

# PREVALENCE OF DENTAL CARIES AMONG PRE-CLINICAL YEAR AND CLINICAL YEAR STUDENTES AT PRINCE SULTAN MILITARY COLLEGE OF HEALTH SCIENCES, DHAHRAN, SAUDI ARABIA

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**Abstract:** Dental caries is one of the most prevalent diseases affecting human beings and persists till date as a challenge to the medical and dental profession, in particular, and the society in general.

**Objectives:** The aim of this study is to estimate the occurrence of dental caries at PSMCHS in Dhahran including the influence of socio-demographic factors.

**Method:** A cross sectional study was conducted at PSMCHS in Dhahran. A total of 266 male students aged 18 – 41 were randomly selected from pre-clinical and clinical students, by proportionate departments. The Data were collected according to the WHO criteria to diagnose dental caries. Finally , an analysis was done using IBM SPSS version 22.

**Results:** Out of a total of 266 student completing the questionnaire and the test, the occurrences of DMFT was 53.38% among the population, the occurrence of decayed teeth was 50%, missing teeth was 11.74% and filling teeth was 38.26%.

**Conclusion and recommendations:** In general, dental caries among students at PSMCHS were high; therefore, a major effort should be done to improve this condition. According to our findings, it should be focused on the prevention of DMFT.

**Keywords:** PSMCHS, Dental caries, WHO criteria.

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## 1. INTRODUCTION

A recent World Health Organization (WHO) report and other studies suggest dental caries to be a major public health problem in most of the developing countries.

Dental caries is one of the most prevalent diseases affecting human beings and persists till date as a challenge to the medical and dental profession in particular, and the society in general. Information on epidemiological figures of dental caries is a fundamental requirement, which updates our knowledge on changing trends of the disease and its treatment needs, and this helps in understanding ways and means to prevent its onset, and limit its progression and consequences. (WHO, 2006)

Pre-clinical and clinical year of Prince Sultan Military College of Health Science students have been universally accepted as global monitoring caries since all permanent teeth would most likely have erupted by this age.

Measuring dental caries prevalence among students is extremely important to establish baseline data, which are in order essential for oral health planners to apply intervention programs in PSMCHS.

The aim of this paper is to measure the distribution of dental caries among students at PSMCHS.

### **Statement of the problem**

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing.

The most common oral diseases are dental cavities, periodontal (gum) disease, oral cancer, oral infectious diseases, trauma from injuries, and hereditary lesions.

Dental caries (cavities) are the most common form of oral disease and the process of getting caries is called tooth decay. Tooth decay is the destruction of your tooth enamel –the hard, the outer layer of your teeth. This issue can affect children, teens, and adult. (MC, 2012)

Therefore, this study aims is to answer the following main question:

### **What is the prevalence of dental caries among Prince Sultan Military College of Health Sciences students?**

In regard to the main question, following are the questions related to it:

- a) What are the causes of dental caries among Prince Sultan Military College of Health Sciences students?
- b) What are the recommendations to minimize dental caries?

### **Study variables**

Variables included in the present study are:

- Dependent variable:
  - Prevalence of dental caries.
- Independent variables
  - Age
  - Marital status
  - Track
  - Preclinical/clinical students

### **Research hypothesis**

The research hypothesis includes the following:

1. There is no significant difference between dental caries prevalence among pre-clinical students and clinical students.
2. There is no significant difference between dental caries prevalence among Respiratory Therapy students and Emergency Medical Technology students.
3. There is no significant difference between dental caries prevalence among pre-clinical year and Clinical Laboratory Sciences students.
4. There is no significant difference between dental caries prevalence among pre-clinical students and anesthesia students.
5. There is no significant difference between oral habits among pre-clinical year students and clinical year students.
6. There is no significant difference between the prevalence of dental caries among older students and younger students.

### Research significance

This research is the first one that focuses on evaluation of the prevalence of dental caries among students attending PSMCHS during (Academic Year 2015-2016), and to get the knowledge about caries management and prevention. Also, this study will evaluate the students oral habits which will be beneficial in motivating students after they have an idea about the number of caries present.

### General objective

The purpose of this study is to determine the prevalence of dental caries among pre-clinical year and clinical year students at PSMCHS.

### Objectives

- 1- To estimate the occurrence of dental caries prevalence among pre-clinical year and clinical year students at PSMCHS.
- 2- Compare dental caries at PSMCHS with socio-demographic factors (students' track, age, marital status, and students' level)

### Research terminology

DMFT (Appendices 1) describes the amount - the prevalence - of dental caries in an individual. DMFT means to numerically express the caries prevalence and are obtained by calculating the number of: decayed (D), missing (M), and filled (F) teeth.

DECAY: Tooth decay, which is also called dental cavities or dental caries, is the destruction of the outer surface (enamel) of a tooth.

MISSING Teeth that have been extracted or congenitally un-erupted or fill down from trauma.

FILLING: A filling is a way to restore a tooth damaged by decay back to its normal function and shape.

PERIODONTITIS (Appendices2): Periodontitis is a common chronic inflammatory disease characterized by destruction of the supporting structures of the teeth (the periodontal ligament and alveolar bone).

## 2. LITERATURE REVIEW

### Prevalence and Correlates of Dental Caries in an Elderly Population in Northeast China

The aging population is a major challenge for social and economic development and sustainability worldwide. This is especially true in China, which owns about one fifth of the global aged population. Dental caries are a common disease among the elderly, which can result in pain and chewing difficulties, thus decreasing their overall health and quality of life. Epidemiological studies show that the prevalence of dental caries is lowest among children, adolescents, and middle-aged adults in countries where easy access to health care, preventive measures and medical insurance system are available. However, dental caries in the elderly population, with a prevalence rate from 49.3% to 78.6%, still remain a major concern. (PLoS One, 2013)

The study, above which is a portion of the third Chinese national oral health survey, represents the biggest survey ever conducted in northeast China, consisting of three provinces (Liaoning, Jilin, and Heilongjiang), which share similar historical background, geographic features, climate, dialect, and economic conditions.

The populations in these provinces have similar habits and customs and therefore can be seen as a homogenous group. The aim of this work was to investigate the prevalence and correlates of dental caries in the elderly population in northeast China.

In this study, we establish that the prevalence of dental caries was 67.5% in the elderly population in northeast China, and the DFT index was  $2.68 \pm 3.40$ . The observed prevalence is close to those noted in various previous surveys taken in Beijing. This showed that dental caries is still a common and frequently occurring disease, which did not improve alongside economic growth. Equally, a large geographic region in China, the northeast part of China, was one of the most advanced industrial bases in northeast Asia in the 1930s. Nevertheless, the economic growth in northeast China lagged behind south China, because of the reform and economic policies in those coastal areas. The descent in economic development in northeast China in turn slowed down the improvement of the people's lifestyle, culture, health consciousness, and behaviors, which might have touched on the behaviors of oral health among the elderly in northeast China and led to the increasing prevalence of dental caries.

In summation, the elderly population might experience more troubles in obtaining admission to dental care service compared with other age groups. There could be various factors beyond economic status contributing to it, including the geographical proximity of the dental clinic, difficulty in travelling (such as mobility, the need for assistance, fatigue, and medical conditions), and some management barriers in specialized institutions. Jointly, these factors could hinder the elderly population to gain dental care services and thus lead to a higher risk of developing dental caries. In this open field, potential factors that contribute to dental caries were not brushed up in this study such as salivary flow rate, use of dentures, and consumption of dairy products, which had been previously shown to contribute the incidence of dental caries. A big need for simple restorative treatment was observed in the studied population that can be characterized as routine clinical procedures, being the result of the existing problems consistent with the primary care level and with low prices. Reciprocally, the need for complex treatments of the endodontic type was small (13.4%).

#### **Dental caries in young male adults: prevalence, severity and associated factors**

(Braz., 2005), The aim of this particular study was to define the prevalence and severity of dental caries as well as the demands for dental treatment in 18-year-old males from Maringa, PR, Brazil. The connection of dental caries experience with socioeconomic variables was also examined. A cross sectional survey was conducted on a random sample of 241 conscripts of the Brazilian Army. The adopted diagnostic criteria were those nominated by the World Health Organization.

In spite of the fact that dental caries is the most studied oral disease in the macrocosm, the majority of studies concentrates in schoolchildren, with not enough research on the situation of the disease in young adults 15. Even though there are not sufficient data available regarding that population, including in industrialized, First World countries, and one can consider that an improvement is occurring in the levels of the disease in the last decades. It appears that this site is just manifesting itself in countries, which, already in the 70, presented a reduction in the caries experience of youngsters and teenagers. In any case, there are still researchers that are not sure whether these reductions are truly bringing real benefits to adult individuals or mean only a delay in the occurrence of carious lesions.

As concerns the group of Brazilian young adults, there are also no available data that may corroborate the occurrence of a decrease in the cryogenic attack. Close to local studies conducted in the last years in young and middle-age adults did not show any improvements when their answers were compared with the data presented by the 2002-2003 study sponsored by the Ministry of Health 5, in which young people of both sexes between 15 and 19 years were examined, and the findings were presented by region and not by town. Our investigation studied only 18-year-old males from a city in the Southern Region.

In 2002-2003, the mean DMF-T index for the 15-19 age group of the Southern Region was 5.8, as compared to the 4.6 index found in the present work. Still referring to the 2002-2003 study<sup>5</sup>, the filling component of the index for the same region was 3.3 (56.9%), revealing a substantial growth trend of the DMF-T index when compared to the 80.5% found in the present study.

A big need for simple restorative treatment was observed in the studied population that can be characterized as routine clinical procedures, being the result of the existing problems consistent with the primary care level and with low prices. Reciprocally, the need for complex treatments of the endodontic type was small (13.4%).

It can also be reasoned that the dental treatment needs of the studied population can be considered of easy resolution, through clinical-surgical procedures consistent with the primary care level.

Evaluation of the 18-year-old population is important to obtain a representation of the profile of oral diseases in young adults. This historic period is also a reference for the evaluation of oral health conditions at the international level, with a view to meeting the goals of the World Health Organization and the International Dental Federation.

#### **Caries prevalence in a 7 to 15-year old Albanian school children population**

Dental caries affects 60–90% of schoolchildren in most developing nations, and in several developing countries, the prevalence rates are increasing.

Many epidemiological studies on the prevalence of caries in different ethnic groups have been issued in the final years. They reported a prevalence of caries that varied in the different populations.

Epidemiological studies to monitor the changes in oral health status have not been conducted in Albania on a steady base or by specialized establishments. Reasons for higher oral disease prevalence are: increases in consumption of refined foods and fizzy drinks and a wide variety of sweets, underutilization of fluoride supplements or sealants, the lack of widespread and regular use of toothbrushes and fluoride toothpaste, the lack of dental health education and promotion, the privatization of the dental services and the resultant high prices and largely ineffective public dental services. Other causes for this post are the following: low fluoride level in drinking water (below 0.3 ppm), deficiency of financial resources for applying a caries prevention strategy all over the land and the absence of national caries and oral health prevention program.

The process of formulating a regional, national or local oral health strategy necessitates many stages. A preventive strategy must be programmed for the Albanese families including dental knowledge, routine care visits, the infectious nature of dental caries, awareness of dental benefits and access through Medicaid and awareness of dentists and dental clinics in the community. Furthermore, appropriate interventions could be developed to view and manage caries as a chronic disease.

The oral health status of children living in Tirana can be classified as quite poor: this situation indicates the need for preventive and restorative strategies. Adequate public dental health programs including school-based oral health education and primary oral care, increasing the number of dentists and oral hygienists, and decreasing the patient: dentist ratio can be recommended to the Albanian authorities.

In Albania, there is a need for dental education to improve behavior toward oral health and the current dental situation is not valid to reach WHO global goals for oral health 2020.

#### **Caries prevalence among schoolchildren in Zagreb, Croatia**

Dental caries are a public health problem that involves pre-school and high school children throughout the world, leading to pain, chewing difficulties, address problems, general health disorders, psychological problems, and lower quality of life (Coat., 12/2011). Information on caries prevalence and severity represents the basis for caries prevention programs and indicates the treatment necessity in the population.

The risk of caries significantly increases among adolescents with a high frequency of cryogenic snack consumption. It is likewise determined by maternal socioeconomic background and educational level, as well as dietary, hygienic, and other socioeconomic factors, which attests the importance of preventive educational programs and a comprehensive caries prevention scheme for schoolchildren. This work demonstrated the importance of epidemiological studies for caries prevention and maintenance of oral wellness. The share of children with single or more caries lesions were too high considering the currently available preventive possibilities.

The obtained DMFT and DMFS indexes, in comparison with other countries, illustrate poor oral health, low oral hygiene, and unsatisfactory prevention in Croatia, as comfortably as a need to invest in modern preventive and healing methods.

#### **Prevalence of dental caries among school children of Bharatpur city, India**

The prevention of dental caries has long been regarded as an important project for the health professionals. Scientists are keeping on their research in naming the best practices for diagnosis, treatment, and prevention of dental caries. Previous methods for the handling of dental caries in a surgical manner has been superseded by more novel strategies that emphasize disease prevention and conservation of tooth structure.

The scenario is different in developed countries where in recent years rapid changes have occurred in the prevalence of oral diseases. In the past decade, a significant decline in dental caries has occurred among children of various developed countries mainly USA and various European nations. Fluoride has been known as one of the most influential factors responsible for the observed decline of tooth decay among children as well as adults of these countries. (J Int Soc Prev. 2014)

Healthy teeth and oral tissues and the need for oral health care are important for any segment of society. Oral disorders can have a heavy impact on the quality-of-lifespan. Good oral health has real health gains, in that it can improve general wellness and quality-of-life and contribute to self-image and social interaction. Epidemiologic studies may be of value in assessing the prevalence of diseases, in discovering trends in disease development, and in analyzing possible factors influencing the disease pattern.

**Dental caries and tooth loss in adults in a Brazilian southeastern state, J. Appl. Oral Sci. vol.17 no.5 Bauru Sept./Oct. 2009**

In the first epidemiological survey on oral health conducted in Brazil, in 1986, poor oral health conditions were found for the population aged 35 to 44 years as well as for people living in the southeast portion of the country. The DMFT index (number of decayed, missing and filled teeth) for the southeastern region's population was 22.8, with an inverse association between tooth decay experience and income levels, and 41.6% of the adult population examined showed the demand for total prosthesis. In the state of São Paulo, the DMFT index was equal to 22.65. In the latest survey conducted in 1998 in the province of Sao Paulo, DMFT index equal to 22.4 was obtained, virtually unchanged after 12 years from the 1986 survey. Although the values are similar, the comparability of the ingredients of the DMFT index indicated a decrease in the proportion of lost teeth, and revealed that in municipalities with fluoridated water, this component proved to be slightly lower<sup>16</sup>. Despite this advance, the oral health condition among adults still remained very unsatisfactory.

Thinking that the biggest part of the Brazilian population is composed of economically active adults<sup>11</sup>, the cognition of the oral conditions in this group is considered relevant, seeking to conduct health and dental treatment actions, assuring equity in the forethought of the needs of this population<sup>10</sup> and preventing tooth loss in this group.

**Prevalence of Total Tooth Loss, Dental Caries, and Periodontal Disease in Mexican-American Adults: Results from the South-western HHANES**

The prevalence of total tooth loss in Mexican-Americans was significantly lower than that of residents of the Western States in 1971-1974, and is even more downcast than the national close to 8.7% found in largely non-Hispanic Americans who participated in the 1983 National Health Interview Survey (Ismail Et al., 1987b). This low rate of total tooth loss in Mexican- Americans in the five Southwestern states might be an underestimate, an artifact of the sampling design. The Southwestern HHANES was carried out mostly in large urban communities in five Southwestern states, resulting in a sampling bias which may have excluded people in rural areas who may have higher degrees of total tooth loss. Valuable information on periodontal disease in Mexican- Americans have come from two recent studies (Ismail et al. 1986 and 1987c), but similar analysis of the periodontal data. For this work cannot be carried out because of the limitations of the PI index.

The PI was developed 30 years ago as an the index for epidemiological studies, and was extensively validated against clinical diagnoses at that time.

The clinical perceptions of periodontal disease at the time of the PI's evolution, however, is today considered highly questionable. (Polson and Goodson, 1985)

**Prevalence of dental caries and treatment needs among children of Cuttack (Orissa).**

Dental Caries is the result of a multiple complex. The process involves factors like diet, microorganisms, trace elements, saliva, genetic predisposition and tooth morphology. Apart from these, many related factors like individual, social, environmental and cultural factors are also responsible.

In recent years, the worldwide distribution of dental caries. Present a varied image, most of the states with low. Caries prevalence is going through an unprecedented. Increase in caries prevalence and severity of dental caries.

Including India. I, on the other hand, have several industrialized countries a reduction of dental caries incidence and improvement of gingival health care are evident<sup>1,2</sup>.

This decline in dental caries was mainly due to appropriate use of fluorides and preventive oral health measures<sup>3,4</sup>. The scenario in India is no different from other developing countries.

Available literature of 1940 to 1960, the prevalence of dental caries in India showed a varied. Picture i.e., caries being very high in some areas and low in some areas<sup>5,6,7,8</sup>. In spite of conflicting reports it has been observed that during 1940 the prevalence of dental caries in India was 55.5%, during 1960 it was reported to be 68%<sup>4</sup>.

Further it has been observed that dental caries was always higher in highly urban and cosmopolitan places<sup>7</sup>.

The dental caries experience in an individual in both permanent dentition is directly related to oral micro flora established with completion of primary dentition. Studies revealed the fact that if caries was not allowed to progress and involved tooth surfaces in late primary dentition, it was not likely to do so in mixed dentition period<sup>9</sup>.



Proper application of preventive methods can reduce incidence of dental caries. This can be possible from the experience derived from the countries where the disease is in decline and it is the right time to get basic information about the disease pattern all over the country, its exact nature, degree of severity and to understand its association with specific factors. The aim of the study was to assess caries experience on child population of 5, 8, 11 & 15 years old children of Cuttack, Orissa.

A city with its own peculiarity of having both urban and rural population. To determine the status of dental caries of Children using WHO criteria 10. To evaluate curative and preventive need to fight dental caries.

### **Prevalence of dental caries among 12–14 year old children in Qatar**

In Qatar, the oral health care system is in transitional and developmental stages. Systematic data collection is vital to evaluate and plan oral health care for the public. The WHO Global Oral Data Bank (WHO, Oral Health Country/Area Profile, 2013) has collected data on caries prevalence in many countries.

Unfortunately, to date, the dental caries status among the school children population in the state of Qatar has never been documented. The absence of dental caries prevalence data in Qatar prevents the organization of any community- oriented oral health promotion programs; therefore a systematic analysis of the dental caries status of Qatar was required. Based on these conditions, the results of the current study are novel, as no similar studies have previously been conducted among Qatar school children. Therefore, the objectives of the study were as follows:

- Measure dental caries prevalence among 12–14 year old school children in Qatar.
- Compare dental caries in Qatar by socio-demographic factors (gender, ethnicity, age, residence, and school type).
- Compare dental caries results from Qatar with comparable findings from Eastern Mediterranean regions and other parts of the world.

### **Dental Caries and Growth in School-Age Children**

Findings reveal an inverse linear association between caries levels and children's height and weight. The findings take the argument beyond the presence or absence of an association and provide a better understanding of the pattern of this association.

There is increased interest in the relationship between caries and growth in young children and mechanisms whereby caries may affect growth. Evidence linking caries in primary teeth and children's anthropometric outcomes in cross-sectional studies is contradictory in terms of both the presence and the direction of the association. Some studies report a relationship between caries and poor growth. Two theories may explain this relationship. The first theory is that the direct impact of extensive untreated caries and associated pain and inflammation on the child's ability to eat may result in under-nutrition and growth impairment. The second theory includes the indirect effects of untreated caries and different body responses to chronic dental infection.

Three mechanisms are suggested. The first concerns immune responses. Infected dental pulp may affect immunity and erythropoiesis, which may result in anemia and influence bone remodeling, sleep patterns, and food intake. This mechanism is supported by results of a randomized controlled trial showing that treatment of severe caries in children aged 6 to 7 years significantly improved their appetite. The second mechanism is related to endocrine responses. The interruption of slow-wave sleep due to pain and infection may lead to impairment of growth hormone secretion. The third mechanism is linked to metabolic responses. Infections and related inflammation might result in micronutrient under-nutrition through increasing energy expenditure and metabolic demands and impaired nutrient absorption. In contrast to the studies reporting a relationship between caries and poor growth, some studies did not find any relationship between anthropometric outcomes and caries.

## **3. METHODOLOGY**

### **Research methodology**

The cluster random sampling technique was used to select the samples from students at the college.

### **Study design and setting**

The research was conducted at the Prince Sultan Military College of Health sciences (dental and oral health department), Dhahran.

**Sampling design**

In this research 266 samples were collected from preclinical and clinical students at PSMCHS.

**Data collection tool**

Two researchers examined the students and two recorded the data by using dental records. They would alternate the placement. A disposable set was used including a mouth mirror, an explorer, an illumination light, and a 3 in 1 syringe. A red pen was utilized to indicate decay teeth, and a blue pen was utilized to indicate filled and missing teeth.

**Pilot study**

In 17/11/2015 we started our pre- test for our research, PREVALENCE OF DENTAL CARIES AMONG PRE-CLINICAL YEAR STUDENS AND CLINICAL YEAR AT PRINCE SULTAN MILITARY COLLEGE OF HEALTH SCIENCES, DHAHRAN, SAUDI ARABIA.

We started with 8 pre- clinical students and 8 clinical students. We recorded complete information about the student's name, age, gender and specialty, and also included the medical and dental history of the students. Then we let the patients sign a consent form. After that, we start to check and fill in the dental chart by checking the DMF (DECAY, MISSING, FILLING)

**Table 1: Result of the Pilot Study**

Specialty	Decay	Missing	Filling
Pre-clinical	48	19	30
Clinical	15	21	13

**Table 2: Procedure and time frame**

MONTH	SEPTEMBER				DECEMBER				JANUARY				FEBRUARY				MARCH				APRIL			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
PROPOSAL PREPARATION																								
COLLECTION OF DATA																								
DATA ENTRY																								
ANALYSIS DATA																								
RESEARCH PAPER WRITING																								

**Data analysis**

The data were entered into the Microsoft Excel after the collection. All the variables in the questionnaire were entered, and their responses were coded for easy analysis. All variables were examined and cleaned to find the missing values if any.

The collected and presented data were analyzed by using the following method:

- The distribution of the all-quantitative values of variables was examined with descriptive statistics (Mean, and Standard deviation).
- Frequency tables for other demographic variables among samples.
- All statistical tests will be two-sided.
- A P value of  $\leq 0.05$  will be considered statistically significant.
- The IBM SPSS (Statistical Package for Social Sciences) version 22 was used for statistical analysis.

**Ethical considerations:**

Administrative approval was taken from Prince Sultan Military College of Health Sciences in Dhahran to conduct the study.



The research introduction was explained the purpose of the study and that all collected data from the students will be used for research purposes only and will be dealt with confidentiality.

### Validity and reliability test

The demography utilized in this research is already employed in the dental department at PSMCHS, and the index (DMFT) is also know in World Health Organization (WHO).

### Limitation

For students' time possibly be hampered us in many cases, the fact that the date specified day and the short period. Full attendance of students possible, at least the required sample. From the other hand, we need permission to book the clinic and determine the time for each sample. Possible that the participant sample would be unwilling to allow that complete examination. Furthermore, that clinic's capacity is limited in providing testing tools, possible requests sample compared to participate treatment not exist.

## 4. RESULTS

Out of a total of 266 male students that completed the questionnaire and test 213 (80.1%) had decay, 50 (18.8%) had missing teeth and 163 (61.28%).

**Table 3: Socio-demographic characteristics of the students with DT, MT, FT prevalence's**

<b>College students (n=266)</b>				
<b>Characteristics</b>	<b>n(%)</b>	<b>DT (n,%)</b> 213 (80.75)	<b>MT (n, %)</b> 50 ( 18.80)	<b>FT (n, %)</b> 163 (61.28)
<b>Student track</b>				
Diploma	35 (13.2)	30 (14.08)	8 (16)	26 (15.95)
Bachelor	231 (86.8)	183 (85.92)	42 (84)	137 (84.05)
<b>Age (year)</b>				
18-21	184 (69.2)	150 (70.42)	37 (74)	114 (69.94)
22-25	65 (24.4)	51 (23.94)	9 (18)	39 (23.93)
26-29	9 (3.4)	8 (3.76)	1 (2)	5 (3.7)
More than 29	8 (3.0)	4 (1.88)	3 (6)	5 (3.7)
<b>Marital status</b>				
Single	253 (95.1)	203 (95.31)	46 (92)	155 (95.09)
Married	13 (4.9)	10 (4.69)	4 (8)	8 (4.91)
<b>Students level</b>				
Pre-clinical	94 (35.5)	73 (34.27)	16 (32)	60 (36.81)
BMT	35 (13.2)	24(11.27)	5 (10)	16 (9.82)
EMT	29 (10.9)	32 (15.02)	7 (14)	18 (11.04)
CLS	39 (14.7)	21 (9.86)	9 (18)	20 (12.27)
ANES	28 (10.5)	29 (13.62)	2 (4)	20 (12.27)
HSA	4 (1.5)	30 (14.08)	8 (16)	26 (15.95)
RES	37 (13.2)	4 (1.88)	3 (6)	3 (1.84)

Table 3 shows the characteristics of the studied samples. Diploma students constituted 35 (13.2%) of the sample, while bachelors students were 231 (86.8%). Among all the students 30 (14.08%) diploma students, and 183 (16%) bachelors students had decayed teeth. From the 50 students who had missing teeth 8 (16%) were diploma students and 42 (84%) were bachelor is students. The majority of the 163 students (80.04%) who had filling bachelor students.

Table (3) shows that 70.42%, 23.94%, 3.76%, and 1.88% DT, MT 74%, 18%, 2%, and 6%, while FT 69.94%, 23.93%, 3.7% and 3.7% for 18 -21, 22-25, 26-29 and above 29 years respectively.

Also table (3) shows that single students constituted 253 (95.1%) of the sample, while married students were 13 (4.9%). From the 213 DT, 203 (95.31%) single students had decayed teeth. From the 50 students who had missing teeth 46 (92%) were single students and the majority of the 163 students 155 (95.09%) were bachelor students with filling teeth.

**Figure 1: Occurrence of dental caries among students at PSMCHS in Dhahran**

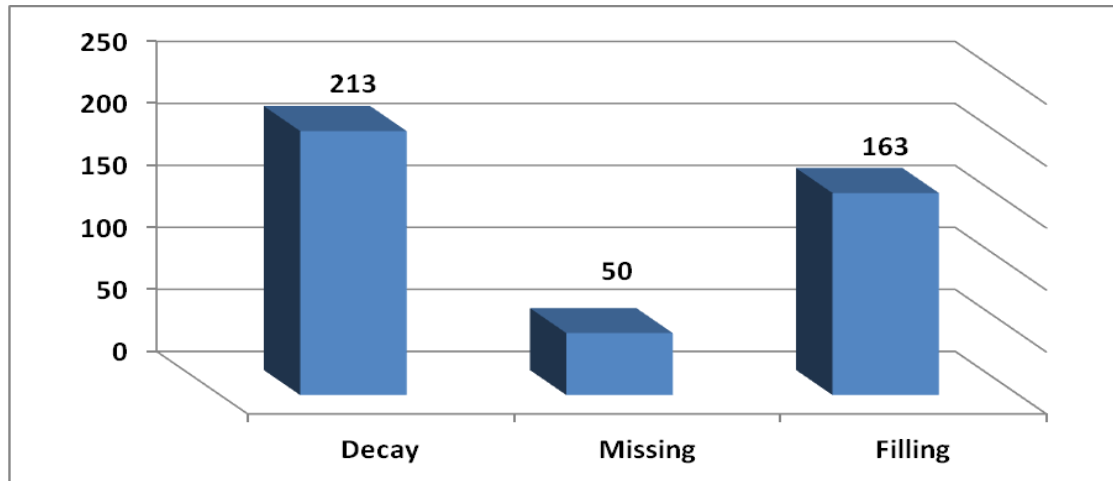


Figure 1 above shows the occurrence of dental caries. The overall occurrence of decayed teeth at PSMCHS was 80.75 %, 18.80% was missing and the fillings were 61.28%.

**Figure 2: Occurrence of dental caries among departments at PSMCHS in Dhahran**

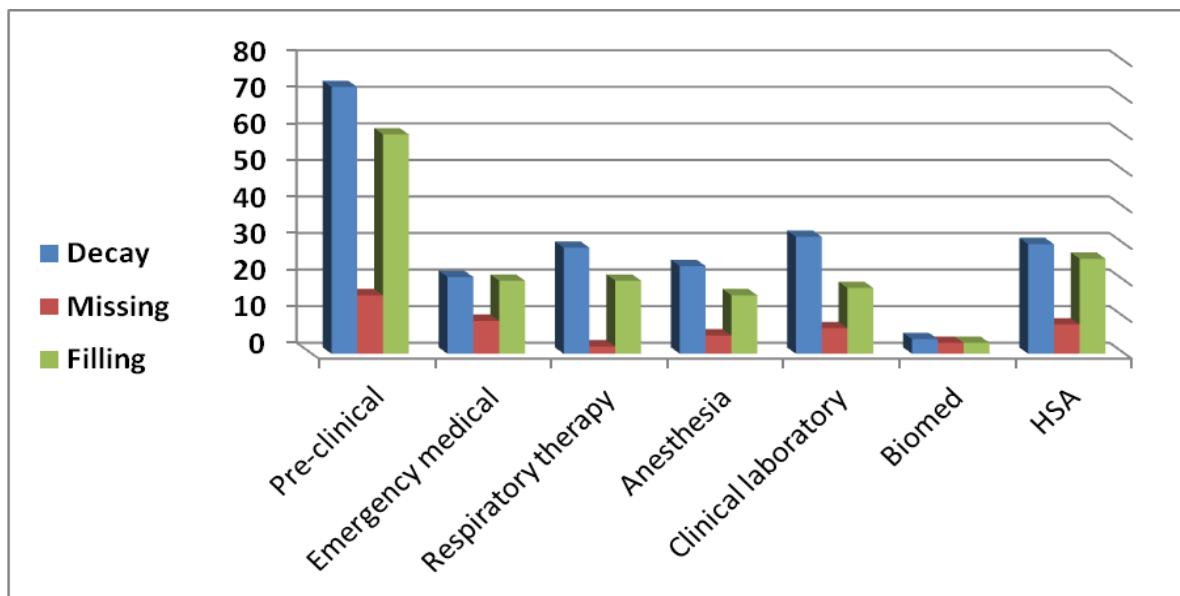


Figure 2 above shows the occurrence of dental caries among different departments at PSMCHS. The occurrence of decayed teeth was at all departments the most common was dental caries, followed by filling and the last was missing.

**Table 4: General health questions**

Q1	General questions	Student (n=266)	
		Number (Yes)	%
Q1.1	Are you treated by a doctor at the moment?	2	0.8
Q1.2	Have you been hospitalized, had surgery under general anaesthesia?	2	0.8
Q1.3	Have you had problems and /or treatment for the following? (Heart, Lungs, Liver, ...) heart= 2, Anaemia= 3, diabetes= 2	7	2.6
Q1.5	Have you had any reactions or allergies to any medication?	0	0
Q1.6	Do you have any prosthetic implants?	2	0.8

With regard to the general questions as illustrated by table 4 above, only 0.8% of the students were currently treated by a doctor at the moment, 0.8% have been hospitalized and had surgery under general anaesthesia, 2.6% of the students had problems or treatment with heart, anemia and diabetes, 100% did not have any reactions or allergies to any medications, while 0.8% had prosthetic implants.

**Table 5: General Oral Health Questions**

		Students (n=266)	
Q2	General oral health question	Number (Yes)	%
Q2.1	Is this your first visit to a dental clinic?	0	0
Q2.2	Can you remember when you had your last dental appointment?	0	0
Q2.3	Did you experience any problems during and after your previous dental treatment(s)?	0	0
Q2.4	Have you had any of the following, past or present?		
Q2.4.1	Head injuries	1	0.4
Q2.4.2	Pain or sounds in the jaw joints	0	0
Q2.4.3	Pain when biting	0	0
Q2.4.4	Grinding the teeth when sleeping	0	0
Q2.4.5	Do you use tobacco in any form, and habitually?	96	36.1
Q2.4.7	Would you like to be able to stop this habit of tobacco use?	266	100

It was noticed that all of the participating students are not visiting dental clinic regularly. In fact, they cannot remember their last dental appointments. Also, all of them were experiencing problems during and after their previous dental treatment(s). In addition, 100% of the students didn't have pain or sounds in the jaw joints, pain when biting, and grinding the teeth when sleeping, while 0.4% of the students had head injuries, and 36.1% use tobacco in any form and habitually, 100% liked to be able to stop this habit of tobacco use.

**Table 6: Oral Health and Oral Hygiene Consideration**

Students (n=266)			
Q3	Oral Health and Oral Hygiene Consideration		
Q3.1	Which word would you see to describe the mouth and teeth?	No.	%
		Bad	56 21.1
		Average	189 71.1
		Good	21 7.9
		No.	%
Q3.3	Do you use any kind of tooth cleaning aid(s) ?	262	98.5
Q3.5	Would you be interested in more information on how to make sure that the mouth and teeth are in the best condition all the time?	266	100

Regarding oral health and oral hygiene consideration (table 6), above illustrates that the majority (71.1%) of the students had average mouth and teeth condition, (98.5%) use any kind of tooth cleaning aid(s), while 100% were interested in more information on how to make sure that the mouth and teeth are in the best condition all the time.

Figure 3: Description of mouth and teeth condition

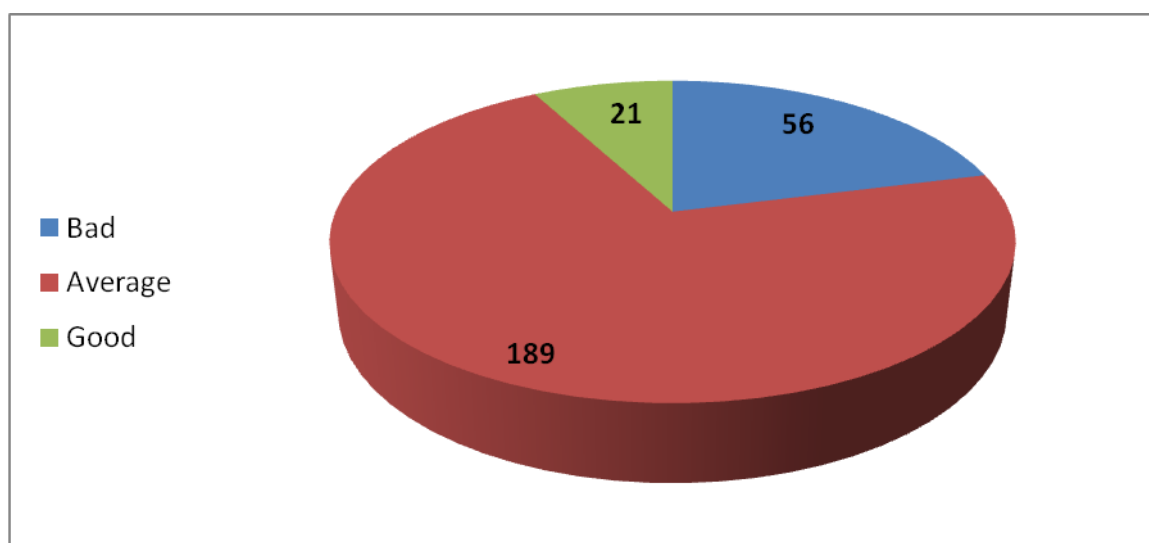


Table 7: Mean caries indices by socio-demographic and other characteristics among student in PSMCHS (n=266)

	DT (213) Mean (SD)	p-value	MT (50) Mean (SD)	p-value	FT (163) Mean (SD)	p-value	DMFT Mean (SD)	p-value
<b>Age group (in years) ***</b>								
18 – 21	4.07 (2.4)	0.028	1.84 (1.1)	0.671	3.68 (3.3)	0.085	2.94 (0.9)	0.432
22 – 25	4.82 (2.9)		2.11 (1.2)		3.31 (2.4)		3.6 (1.5)	
26 – 29	6.25 (3.7)		1.00 (0.0)		1.80 (0.8)		3.33 (-)	
29 and above	2.75 (1.0)		2.33 (1.2)		6.60 (4.3)		2.00 (-)	
<b>Clinical-Preclinical ***</b>								
Preclinical	3.97 (2.7)	0.601	1.75 (1.1)	0.084	3.85 (3.6)	0.495	2.48 (1.0)	0.252
ANES	4.92 (2.9)		2.20 (1.3)		3.25 (2.7)		3.33 (0.0)	
CLS	3.97 (2.0)		1.71 (1.1)		3.06 (2.0)		2.83 (0.2)	
EMT	4.29 (1.9)		1.78 (1.0)		3.50 (2.9)		3.00 (0.7)	
RES	4.86 (3.1)		1.00 (0.0)		4.70 (4.0)		2.33 (0.0)	
BMT	4.37 (3.1)		2.88 (0.8)		2.85 (2.0)		3.93 (1.2)	
HSA	5.00 (2.6)		1.0 (0.0)		4.67 (4.7)		3.4 (1.5)	
<b>Marital Status **</b>								
Single	4.34 (2.7)	0.386	1.87 (1.1)	0.510	3.60 (3.1)	0.727	3.00 (1.0)	0.601
Married	3.60 (1.3)		2.25 (1.5)		4.00 (3.7)		3.33 (1.5)	
<b>Track **</b>								
Diploma	4.37 (3.1)	0.890	2.88 (0.8)	0.005	2.85 (2.0)	0.172	3.9 (1.2)	0.026
Bachelor	4.30 (2.5)		1.71 (1.0)		3.77 (3.2)		2.84 (0.9)	

DT – Decayed teeth, MT – Missing teeth, FT – Filled teeth, DMFT – Decayed, missing and filled teeth

\*\* By student's t-test

\*\*\* By One way ANOVA test

The mean DMFT value for Preclinical, ANES, CLS, EMT, RES, BMT, and HSA was respectively 2.48 ( $\pm 1.0$ ), 3.33 ( $\pm 0.0$ ), 2.83 ( $\pm 0.2$ ), 3.00 ( $\pm 0.7$ ), 2.33 ( $\pm 0.0$ ), 3.93 ( $\pm 1.2$ ) and 3.4 ( $\pm 1.5$ ), (table 5), above shows that the dental caries increased with BMT students, followed by HSA students, and were less with the students from RES and preclinical.

DMFT analysis showed mean DT values were 3.97 ( $\pm 2.7$ ), 4.92 ( $\pm 2.9$ ), 3.97 ( $\pm 2.0$ ), 4.29 ( $\pm 1.9$ ), 4.86 ( $\pm 3.1$ ), 4.37 ( $\pm 3.1$ ), and 5.00 ( $\pm 2.6$ ) respectively for Preclinical, ANES, CLS, EMT, RES, BMT, and HSA. The mean MT values were 1.75 ( $\pm 1.1$ ), 2.20 ( $\pm 1.3$ ), 1.71 ( $\pm 1.1$ ), 1.78 ( $\pm 1.0$ ), 1.00 ( $\pm 0.0$ ), 2.88 ( $\pm 0.8$ ), and 1.0 ( $\pm 0.0$ ) respectively for Preclinical, ANES, CLS, EMT, RES, BMT, and HSA. The mean FT values were 2.48 ( $\pm 1.0$ ), 3.33 ( $\pm 0.0$ ), 2.83 ( $\pm 0.2$ ), 3.00 ( $\pm 0.7$ ), 2.33 ( $\pm 0.0$ ), 3.93 ( $\pm 1.2$ ) and 3.4 ( $\pm 1.5$ ), respectively for Preclinical, ANES, CLS, EMT, RES, BMT, and HSA. The DT component was the major constituent of DMFT index.

Moreover, the diploma students exhibited a higher mean DMFT value 3.9 ( $\pm 1.2$ ), than bachelor students 2.84 ( $\pm 0.9$ ). Also, Single students showed a lower mean DMFT value 3.00 ( $\pm 1.0$ ) than married students 3.33 ( $\pm 1.5$ ).

Table 7 above shows that DMFT was significantly more common among diploma students with mean (3.9) as opposed to bachelor students with a mean (2.84) ( $P = 0.026$ ).

## **5. DISCUSSION**

The occurrence of DMFT in our study was 53.38%, DT were the most common dental caries in our study population. It represented 50% of the total dental caries, followed by FT (38.26%) and last MT (11.74%).

Many risk factors associated with dental caries were identified in previous studies in the related literature. In our study, we found no significant association between DMFT and the age of the student, the department of students or the marital status of the student. There is significant association between DT related to the age of student, the group age 26 -29 has higher incidence of decay teeth.

The occurrence of dental caries in the current study was found to be significantly lower in the bachelor programs than students in the diploma programs.

Finally, DT was found to be the most common of dental caries in the current study.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusion**

The following findings include a summary of the important points of this study:

1. The overall dental caries prevalence among students at PSMCHS in Dhahran was 53.38%. The Mean DMFT values were respectively 2.48 ( $\pm 1.0$ ), 3.33 ( $\pm 0.0$ ), 2.83 ( $\pm 0.2$ ), 3.00 ( $\pm 0.7$ ), 2.33 ( $\pm 0.0$ ), 3.93 ( $\pm 1.2$ ) and 3.4 ( $\pm 1.5$ ), for Preclinical1, ANES, CLS, EMT, RES, BMT, and HSA.
2. DT was found to be the most common of dental caries in the current study, followed by FT.
3. Dental caries were affected by socio-demographic factors, but significant differences were observed only for the track of the students, where it was more in the diploma students than the bachelor students.

### **Recommendations**

1. Dental caries consultation should be offered to the students by their doctors. Awareness and advice should be targeting different student's age groups to teaching them about the most common dental caries and how to prevent them.
2. National awareness should be raised toward dental caries by educating the people about dental hygiene safety and dental caries prevention. Finally,
3. Education is an important tool that should involve all people.

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