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**PREVALENCE OF ROOT STUMPS IN DIABETIC PATIENTS
REPORTING TO DENTAL HOSPITAL - AN OBSERVATIONAL STUDY**

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ABSTRACT

Diabetes mellitus (DM) is a common chronic disorder which affects millions of people. At present, India has the highest incidence of diabetes worldwide. Several oral lesions and conditions are associated with diabetes. However, there is a lack of consensus among researchers regarding the relationship between diabetes mellitus and root stumps. Hence the present study was carried out to assess the prevalence of diabetes and root stumps in middle aged adults reporting to Saveetha dental college, Chennai. A hospital based observational study was conducted. All the case sheets of the dental patients for a period of 10 months [June 2019 to March 2020] were observed and the data of patients with coexisting diabetes mellitus and root stumps were gathered. The collected data were entered in an excel sheet and then statistically analysed. In this study, Patients between 30 to 50 yrs have more prevalence of diabetes mellitus and root stumps - 64 %. The gender of these patients were predominantly male - 68 %. The presence of root stumps in these patients was more prevalent in Sextant 1 and Sextant 3. More than 45 % of these patients have 3 to 4 root stumps in number. This study concluded that male diabetic patients have more root stumps in the oral cavity. More awareness is required to motivate the patients for the removal of root stumps and subsequent replacement.

Keywords: Diabetes; Root stumps; Removal of root stumps; Awareness

1. INTRODUCTION

Diabetes mellitus is a common chronic metabolic disorder affecting millions of people. According to the world health organization [WHO], Any disease having a prevalence of more than 1 % should be considered as a disease of public health importance [1]. The prevalence of diabetes for all age groups worldwide was estimated to be 2.8 % in 2000 and may reach 4.4 % by 2030 [1]. The overall prevalence of diabetes is increasing globally. India, with 32 million diabetic individuals currently has the highest incidence of diabetes worldwide [2]. These numbers are predicted to increase to 80 millions by the year 2030 [3]. The two broad categories of DM are Type 1 and Type 2 diabetes mellitus. Type 2 diabetes mellitus which is characterized by increased blood glucose level and obesity is mostly seen after 30 yrs of age [4].

It is well known that oral health and general health are inseparable [5]. Oral cavity and contagious structures can be dramatically affected by diabetes and diabetics are more prevalent to infections [7, 8] and other medical conditions. These oral complications have important effects on the quality of life of patients with diabetes and can also directly and indirectly affect glycemic control [9, 4]. Oral lesions and conditions associated with

diabetes includes, Root stumps, Dental caries, Xerostomia, Burning mouth, Gingivitis, Periodontal diseases, etc. [6, 7]. The relationship between diabetes and dental caries, particularly among adults, has received less attention so far despite the fact that both the diseases are associated with ingestion of carbohydrates [12, 13]. The insulin deficiency in diabetes may lead to hyposalivation and elevated salivary glucose level, which may put diabetes patients at a risk of developing caries.

Root stumps are completely broken crown of the tooth and leaving the radicular part behind which will be present in the gums. These root stumps are due to several coronal and root caries. These root stumps are needed to be extracted followed by subsequent replacement [14 – 20]. The choice of replacements on the site of root stumps extraction should be planned accordingly [21 – 25].

2. MATERIALS AND METHODS

The study was done in a university setting with available data of similar ethnicity. Samples of a period of 10 months June 2019 to March 2020 were reviewed. Data with inclusion of diabetes and root stumps were collected. All available data were included without any sorting process to minimise

sampling bias. Internal validity was non-inclusion probability and homogenization and replication of experiment were the external validity.

The data from 86, 000 patients visited Saveetha dental college during the time period of June 2019 to March 2020 were reviewed. The data of the patients with coexisting DM and root stumps were collected. Non specific samples were excluded from the study. The data was verified by an external reviewer. The verified data were entered in an excel sheet. Then the data were exported for statistical analysis. SPSS by IBM was the statistical software used and Chi - square test was the test done after defining the variables. Keeping age, gender, ethnicity as independent variables and Diabetes mellitus and root stumps as dependent variables, correlation and association types of analysis were done.

3. RESULTS AND DISCUSSION

Among the reviewed data, 25 patients have coexisting diabetes mellitus and root stumps. Patients aged between 30 to 50 yrs have more prevalence to diabetes and root stumps - 64 % (Table 1). Among these patients,

Males are more prevalent (68 %) than Females (Table 2). The presence of the root stumps were prevalent in Sextant 1 and Sextant 3 (Table 4). 44 % of patients have 2 to 3 root stumps in number (Table 3).

In this study , 32 % of these patients were less than 40 yrs old , 32 % were 41 to 50 yrs old , 16 % were 51 to 60 yrs old and 20 % were above 60 yrs old (Figure 1). 68 % of these patients were male and 32 % of them were female (Figure 2). Number of root stumps, 24 % have one root stump, 20 % have 2 root stumps, 20 % have 3 root stumps, 24% have 4 root stumps and 8 % of them have more than 4 root stumps (Figure 3). 20 % of patients have root stump in Sextant 1, 12 % in Sextant 3 , 4 % in Sextant 4 , 8 % of them have RS in Sextant 6 , 12 % have in Sextant 1 & 3 , 8 % have in Sextant 1 & 4 , 4 % have in Sextant 1 & 6 , 4 % in Sextant 4 & 6 , 4 % in Sextant 5 & 6 and around 20 % of the patients have root stumps in more than two Sextants (Figure 4). A statistically significant difference was observed between the sextants with respect to the number of root stumps present. (Pearson Chi square test; $P < 0.05$) (Table 5), (Figure 5).

Table 1: Represents the Age of the Patients

AGE	FREQUENCY	PERCENT
< 40 yrs	8	32
41 - 50 yrs	8	32
51 - 60 yrs	4	16
> 60 yrs	5	20
TOTAL	25	100.0

Table 2: Represents the Gender of the Patients

GENDER	FREQUENCY	PERCENT
Male	17	68
Female	8	32
TOTAL	25	100.0

Table 3: Represents the No. of Root stumps

NO. OF ROOT STUMPS	FREQUENCY	PERCENT
1	6	24
2	5	20
3	6	24
4	6	24
> 4	2	8
TOTAL	25	100.0

Table 4: Represents the Sextant

SEXTANT	FREQUENCY	PERCENT
Sextant 1	5	20
Sextant 3	3	12
Sextant 4	1	4
Sextant 6	2	8
Sextant 1 & 3	3	12
Sextant 1 & 4	2	8
Sextant 1 & 6	1	4
Sextant 4 & 6	1	4
Sextant 5 & 6	1	4
Sextant 1 , 2 & 6	1	4
Sextant 1 , 3 & 6	2	8
Sextant 1 , 4 & 6	1	4
Sextant 2 , 4 & 6	1	4
TOTAL	25	100.0

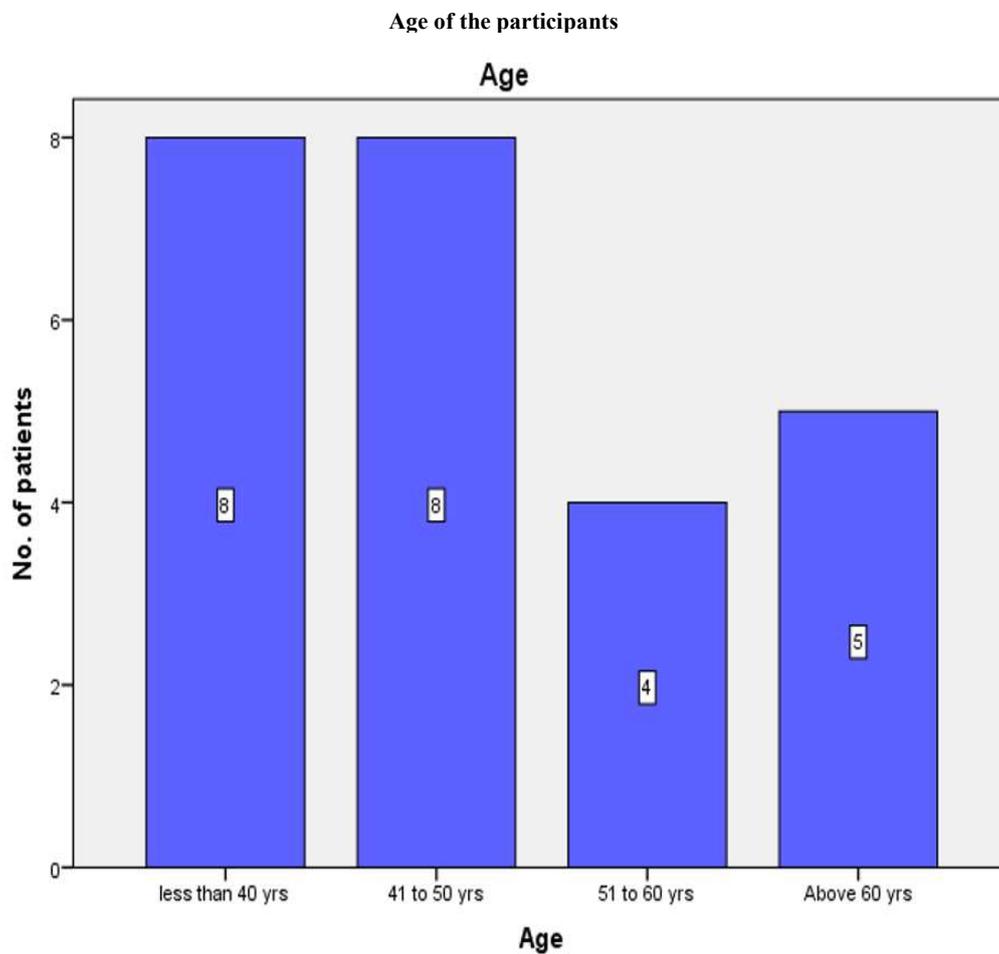


Figure 1: The bar graph represents the age of the patients . The X - axis represents the Age group and the Y - axis represents the No. of patients . 32 % (8) of the patients were < 40 yrs old , 32 % (8) were 41 to 50 yrs , 16 % (4) were 51 to 60 yrs and 20 % (5) were > 60 yrs old . Patients aged between 30 to 50 yrs have more prevalence to diabetes and root stumps - 64 % . N = 25.

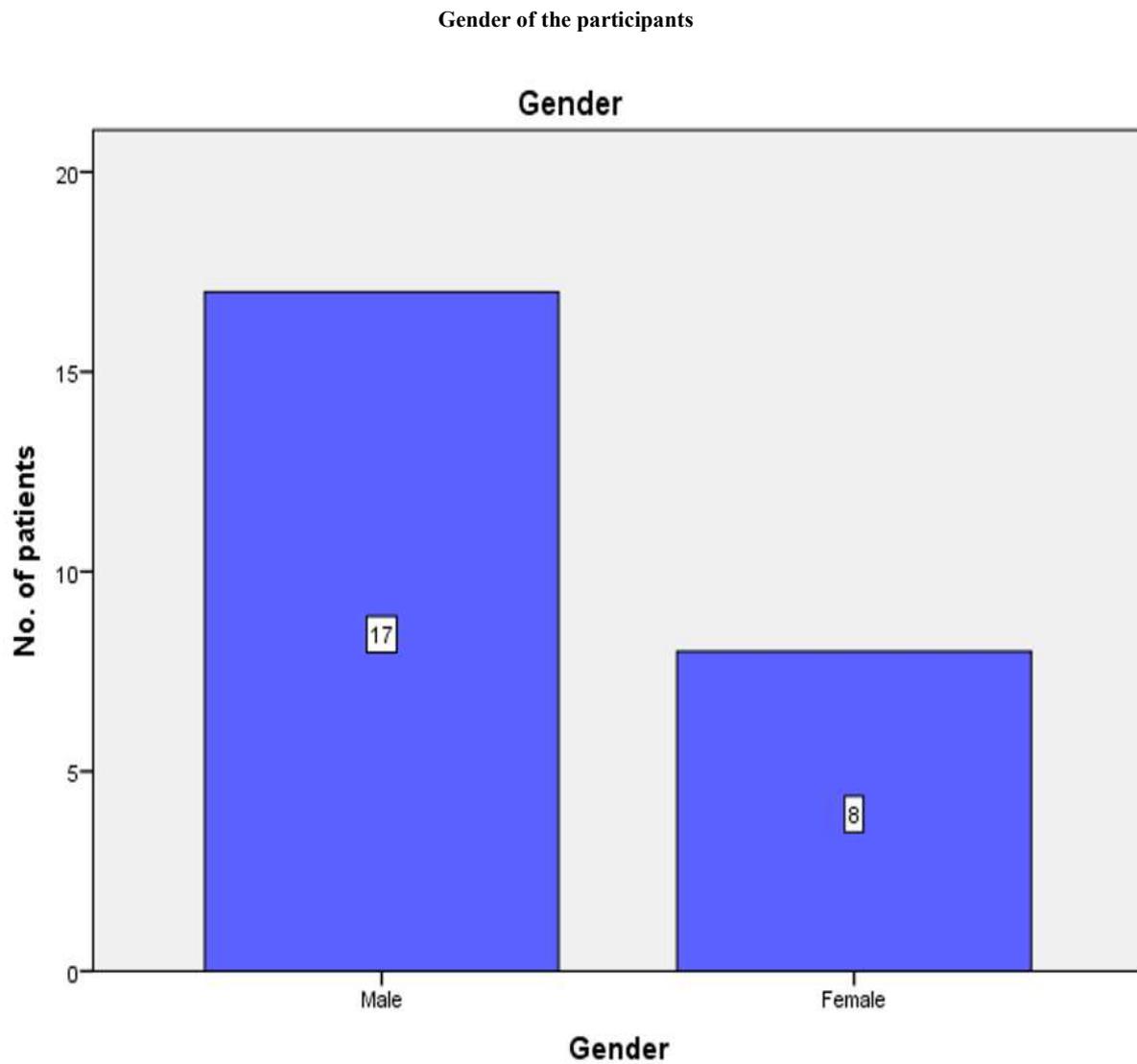


Figure 2: The bar graph represents the gender of the patients . The X - axis represents the Gender and the Y - axis represents the No. of patients . 68 % (17) were Male Patients and 32 % (8) were Female patients . Thus Males have more prevalence to Diabetes and Root stumps (68 %) . N = 25 .

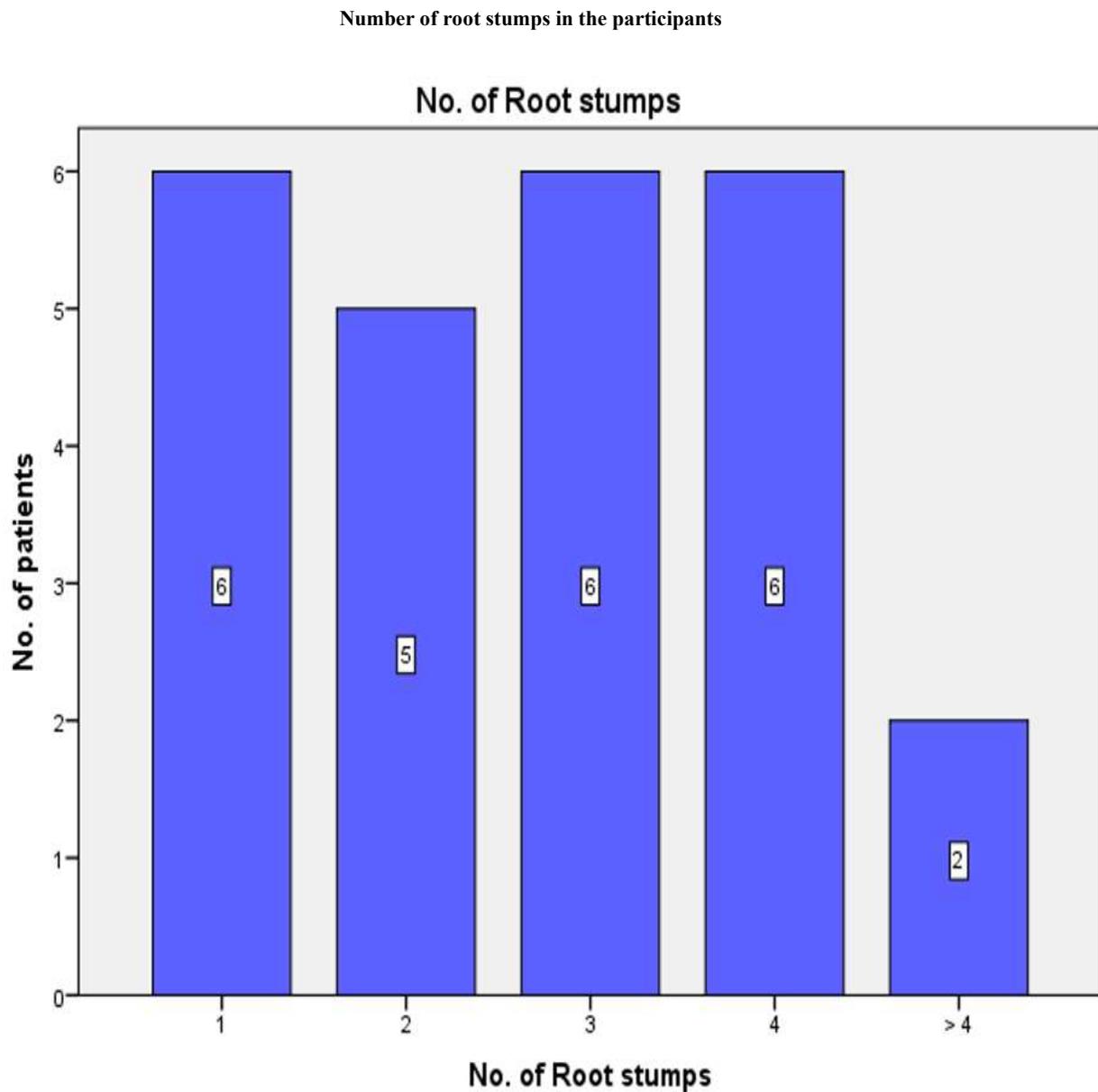


Figure 3: The bar graph represents the No. of root stumps in the patients. The X - axis represents the No. of root stumps in the patient and the Y - axis represents the No. of patients . 24 % (6) have 1 root stump , 20 % (5) have 2 root stumps , 24 % (6) have 3 root stumps , 24 % (6) have 4 root stumps and 8 % (2) have more than 4 root stumps. Thus 44 % of the Patients have 2 to 3 root stumps. N = 25 .

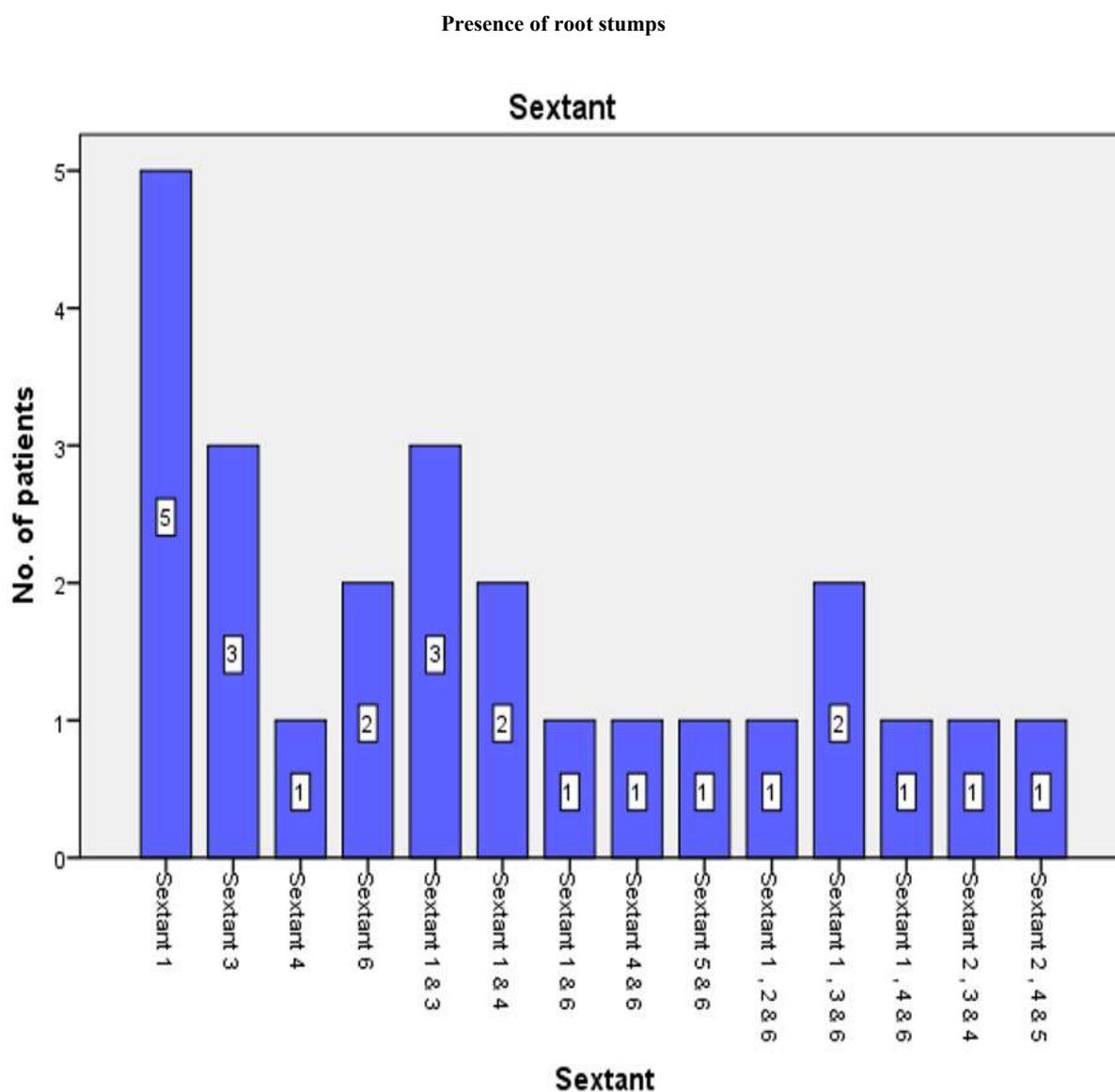


Figure 4 : The bar graph represents the Teeth sextants of the root stumps . The X - axis represents the Sextant and the Y - axis represents the No. Of patients . 20 % (5) of patients have RS in Sextant 1 , 12 % (3) in Sextant 3 , 4 % (1) in Sextant 4 , 8 % (2) of them have RS in Sextant 6 , 12 % (3) have in Sextant 1 & 3 , 8 % (2) have in Sextant 1 & 4 , 4 % (1) have in Sextant 1 & 6 , 4 % (1) in Sextant 4 & 6 , 4 % (1) in Sextant 5 & 6 and around 20 % (5) of the patients have root stumps in more than two Sextants . The presence of the root stumps were prevalent in Sextant 1 and Sextant 3 (52 %) . N = 25 .

Root stump distribution in various sextants

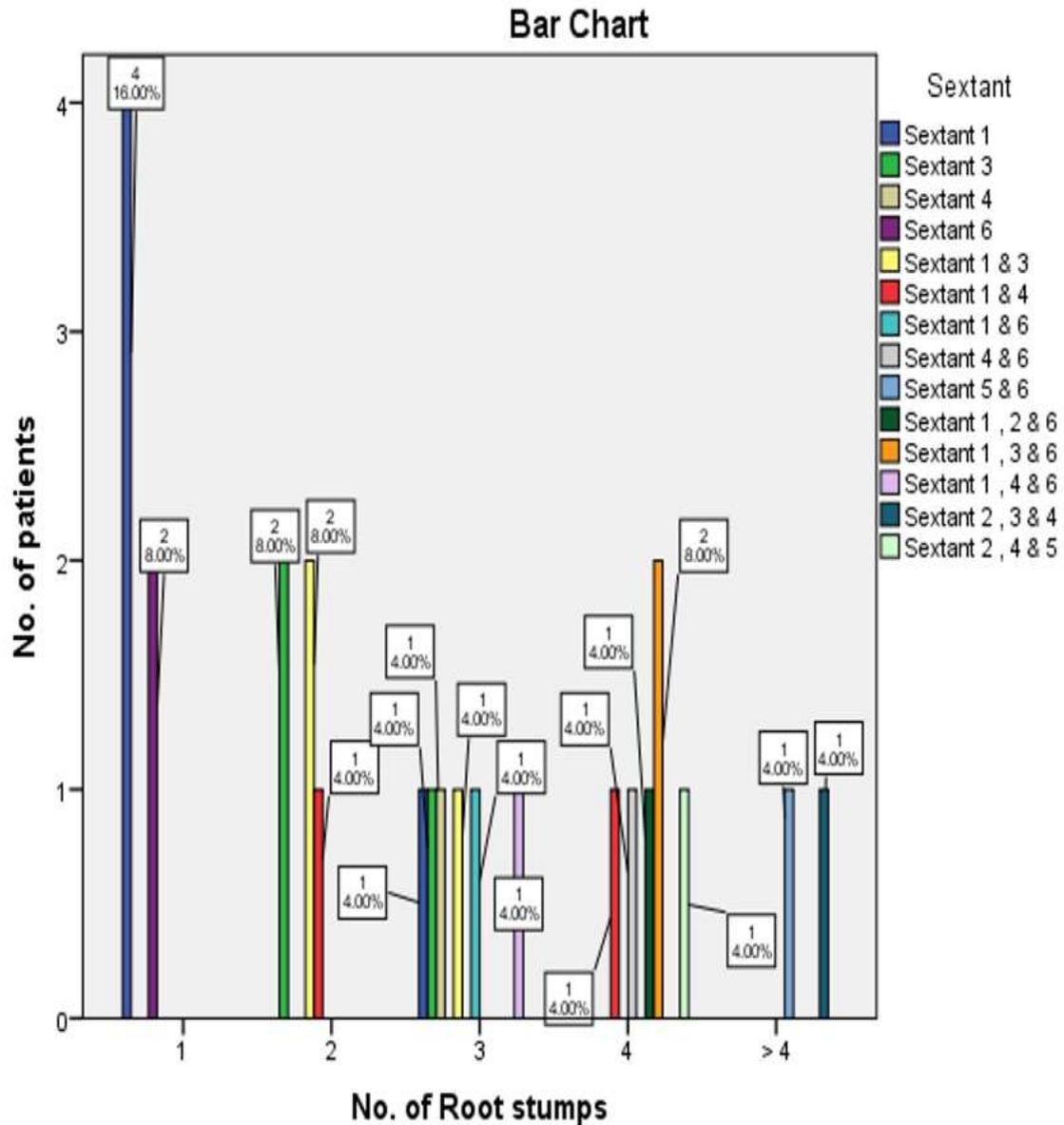


Figure 5 : The bar graph represents the association of No. of root stumps and the Teeth sextant . The X - axis represents the No. of root stumps and the Y - axis represents the frequency of Teeth sextants such as Sextant 1 (Blue) , Sextant 3 (Light Green) , Sextant 4 (Tan yellow) , Sextant 6 (Violet) , Sextant 1 & 3 (Yellow) , Sextant 1 & 4 (Red) , Sextant 1 & 6 (Mint Green) , Sextant 4 & 6 (Grey) , Sextant 5 & 6 (Sea blue) , Sextant 1, 2 & 6 (Dark green) , Sextant 1, 3 & 6 (Orange) , Sextant 1, 4 & 6 (Purple) , Sextant 2, 4 & 6 (Pine green) and Sextant 2, 4 & 5 (Seafoam green) . The presence of the root stumps were more prevalent in Sextant 1 and Sextant 3 compared to the other sites and 44 % of the Patients have 2 to 3 root stumps . This association was statistically significant . $p = 0.01$ (Pearson Chi square test; $P < 0.05$)

The purpose of this study was to assess the prevalence of root stumps in the adult population with Diabetes mellitus. Diabetics exist in sufficient numbers so as to be important and accessible to study [8]. The prevalence of dental caries and root stumps on the general population is of significant public interest [9]. Reduction of untreated dental caries and root stump extractions are a consequence of dental caries among adults by 15 % are among the healthy people 2010 objectives for oral health.

4. CONCLUSION

This study concluded that male diabetic patients have more root stumps and sextants 1 and 3 were the common sites of root stump presence in the oral cavity . More awareness is required to motivate the patients for removal of Root stumps and subsequent replacement . Close collaboration between the patients , health care units and oral health professionals could be a way of improving diabetic patients general and oral health .

5. ACKNOWLEDGEMENT

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6. CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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