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## Digit Sucking Habit And Association With Dental Caries And Oral Hygiene Status In Children

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**Abstract:** A habit is a routine of behavior or doing that is repeated regularly and tends to occur unconsciously. Oral habits such as thumb sucking, nail and finger biting, tongue thrusting, lip biting , bruxism, etc can produce deleterious and destructive effects on the oral structures. A patient's oral health can be affected by these adverse habits. Thumb/digit sucking habit is the repeated and forceful sucking of the thumb with associated buccal and lip musculature. Dental caries is a common problem to any dentition, at any age group. They are most prevalent in cases with poor oral hygiene maintenance. The aim of this study is to assess the association between oral hygiene and DMFT index with dental caries, in children with digit sucking habits. A retrospective study was done in an institutional setting to study the relation between oral hygiene status and dental caries in patients with digit sucking habits. All patients (age group of 18 and less) who had visited the hospital from June 2019 to April 2020 were taken into consideration. The case sheets of all the patients were analyzed using the parameters such as gender, OHIS, DMFT. The data was tabulated and statistical analysis was done in SPSS. Analysis of gender with DMFT and OHIS were done. Out of the 18 patients with digit sucking habits, 11 of them were male and 7 of them were females. Majority of the patients had a really low score on the DMFT index. 0-5 was the lowest and 15 patients had this score. 8 patients had OHIS between 0.6-1. Male patients were seen to have higher DMFT and OHIS than female patients. There was no significant relation between digit sucking habit and dental caries. Oral hygiene played a big role in the occurrence of dental caries.

**Keywords:** Children; Dental caries; Digit sucking; Habit; Hygiene

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### INTRODUCTION

A habit is a behavior or act that is repeated regularly and has become an unconscious act, and automatic. Many of them can affect our day to day life or even the quality of our life(Puskaric, Tadic and Djordjevic, 2016). Damaging oral habits such as thumb sucking/digit sucking, mouth breathing, tongue thrusting, lip biting, etc are also such habits that are detrimental to our oral health. They are acquired automatisms that occur due to an altered pattern of muscle contraction and will proceed unconsciously on a regular basis.

Oral habits can be of two types: Functional and Parafunctional. Functional habits occur due to repeating of normal and functional acts (chewing, breathing, etc). Parafunctional habits occur due to nonfunctional and unnecessary actions (thumb sucking, lip biting, etc).(Govindaraju, Jeevanandan and E. Subramanian, 2017; Ravikumar, Jeevanandan and Subramanian, 2017)(Christabel and Linda Christabel, 2015)(Packiri, Gurunathan and Selvarasu, 2017) Deleterious oral habits have limited effects on an individual's health, but play a major role in altering the position of the teeth, interferes with the normal growth of jaws and function of the orofacial musculature(Puskaric, Tadic and Djordjevic, 2016; Dutta and Verma, 2018)(Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017b),

The factors that determine the effect of oral habits have on the individuals oral health include duration of the habit per day, degree and intensity of the habit(Kamdar and Al-Shahrani, 2015). Oral habits are considered as an abnormal act if it persists after the age of three. They are one of the most important and common etiological factors. In developing malocclusion and other ill effects on orofacial structures(Govindaraju, Jeevanandan and E. Subramanian, 2017).

There has been a wide range of prevalence of oral habits between population, race and countries. It is affected by gender, number of children in the family, feeding habits, socioeconomic status. (I. Sharma et al., 2019) The prevalence of oral habits have decreased in present days.

Nonnutritive sucking such as digit sucking is a common behavior during childhood. Etiological factors for the habit include fatigue, boredom, excitement hunger, fear, physical/emotional stress, etc. it is said that it may provide happiness and a sense of security for the child (Kolawole et al., 2016) (Jeevanandan, 2017) (Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017a) (Jeevanandan and Govindaraju, 2018) (Veerale Panchal, Jeevanandan and Subramanian, 2019) (Nair et al., 2018). Thumb sucking is considered as one of the most common forms of oral habits (Shetty, Deoghare and Shridhar Shetty, 2015; Kolawole et al., 2016). Changes that are associated with digit sucking include increased maxillary arch length, proclination of incisors, overjet, decreased overbite, posterior crossbite. Prolonged digit sucking can cause permanent damage to digit/fingers, necessitating corrective surgery.

To eliminate digit sucking habits, would include direct counselling of the patients by the dentist, reminder therapy (in the form of a band aid or finger guard), orthodontic appliance treatments (fixed or removable) (Tanaka et al., 2016) Dental caries is a multifactorial disease that affects individuals globally. Factors like the individual's sugar consumption, frequency of meals, oral hygiene practices, etc play a role in its prevalence (Elamin, Garemo and Gardner, 2018).

The aim of this study is to assess the relation between dental caries and oral hygiene in children who have digit sucking habits. This study will help better plan a course of treatment for patients with the adverse habit. This study will aid dentists to have precautionary steps to ensure patients are caries free. It will help to better frame a course of treatment in patients with digit sucking habits. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu et al., 2019; Mehta et al., 2019; P. Sharma et al., 2019; Rajendran et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Varghese, Ramesh and Veeraiyan, 2019; V. Panchal, Jeevanandan and Subramanian, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020)

## **MATERIALS AND METHOD**

A retrospective study was conducted in an institutional setting. The ethical clearance was received from the institution's ethical committee (ethical approval number- SDC/ SIHEC/ 2020/ DIASDATA/ 0619-0320). The study involved all patients of 18 years and below who were diagnosed with digit sucking habits in a given time frame.

### **Selection of subjects:**

All patients who were diagnosed with digit sucking habits were considered for this study. The patients had to be 18 years and below. The time period of choice was June 2019 to April 2020. There were three people involved in this study: the guide, reviewer and researcher. All available data was collected and sorted.

### **Data collection:**

The detailed case sheets of all the patients were analyzed with parameters such as age, gender, DMFT score and OHIS score. Cross verification of the data was done by the second reviewer to avoid any missing and repeated data. The data was manually retrieved and tabulated in Excel and sorted. Intraoral photographs were also used to verify the data.

### **Inclusion criteria:**

All patients below 18 years who were diagnosed with having digit sucking habit were considered for this study

### **Exclusion criteria:**

Incomplete data in the case sheets were excluded from the study. Repeated data was also excluded.

### **Statistical analysis:**

The tabulated data was analyzed using SPSS software (IBM SPSS software 26.0). The method of analysis that was used was the "Chi square test". The analysis was done between gender and DMFT, gender and OHIS & OHIS and DMFT.

## **RESULTS AND DISCUSSION**

The present study was done to determine the association between oral hygiene and the presence of dental caries in children with digit sucking habits.

### **Data analysis:**

All the data was analyzed with the "Chi square test" in SPSS software. The comparison was done between:

- Gender and OHIS
- Gender and DMFT

## OHIS and DMFT

Frequency analysis was also done.

Gender, OHIS score and DMFT score distribution:

A total of 18 patients below the age of 18 years were recorded to have been diagnosed with a digit sucking habit. 11 male patients and 7 female patients were included in this study. This is tabulated in Figure 1.

DMFT values were grouped into three: 0-5, 6-10 and 11-15. 15 patients had a DMFT score of 0-5. 2 patients with 6-10 and 1 patient between 11-15. Majority of the patients had a minute number of decays (83.3%). The results are tabulated and represented in Figure 2.

OHIS scores were grouped into four: 0-0.5, 0.6-1, 1.1-1.5 and 1.6-2. 44.1% of the patients (8 patients) had a score between 0.6-1. The least number of patients (1 patient- 5.6%) had a score in between 1.6-2. The data is tabulated and represented in Figure 3.

Analysis between gender and DMFT score:

There were more male patients than female patients who had a DMFT value of 0.5; 9 male patients and 6 female patients. ( $p$  value > 0.05). The results are tabulated and represented in Figure 4.

Analysis between gender and OHIS score:

Males were seen to have a better OHIS score than females in this study. Majority of the patients (6 patients) had an OHIS score of 0.6-1. Majority of the female patients (4 patients) had an OHIS score between 1.1-1.5. The data was tabulated and illustrated in Figure 5. ( $p$  value > 0.05)

Analysis between OHIS and DMFT:

Table 6 and Figure 6 shows the relation between DMFT and OHIS. This showed that patients with an increased OHIS score don't necessarily have a lot of decayed teeth. Majority of the DMFT scores are in 0-5 and the OHIS score for these patients fall in the 0.6-1 category. ( $p$  value > 0.05)

From the results seen in the present study, there were significantly more male children with better DMFT and OHIS scores. This ultimately states that male patients had a better maintenance of their oral hygiene than female patients. There was no significant relation between digit sucking habit and the oral hygiene of the children. Anticipating dental problems and taking precautionary, prophylactic measures is important, especially in growing children, to ensure good oral health. This would require proper knowledge of the relationship between oral hygiene and malocclusions.

Dental caries are considered as the most prevalent chronic diseases worldwide ('Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review', 2018)(Somasingh et al., 2015). It's an infectious disease that is multifactorial in nature, that leads to the destruction of dental hard tissues. Its prevalence has been associated with socioeconomic and demographic factors as well as behavioral aspects.(Veiga et al., 2016)

It is a known fact that female individuals tend to take care of themselves more than males. They are more self-conscious and aware of esthetics more than males. In the present study, 61.1% of the children who were diagnosed with digit sucking habits were seen to be male patients. The remaining 38.9% were females. More number of male children were diagnosed with the adverse habit as compared to females. In a similar study assessing the prevalence of oral habits in patients done in 2018, it stated that 53.8% patients who had been diagnosed with oral habits were females. (S.Anila et al)(Veiga et al., 2016; Anila et al., 2018). This study goes against the present study, as females tend to have a higher prevalence rate for oral habits. One such study that agrees with the current study was done by Pradeep Visnoi et al(Shyagali et al., 2017) in 2017. This study stated that there was a higher number of male patients that were diagnosed with oral habits than females.

Dental caries are more prevalent in children than in older age groups(Subramanyam et al., 2018). This could be due to the increased rate of awareness of oral hygiene in older aged individuals(Marwah et al., 2018)(Govindaraju and Gurunathan, 2017). In the present study, the DMFT values which the majority of the patients seemed to have been diagnosed with was 0-5. Younger children had higher values of 6 and above. The prevalence of dental caries would differ between individuals of different age groups, gender, and socioeconomic status. A similar study done by Kola Reddy et al(Reddy et al., 2017) in 2017, stated that the prevalence of dental caries was more in patients of 7-8 years as compared to older ones. This could be due to the increased sugar intake in school going children when compared to others.

Oral hygiene status is one of the factors that can determine the prevalence of dental problems in children and adults. Higher OHIS can mean that the individual has poor oral hygiene as compared to those from well-educated and aware families. In the present study, the majority of the patients had an OHIS score between 0.6-1. This showed moderate oral hygiene was there for the children. The study conducted by Shivananda Gudal et al(Soumya, 2017) stated that older children tend to have better OHIS scores as compared to younger ones.

It is said that female patients tend to maintain their oral health better than male patients, in this study, it's seen that male patients were more prone to having higher values in the DMFT and OHIS evaluation. As per the results, 1 out of 11 patients who were male had the highest DMFT score of 11-15, whereas none of the female patients had this score. 1.6-2 was the highest OHIS score to be evaluated. 1 male patient was seen to have this score and no female patients had it. A study done in 2016, stated that females tend to have better oral hygiene as

compared to males. They tend to have less prevalence of dental caries as a result (Margaritis, Mamai-Homata and Koletsi-Kounari, 2016).

DMFT and OHIS indexes are two of the most important quantitative factors that measure tooth health and oral hygiene. In the present study, it was seen that there was no relevant correlation between OHIS score and DMFT score. Most of the patients had an OHIS score of 0.6-1 and DMFT score of 0-5, which was considered as having moderate oral hygiene. In another study done by Luijeta et al (Website, no date), the average DMFT value of children between 10-15 years was 2.8, and OHIS score was 1-4. There was a strong correlation between DMFT and OHIS. Patients with poor oral hygiene score had more decayed teeth.

#### **Study limitations:**

The study took into account only one particular oral habit. It focused on only one particular area or locality and had a small sample size.

Future scope for the study:

Future studies in this topic can take into consideration the various oral habits that are present in children. A bigger sample size can be considered as well. Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)

#### **CONCLUSION**

Within the limits of the study, it was seen that there was no relevant correlation between digit sucking habit and the prevalence of dental caries. Dental caries and poor oral hygiene was more prone in male patients than in female patients.

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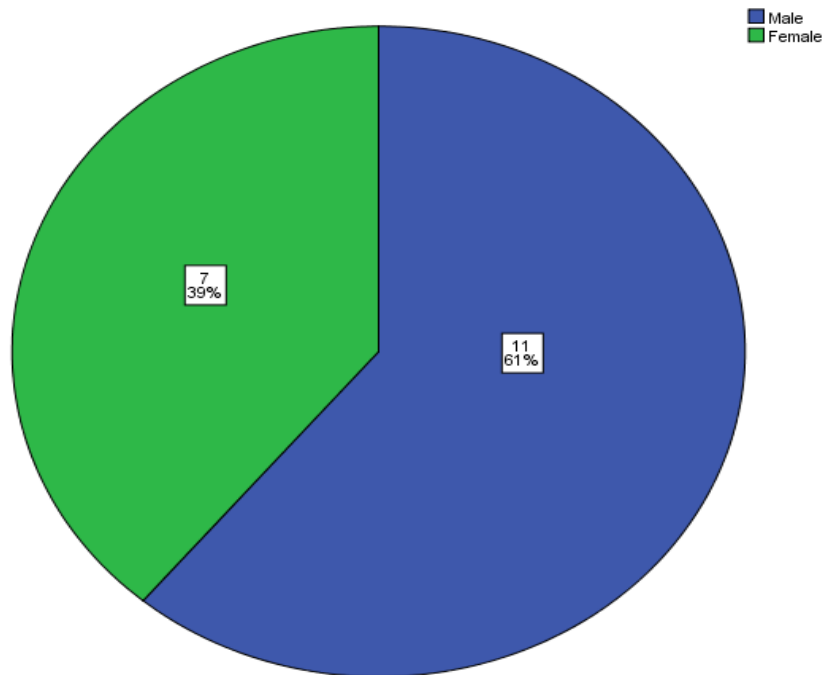
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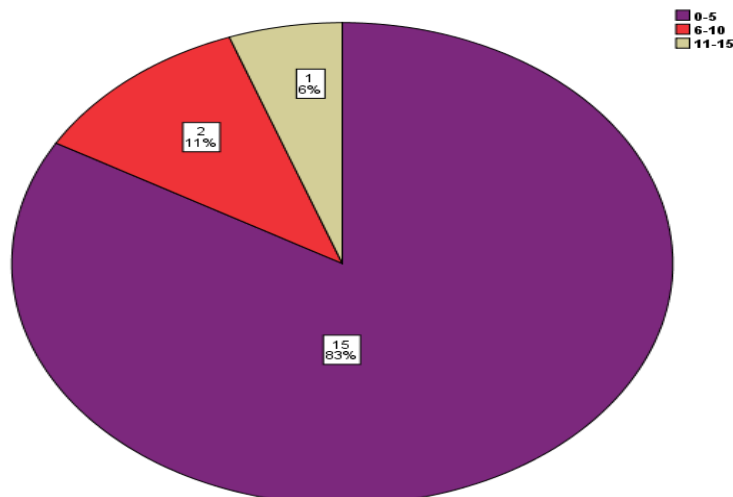
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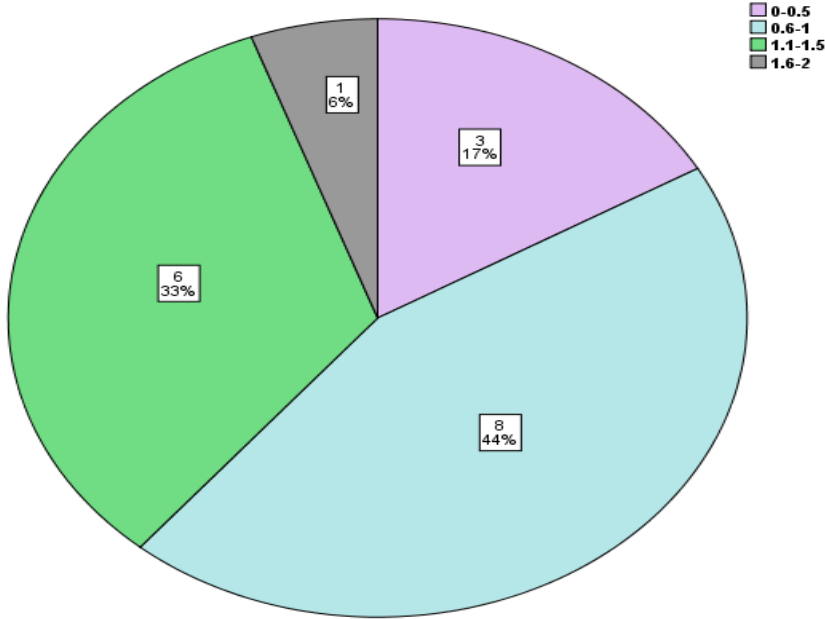
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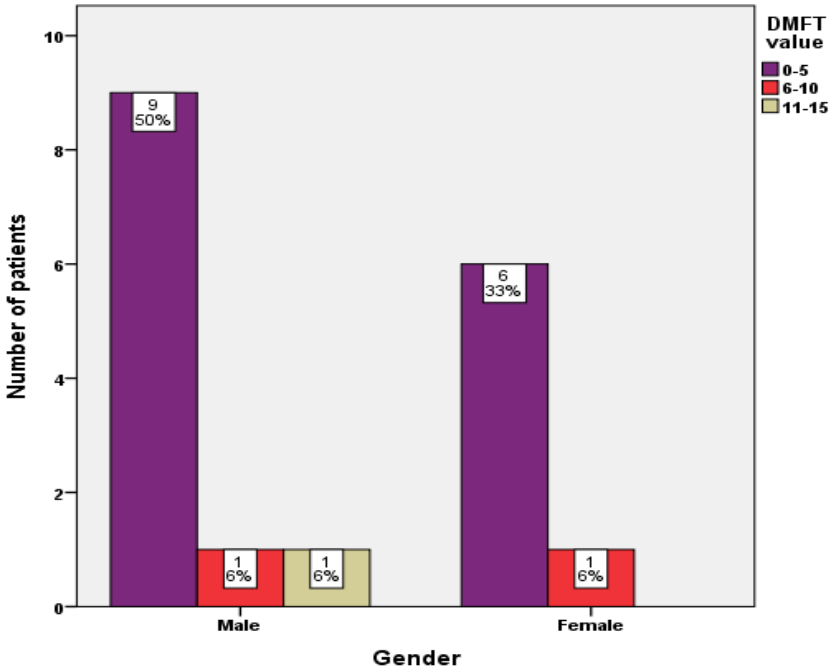
**Fig.1:** Pie chart shows the percentage of male and female patients with digit sucking habits. Blue colour represents the number of male patients (61%). Green colour represents the number of female patients (39%). It can be inferred from the chart that the number of male patients in the study were more compared to the number of female patients.



**Fig.2:** Pie chart shows the distribution of dmft values for the patients in the study. The values were divided into 3 groups. Purple colour represents the scores between 0-5 (83%), red represents the scores between 6-10 (11%) and beige represents the scores between 11-15 (6%). From the chart, we can infer that the majority of the patients had a DMFT score between 0-5. Only 1 patient was seen to have a DMFT score between 11-15.



**Fig.3:** Pie chart shows the distribution of OHIS values for the patients in the study. The OHIS scores were grouped into 4. Violet colour represents the scores between 0-0.5 (17%), light blue colour represents the scores between 0.6-1 (44%), light green colour represents the scores between 1.1-1.5 (33%) and grey colour represents the scores between 1.6-2 (6%). Majority of the patients had an OHIS score between 0.6-1 which indicates good oral hygiene. The least likely score was seen to be 1.6-2.



**Fig.4:** Bar graph represents the association between Gender and DMFT. X-axis represents the gender of the patients; Y-axis represents the number of patients in each category. Purple colour represents the scores between 0-5, red represents the scores between 6-10 and beige represents the scores between 11-15. Majority of male and female patients were diagnosed with a DMFT score between 0-5, hence the association was not statistically significant Chi-square test P value- 0.688 ( $p > 0.05$ )



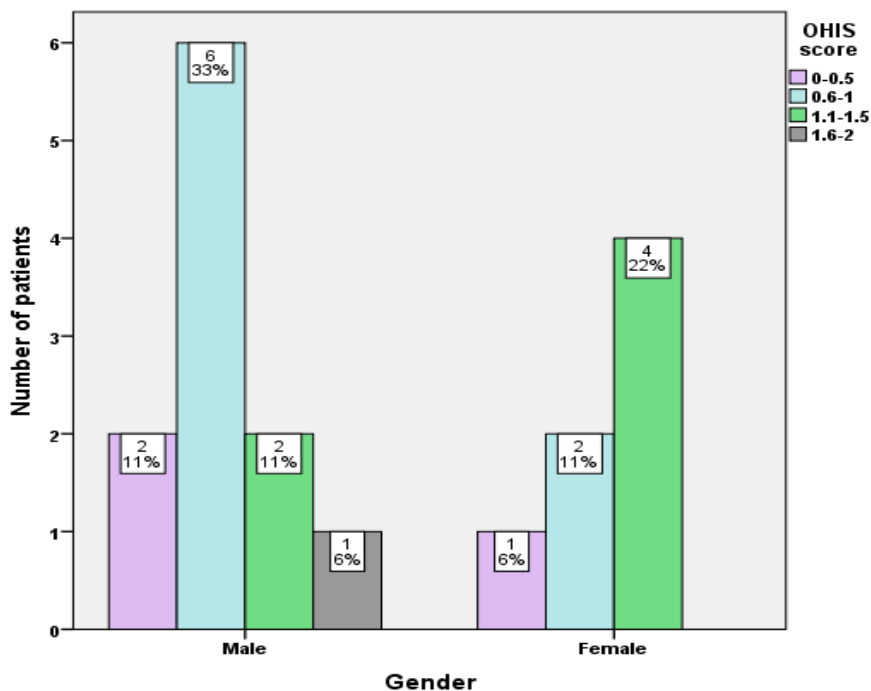


Fig.5: Bar graph represents the association gender and OHIS. X-axis represents the gender of the patients; Y-axis represents the number of patients in each category. Violet colour represents the scores between 0-0.5, light blue colour represents the scores between 0.6-1, light green colour represents the scores between 1.1-1.5 and grey colour represents the scores between 1.6-2. Male patients were seen to have higher OHIS scores as compared to female patients but not statistically significant P value- 0.351 ( $p > 0.05$ )

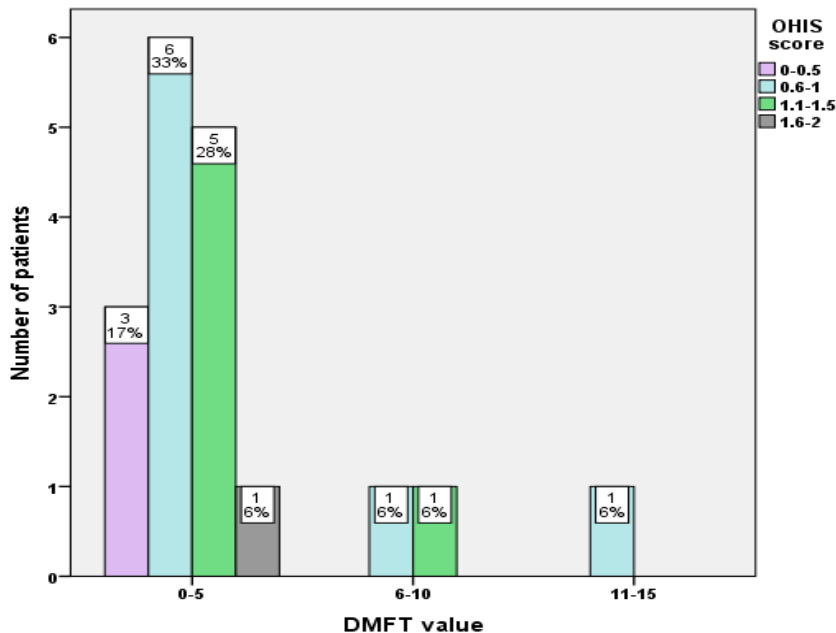


Fig.6: Bar graph represents the association between OHIS and DMFT scores. X-axis represents the DMFT scores; Y-axis represents the number of patients in each category. Violet colour represents the scores between 0-0.5, light blue colour represents the scores between 0.6-1, light green colour represents the scores between 1.1-1.5 and grey colour represents the scores between 1.6-2. It is seen from the graph that patients with low DMFT scores had relatively high OHIS scores. There was no significant association between the OHIS score and DMFT scores. P value- 0.913 ( $p > 0.05$ ) (Not significant)