in this study
were live in urban region (52.4%).

4.1.4. Distribution by Comorbidities :

Majority of diabetes patients presented with comorbidities (63.4%) as respiratory system diseases , Cardiovascular diseases, Gastrointestinal diseases , Kidney diseases ,and Other discomforts .

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4.1 .5. State of oral hygiene :

Majority of diabetes patients were selected presented with Poor (bad)oral hygiene (66.9%).

4.1.6. Types of social habits :

Large number of diabetes patients were selected in this study are nonsmokers or nondrinkers (87.6%)

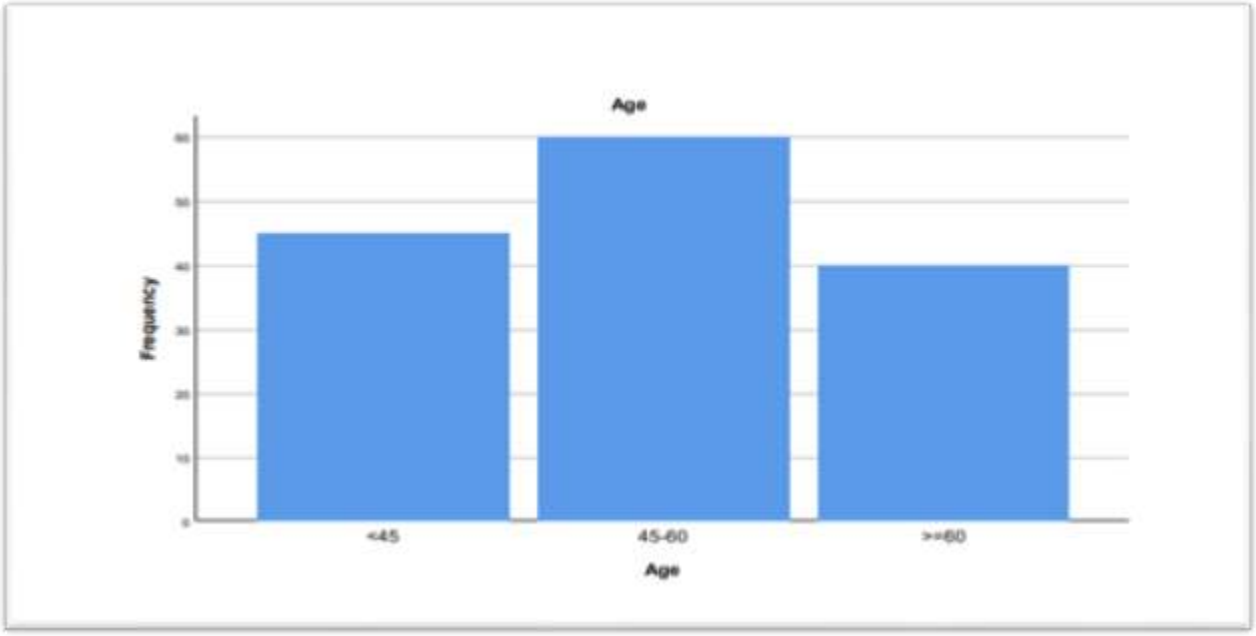

Figure (1): Distribution of Age Categories of Selected Patients.

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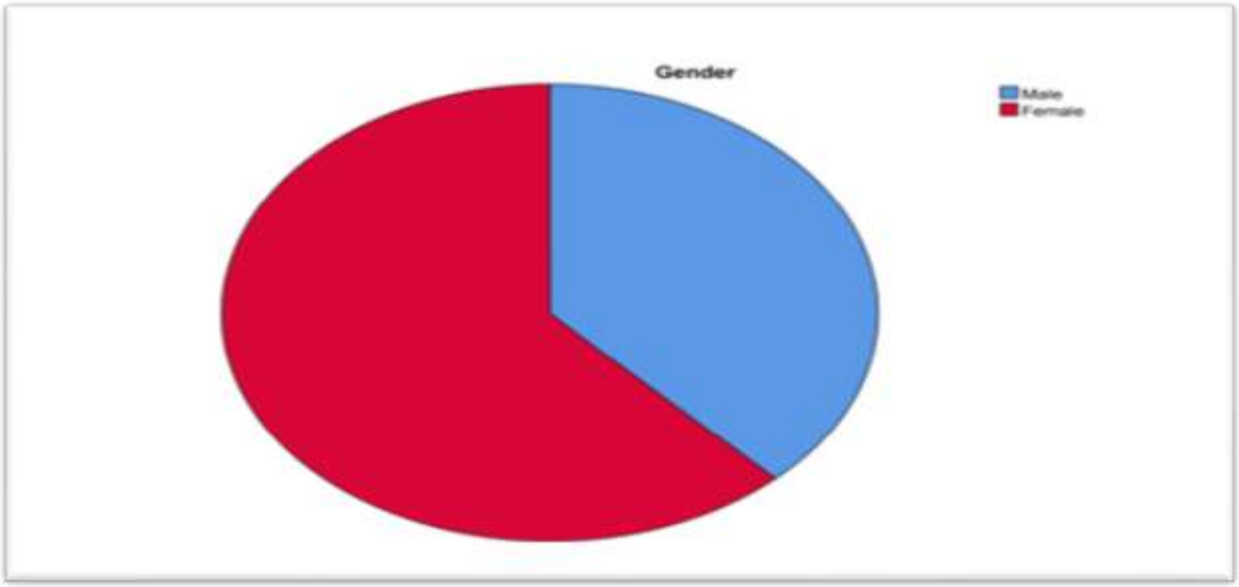

Figure (2): Gender Distribution Of The Selected Patients.

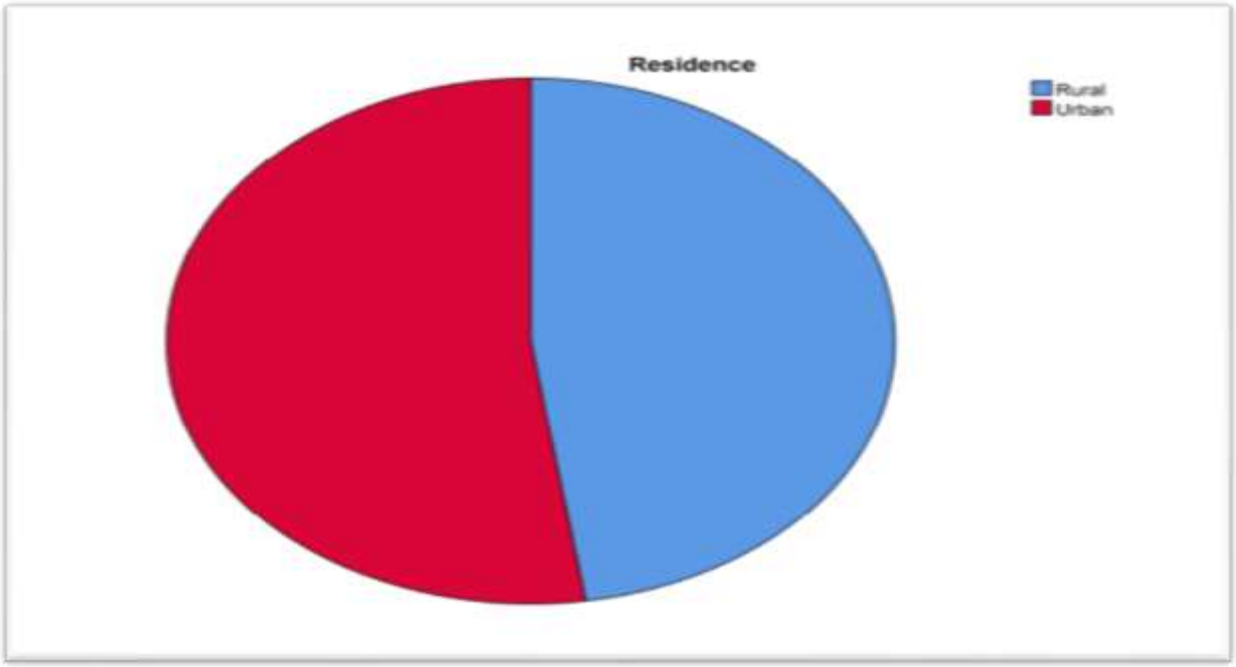

Figure (3): Residence Distribution of the Selected Patients.

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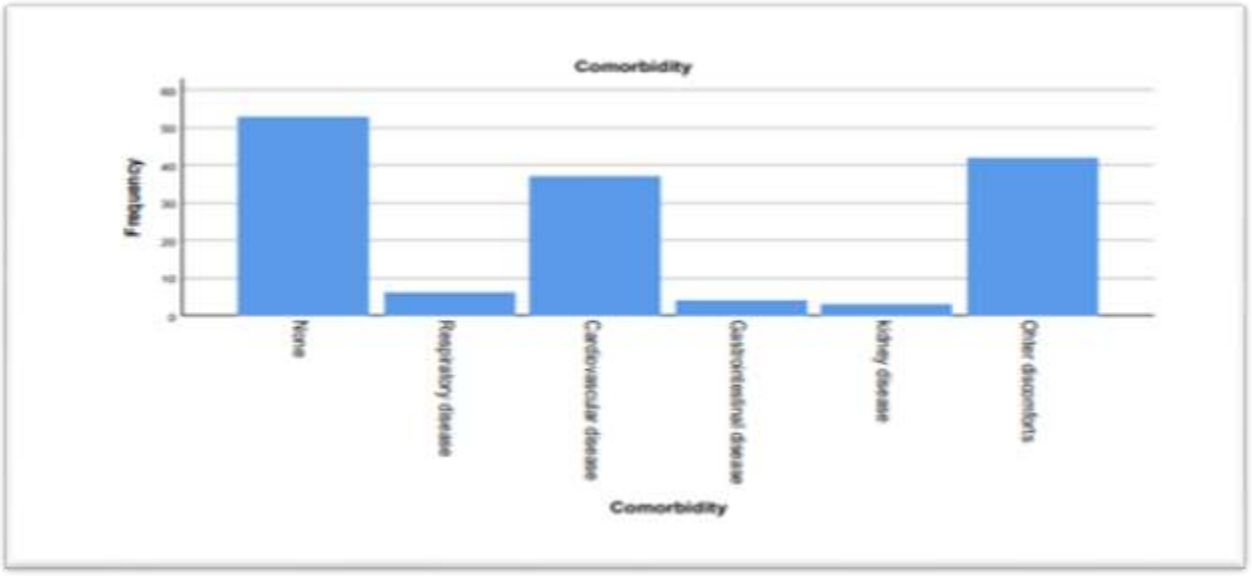

Figure (4): Distribution of Comorbidities among selected Diabetes Patients.

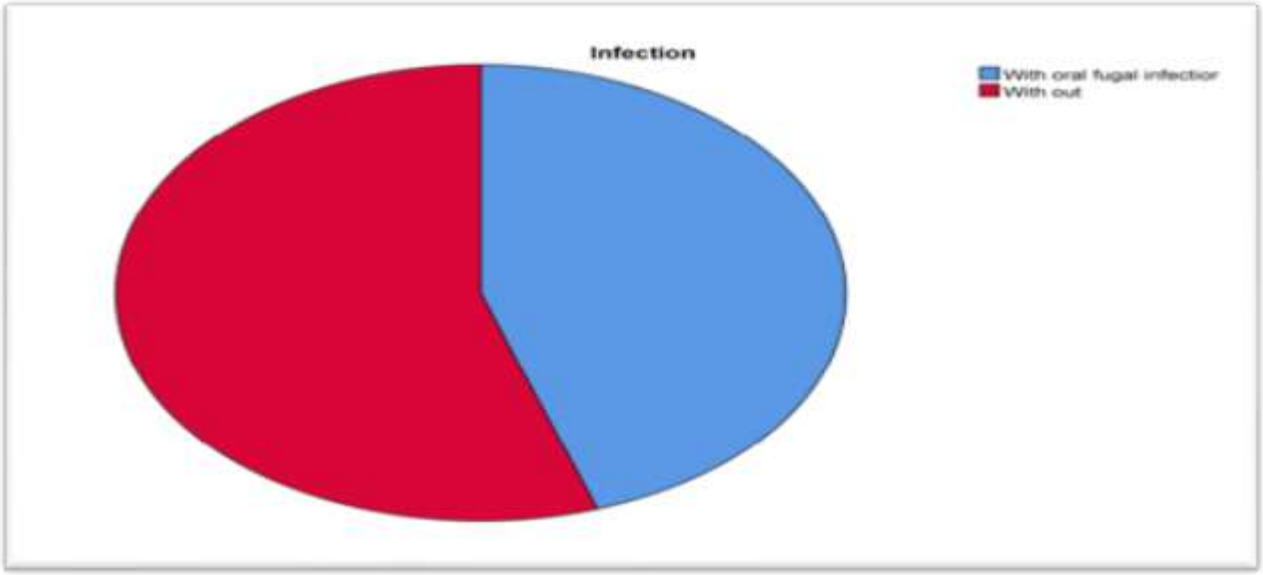

Figure (5): State Of Oral Hygiene Among Selected Diabetes Patients.

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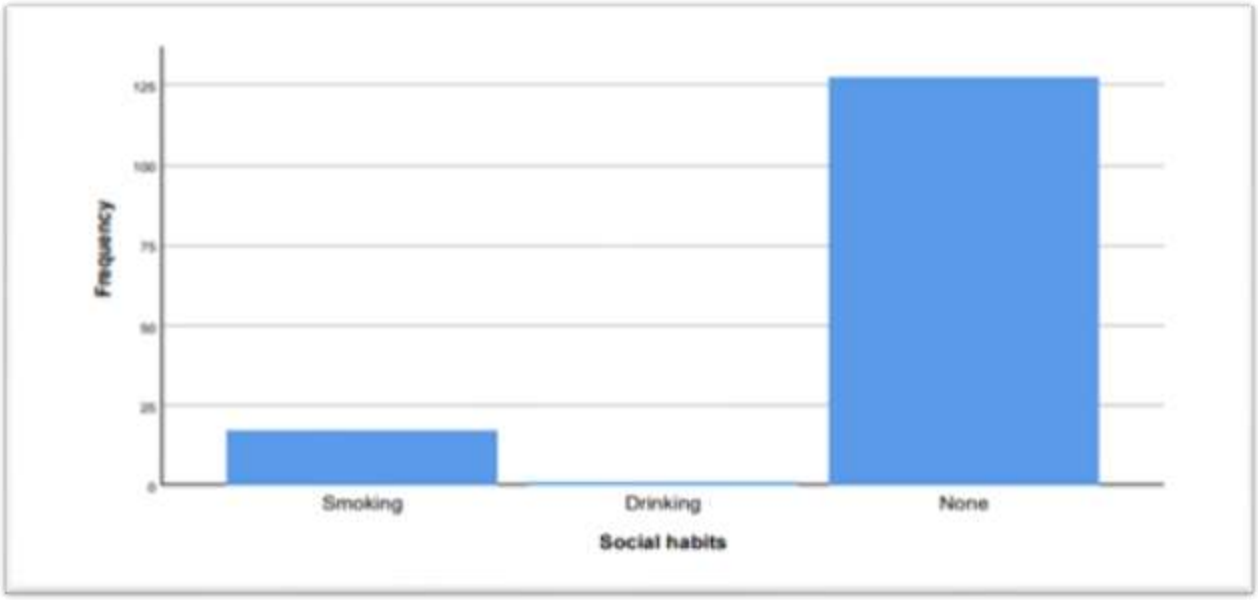

Figure (6): Distribution of Types of Social Habits for Selected Diabetes Patients.

4.2.Distribution according to diabetes characteristics

This study shown the distribution of patients according to the types of diabetes , to the various ways of diabetes therapy, and to the duration of the disease , this shown in (figures 7,8,9)

4.2.1. Type of diabetes :

Majority of selected patient in this study were of type -2 diabetes (71.7%) .

4.2.2. Types of diabetes therapy :

Various type of diabetic therapy were used by the patients , about ((42.1%)) on insulin , where (26.2%) used oral hypoglycemia agents, and(24.8%)on oral hypoglycemia agents + insulin .

4.2.3.Duration of diabetes (years) :

Majority of patients were presented with diabetes in period from 5-10 (years (32.4%) ,while less in period more than 15 years (17.9%).

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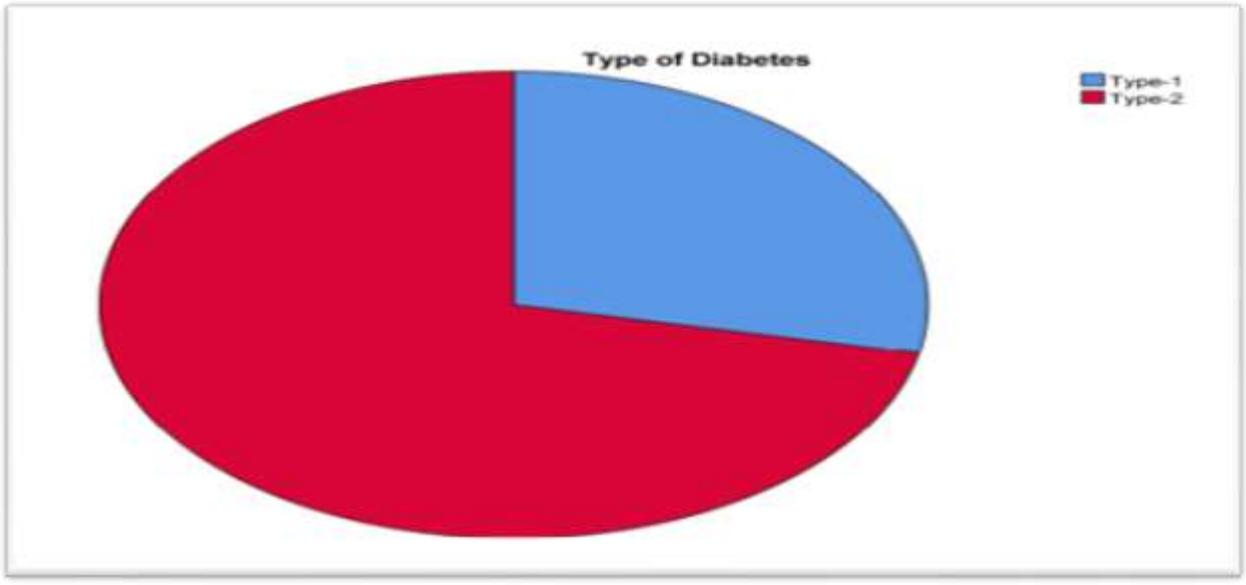

Figure (7): Type of Diabetes among Selected Patients.

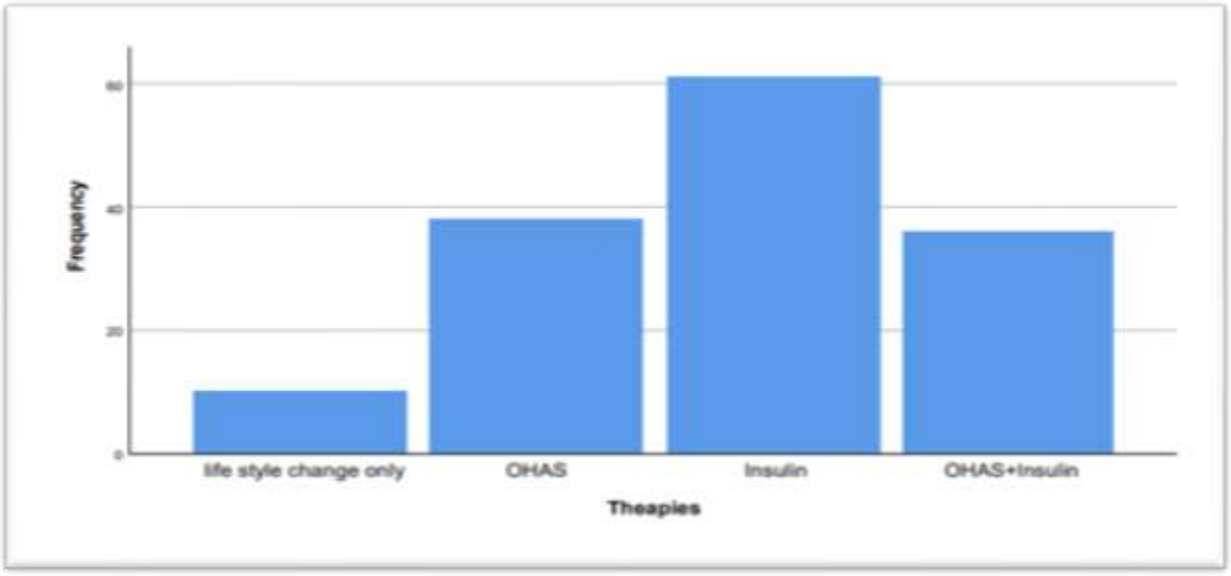

Figure (8): Distribution of Type Of Diabetes Therapy for Selected Patients

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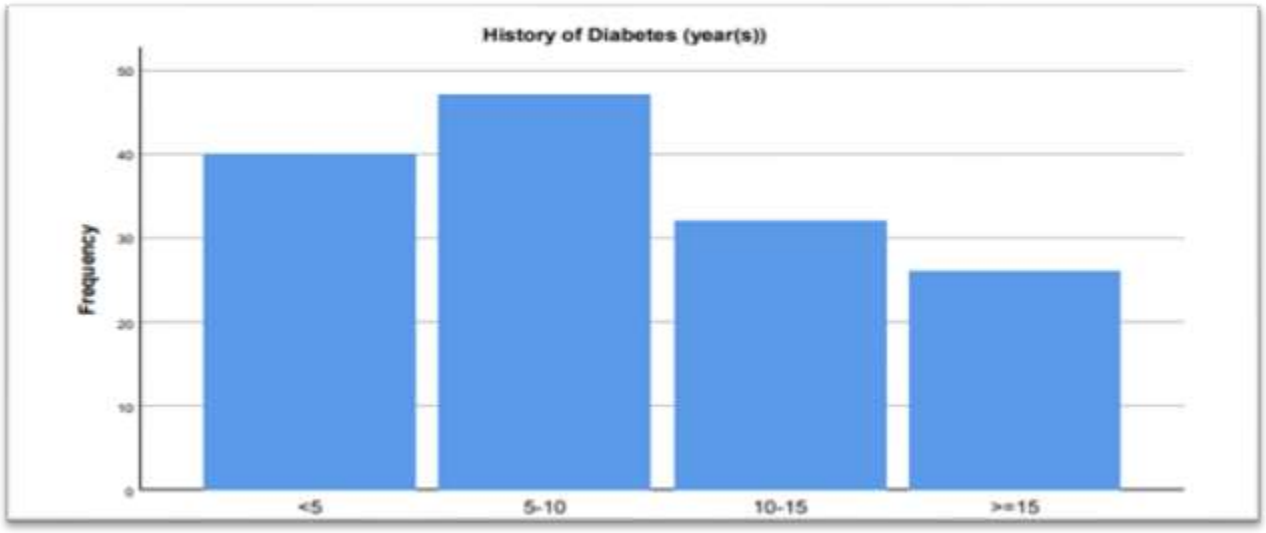

Figure(9) :Distribution of Duration of Diabetes (Years) among selected Patients.

4.3 .Reported oral fungal infection :

As shown in (table-1) , 65(44.8%) of total patients with diabetes were affected by oral fungal infection , higher probability in those with poor oral hygiene , and in those patients in age range 45- 60y ,diabetes patients on life style changes and those on insulin with oral hypoglycemic drugs are also show more with oral fungal infections . also there is higher probability in those patients were presented with comorbidities .

Table 1. Characteristics Of Patients With And Without Oral Fungal Infections(OFI) (N=145,, OFI N= 65 „No OFI N= 80)

Characteristic	OFL N=65 (44.8%)	No OFL N=80 (55.2%)
Age (Years Old)		
<45	15(33.3%)	30(66.7%)
45-60	33(55%)	27(45%)
≥60	17(42.5%)	23(57.5%)
Gender		
Male	24(43.6%)	31(56.4%)
Female	41(45.6%)	49(54.4%)
Residence		
Rural	31(44.9%)	38(55.1%)
Urban	34(44.7%)	42(55.3%)
Type Of Diabetes		
Type 1	15(36.6%)	26(63.4%)
Type 2	50(48.1)	54(51.9%)

Therapies		
Lifestyle Change Only	**6(60%)**	**4(40%)**
Oral Hypoglycemia Agents	**14(36.8%)**	**24(63.2%)**
Insulin	**24(39.3%)**	**37(60.7%)**
Ohas + Insulin	**21(58.3%)**	**15(41.7%)**
History Of Diabetes (Year(S))		
<5	**15(37.5%)**	**25(62.5%)**
5 -10	**23(48.9%)**	**24(51.1%)**
10-15	**15(46.9%)**	**17(53.1%)**
≥15	**12(46.2%)**	**14(53.8%)**
Comorbidity		
None	**18(34%)**	**35(66%)**
Respiratory Diseases	**2(33.3%)**	**4(66.7%)**
Cardiovascular Diseases	**20(54.1%)**	**17(45.9%)**
Psychology Diseases	**0(0%)**	**0(0%)**
Gastrointestinal Diseases	**3(75%)**	**1(25%)**
Kidney Diseases	**2(66.7%)**	**1(33.3%)**
Other Discomforts	**20(47.6%)**	**22(52.4%)**
Oral Hygiene: **Good Oral Hygiene**	**15(31.3%)**	**33(68.7%)**
Poor (Bad)Oral Hygiene	**50(51.5%)**	**47(48.5%)**
Social Habits :		
Smoking	**7(41.2%)**	**10(58.8%)**
Drinking Alcohol	**1(100%)**	**0(0%)**
None	**57(44.9%)**	**70(55.1%)**

shown in Figure (10). **4.4. Association of oral fungal infectionswith various subject characteristics:**

Application of statistical tests of association, Chi Square in particular, as a non-parametric test, among most of the variables (nominal or numerical) are dealt in this research, the following associations between variables are obtained. As follow:

4.4.1.Association with age :

Test of association between diabetic patients age and oral fungal infections showed that higher probability they get oral fungal infection ($p<0.05$).This result demonstrated that patients in age range 45- 60y who are the majority of selected patients also show more oral fungal infections . As

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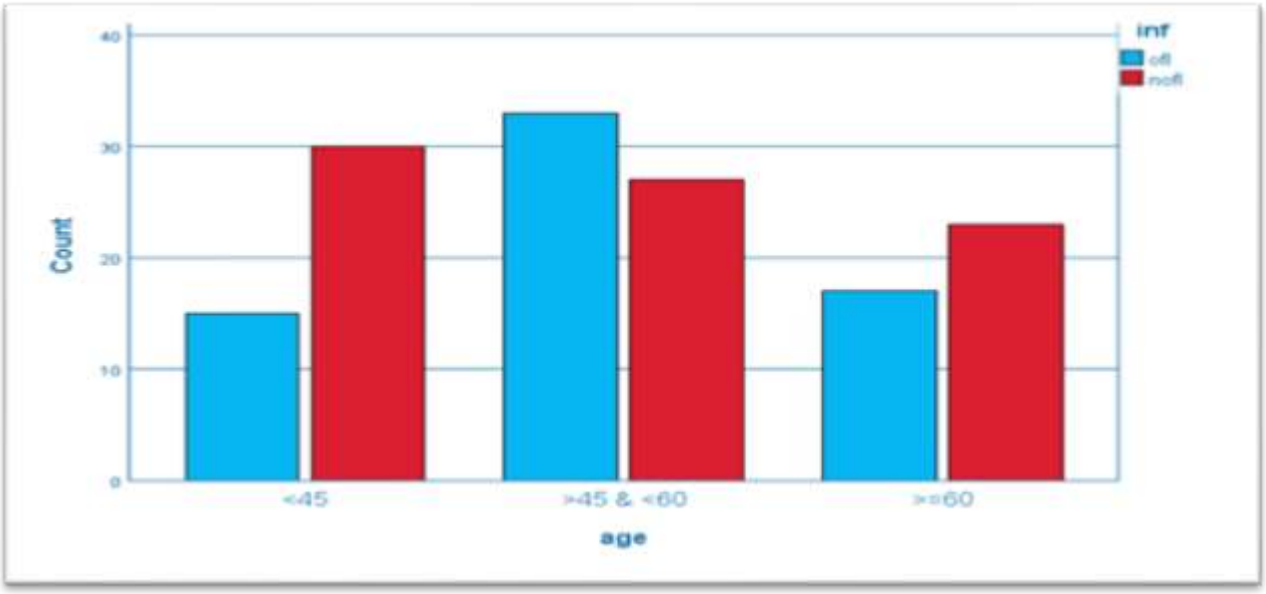
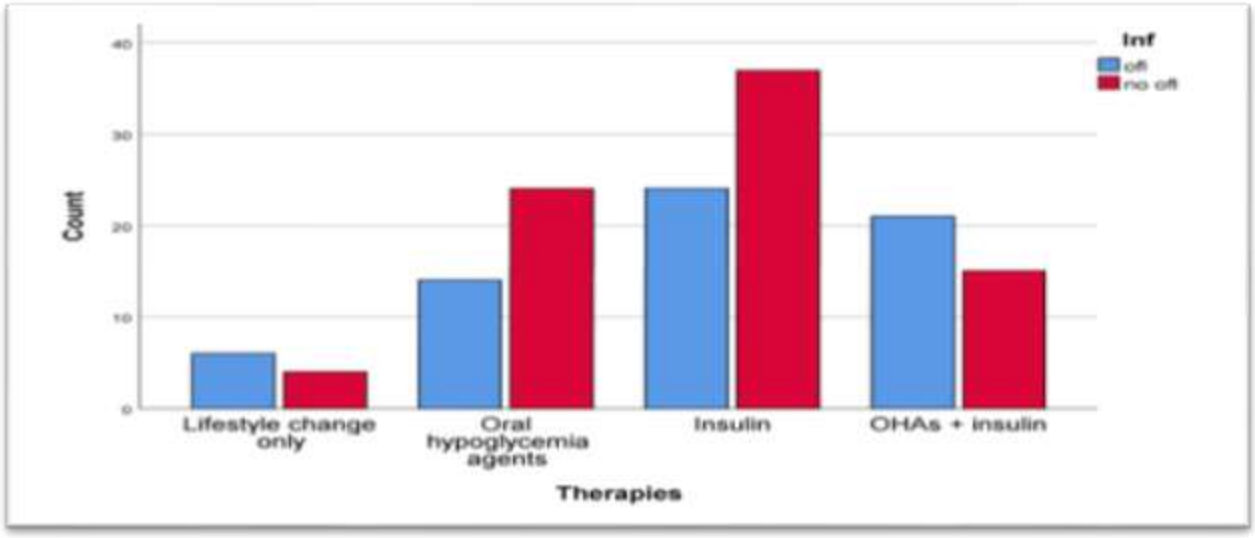


Figure (10): Association between diabetic Patients Age and Oral Fungal Infections.

4.4.2. Association with type of diabetes therapy :

With Figure (11) as obvious test of association showed that there is a significant (p>0.05) association between type of diabetes therapy and oral fungal infections. This result demonstrated that diabetes patients on life style changes and those on insulin with oral hypoglycemic drugs are also show more with oral fungal infections .

Type of diabetes therapy are the most important factors that may increase the presence of oral fungal infection , no matter what was the type of therapy among diabetes patients .



Figure(11): Association between Type Of Diabetes Therapy and Oral Fungal Infections.

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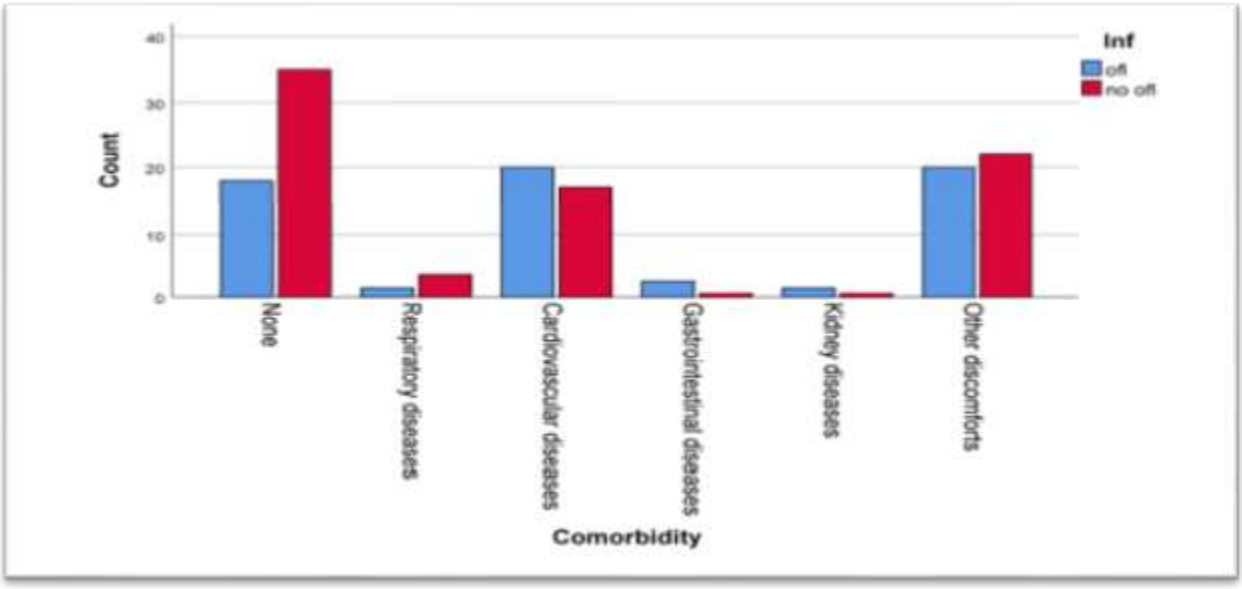
4.4. 3. Association with comorbidities :

With Figure (12) as obvious test of association showed that there is
higher probability that they get oral fungal infection ($p<0.05$) as they have comorbidities like respiratory tract infections , Cardiovascular system infections , Gastrointestinal tract infections , and kidney diseases and oral fungal infections .



Figure(12): Association between the Comorbidities and Oral Fungal Infections.

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4.4.4. Association with state of oral hygiene:

Test of association between the state of oral hygiene and oral fungal infections noted that there is a significant ($p>0.05$) relationship between the state of oral hygiene and oral fungal infections .

Poor or bad oral hygiene is another most important risk factor for developing fungal infections in oral cavity in diabetes patients, and those patients were complaining or presented with increase frequencies of oral fungal infections can be illustrated by the following chart. Figure (13).

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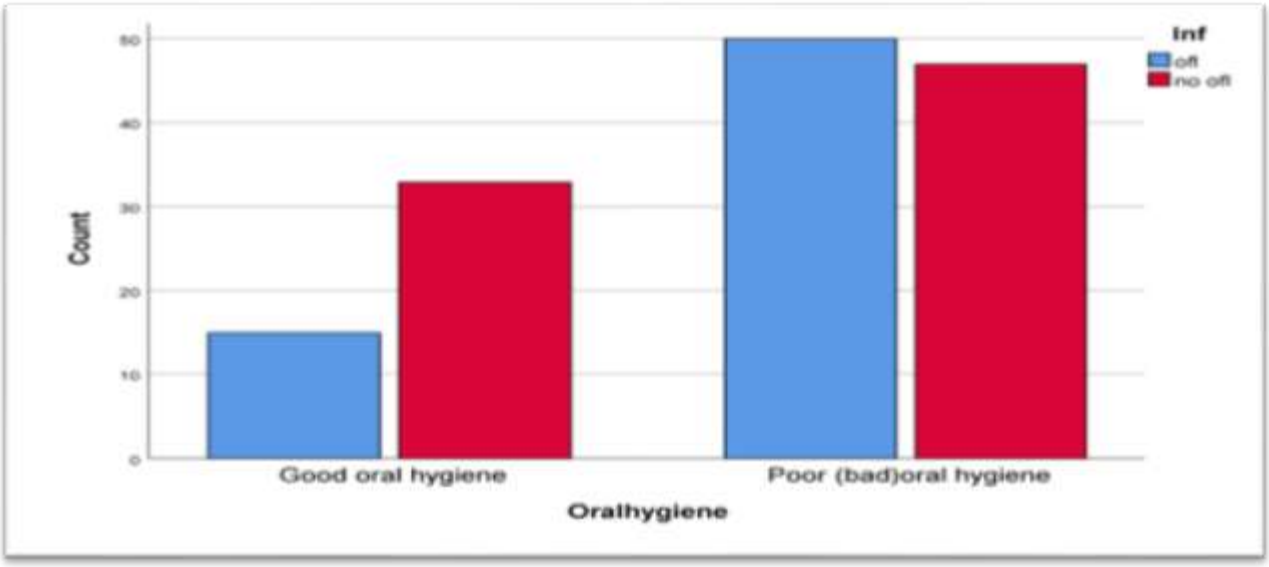
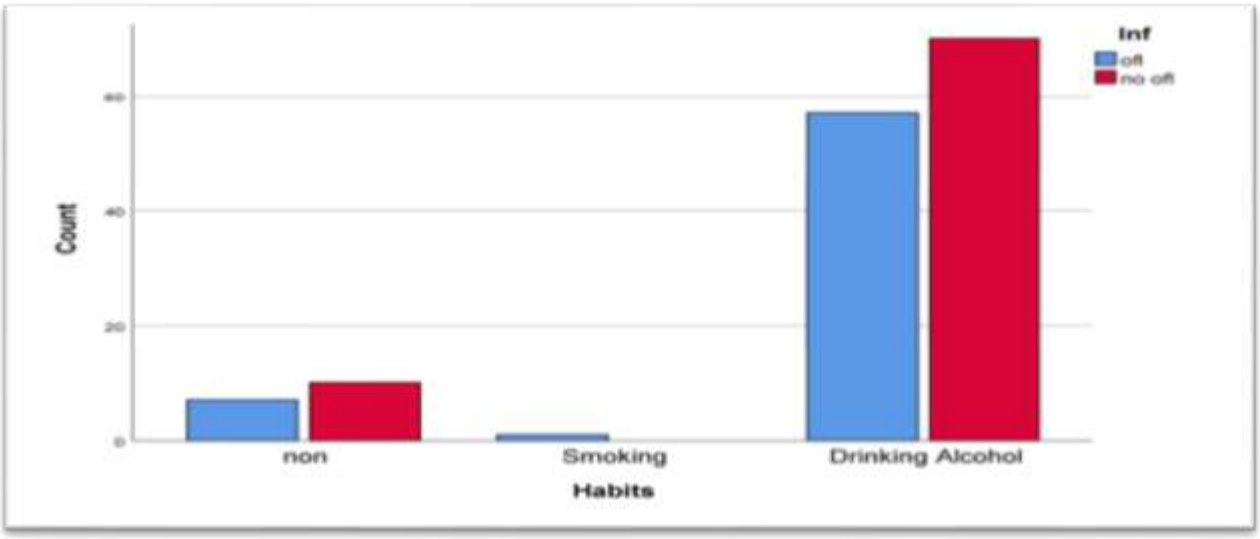


Figure(13):Association between state of oral hygiene and oral fungal infections

4.4.5. Association with social habits as smoking :

This work reveled those with smoking type social habit that have higher probability that they get oral fungal infection ($p<0.05$). As shown in Figure (14).



Figure(14): Association between Social Habits as Smoking and Oral Fungal Infections.

5. Discussion &Conclusions

Fungal infection in oral cavity become problem noticeable and prominent at the present time among risky diabetic patient as a result of different etiological factors , and the incidenceincreased with the duration of diabetes along with poor glycemic control and with the higher age group of the patients and with poor (bad) state of oral cavity hygiene[1]. Many studiesin most countries showed high prevalence diseaseswas significantly higher in diabetics than non-diabetics. [11]

In this study, we try to identify this problem in our community among patients were affected by various types of diabetes mellitus . prevalence of oral fungal infectioncarriers was 44.8 %, which is like to that found in other reports in western countries [21].

The current work is revealed that a state of oral hygiene with specificity to word poor or bad oral hygiene were the most frequently factor that presented as a risk factor for developing an oral fungal infections in selected diabetes patients (majority of them) , followed by the type of diabetes therapy , the most frequently reported therapy is those on life style changes , and those using oral hypoglycemic drugs with insulin at the same time .

Also this study shows that other risk factors for developing fungal infections in oral cavity inselected diabetes patients , as older age group especially those with age group or (45- 60y), presence of comorbidities , and those of smoking type social habit .

Predesigned pretested questionnaire , with clinical examination of oral cavity to risky diabetes patients , together with sample isolation (swab) and using an especial Chromo –agar technique is important in detecting a species of fungi especially types of candida in oral cavity

Moreover, oral fungal infections is prevalent,in diabetes patients in our city . It's with specific pattern and with different etiological factors . This pattern provided an important information about all cases of fungal infections that can be useful in establishing control programs for these infections in diabetes patient , and I hope that this study could be the primary resource not only for epidemiological research on fungi infection determinants but also for planning and evaluating health services for prevention , diagnosis and treatment of these diseases in Thi-qar city .12

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SUMMARY

This study was described the prevalence of oral fungal infections among selected Diabetic patients were living in different areas in Dhi - Qar governorate. It was carried out during the period from first of November2021 to 20th of February 2022, where a 145 Diabetic patients were enrolled in this study . Oral fungal infections in diabetes patients is widely prevalent, with specificity to word poor or bad oral hygiene were the most frequently factor that presented as a risk factor for developing an oral fungal infections in selected diabetes patients (majority of them) , followed by the type of diabetes therapy , the most frequently reported therapy is those on life style changes , and those using oral hypoglycemic drugs with insulin at the same time . Other risk factors for developing fungal infections in oral cavity inselected diabetes patients , as older age group especially those with age group (45- 60y), presence of comorbidities , and those of smoking type social habit .