Deanship of Graduate Studies
Al- Quds University

"Periodontal Diseases Among 15- Years Old School Students in Nablus City"

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Master Thesis

Jerusalem- Palestine

2011/1432

"Periodontal Diseases Among 15- Years Old School Students in Nablus City"

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A thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Health/School of Public Health , Al-Quds University, Jerusalem, Palestine.

Jerusalem- Palestine
2011/1432

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Thesis Approval

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Dedication

MY FATHER

    For uncompromising principles that have guided his life

MY MOTHER

    For leading her children into intellectual pursuits

MY HUSBAND

    For leading his magnificent devotion for his family

MY BROTHER AND SISTERS

    For making everything worthwhile

Sura Ibrahiem Kazlak

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الإقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان :

</div>

"Periodontal Diseases Among 15- Years Old School Students in Nablus City"

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"مدى انتشار أمراض دواعم الأسنان بين طلاب المدارس الذين أعمارهم 15 سنه في مدينه نابلس"

أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه كمرجع حيثما ورد، وأن هذه الرسالة ككل، أو جزء منها لم يقبل لنيل أي درجة أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى .

</div>

Declaration

The work provided in this thesis, unless otherwise referenced , is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name :	**اسم الطالب :**
Signature :	**التوقيع :**
Date:	**التاريخ:**

Acknowledgement

First and foremost I offer my sincerest gratitude to my supervisor, Dr.Ziad Abdeen, who has supported me throughout my thesis with his patience and knowledge. I attribute the level of my Masters degree to his encouragement and effort. It is deep pleasure to express many sincere thanks to the Faculty of Public Health, University of Al-Quds and all it staff especially those who taught me.

I am grateful to all schools' administrators in the Nablus city for their friendly assistant and help during collecting the data for this study.

My warmest grateful from the deep of my heart goes to my family, many thanks to my father which without his help and support this thesis would not have been completed or written, my mother, sisters, brother and all my friends.

Finally, I offer my deepest gratitude to my husband Dr.Mazen for his caring, inspiring and supporting me throughout my study.

ABSTRACT:

The present research study is a potential effort that was carried out to assess the prevalence and severity of the periodontal diseases in the 15-years old school students in Nablus city.

Nine school students were randomly chosen in Nablus city-Palestine for this study. The adopted numbers of the participant students were 424 who were randomly selected from both sexes aged 15 –years old. The students were interviewed separately and the pre-prepared questionnaire was filled with the free well of each students.

The described criteria of WHO (2005) was followed by the researcher for an accurate and thorough sampling and clinical diagnosis of the periodontal diseases. Two indicators ,the gingival bleeding and calculus of oral diseases were examined in each student.

The obtained results showed that (26.2%) of the participant students were having health gingival,(41%) of them were having gingival bleeding (=score 1 of CPITN) ,(32.8 %) of them were having supra- gingival calculus(=score 2 of CPITN).

The obtained results of SOHI measurements showed that (92.5%) of the participant students were having bad oral hygiene status. The correlation between SOHI and CPITN shows a significant statistical relationships with p-value= 0.000.

In this study it is found that there was a significant statistical relationship between the working status of the students' mothers and the CPITN scores with P- value =0.039 in the 15 years old students.

The obtained results showed that there was a significant statistical relationship between the frequency of meats eating per week and the gingival status with p-value=0.006 in the 15-years old in Nablus city. But there were no statistical relationships between the other types of the consumed diets and the gingival status.

The obtained results showed that the majority ratio (85.8%) of the participant students did not use to smoke, thus the smoking habits indicated no effects on the gingival status of the participant students.

The results also showed that no significant statistical relationships between the educational levels of the students' parents and the CPITN with P-value= 0.593, 0.497.

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List of Abbreviations

AAP	American Academy of Periodontology
ADA	American Dental Association
BOP	Bleeding On Probing
CPITN	Community Periodontal for Treatment Needs
CROP	Recherche Marketing Sondages d'opinion
FAO	Food and Agriculture Organization
GI	Gingival Index
Max.	Maximum
MOH	Ministry of Health
OR	Odds Ratio
OHI	Oral Hygiene Instructions
PCBS	Palestinian Central Bureau of Statistics
SES	Socio-Economic Status
SOHI	Simplified Oral Hygiene Index
SPSS	Statistical Package for Social Scientists
WHO	World Health Organization
Vit.	Vitamin

CHAPTER ONE

1.1 Introduction

Oral health is an integral part and a vital component of overall health (Mitsea, et al, 2001). Oral cavity plays a vital role in the life of human beings, through multiple functions like mastication, esthetics, phonetics and emotional expressions. It is highly essential to safeguard oral health of all population starting from the childhood period. Poor oral health may lead to various dental diseases like dental caries and periodontal diseases which adversely affects the overall health (Al-kazragi,2001; Shivakumar, 2002). A holistic view of the components of a population's oral health is necessary to achieve comprehensive understanding of oral health needs. The dental services required to match the oral health needs both locally and nationwide. Application of a comprehensive approach to oral health assessments may lead to more cost-effective oral health services provision (Asadi-Lari, et al, 2004; WHO 2008a). In the evaluation of oral health programes, measurements of health and diseases should be considered in addition to intermediate outcomes (which may be risk factors) (Petersen & Kwan, 2004). In recent years efforts have been made to recognize oral health as an integral part of overall health (Peterson, 2003). Moreover, the oral cavity has a multitude of functions in relation to daily life such as food intake, speech, social contact and appearance. Poor oral health has the potential effects that may hampering the quality of life. Oral pain or poor dental status can cause decrease in food intake, worsen the nutritional status and that may resulted in low growth of the children (Sheham, 2006). Pain might also have a negative impact on the ability to engage in social relations and children might not get the full benefit of their education. While poor dental status among children has a negative effects on speech and development, it may also have a

socially stigmatizing effects in the adolescents (Jiang, et al, 2005; Jürgensen, et al, 2009).

Dental caries and periodontal diseases, as the most common oral diseases, have considered as major public health problems and have burdened the majority of population with heavy treatment needs (Peterson, et al, 2005; WHO, 2005). Historically WHO (1978) have reported that periodontal diseases are from the most widespread chronic diseases in the world also has been considered as the most important global oral health burdens. They cause pain and economic loss through many aspects which including the sick leave for the officials and workers. Another aspect of economic loss can be shown through the costly dental equipments, materials and services (Al-kazragi, 2001). These Periodontal diseases are more prevalent in developing countries, particularly in rural areas, and has been reported to appear at an early age in developing countries (as with gingivitis) and progress with age to periodontitis (Manji, et al, 1988; Rahimah , 1994 ; Khamarco, et al, 1997) .

 The trends of periodontal diseases have rapid and high changes in all ages all over the world (Jain, et al, 2009), but may affects adolescents and young adults in varying degrees worldwide (Källestål ,et al ,1990; Sood, et al ,2010). Periodontal diseases, at their end stage result in teeth loss and edentulouness (Hessari, 2009). Teeth loss is found in 5–20% of most adult populations worldwide, thus, vast majority of countries need to establish a surveillance system for measuring the progress in the control of periodontal diseases and promotion of oral health (Peterson, et al, 2005; WHO, 2005).

At the year 2006, Khader reported that several forms of periodontal diseases are clustered in the minority of individuals in a given population and that high risk individuals. The severity of their problems should be identified and evaluated so that preventive measures and treatment procedure can be provided in a cost –effective manner. The periodontal diseases must be prevented and diagnosed early in the life and the periodontal diseases risk factors must also be identified (Ketabi, 2006).

 In Middle East, few studies had been carried out during the last 20 years on the prevalence of periodontal diseases. It was evident that the oral health situation is fluctuating; this may be due to the lack of national oral health plans (Hussein, et al, 1996).

The global goals related to periodontal diseases which aspirate to achieve at 2020 are:1.Increase the proportion of people with healthy periodontium in all ages; 2.Reducing exposure to risk factors which associated with periodontal diseases such as nutrition ; 3. Reducing the number of teeth lost due to periodontal diseases in all ages with special references to smoking, poor oral hygiene, stress and inter- current systemic diseases (WHO & FDI, 2003).

Periodontal diseases are much more prevalent and more severe problem in the developing countries because of poor oral hygiene at a young age (WHO, 1998). The severity of these periodontal diseases is largely affected by social factors, age, sex occupation and socioeconomic status (Al-kazragi, 2001). Several surveys have been carried out to evaluate the prevalence of periodontal diseases all over the world using standardized surveys and indices. The most commonly used index is CPITN which describes the prevalence of periodontal diseases in an individual and is obtained by calculating dental pocket depth and gingival bleeding examination in six sextants of the mouth in each individual (Hobdell, et al, 2003; WHO, 2005).

1.3 Background of oral health in Palestine

There were several studies and data on the oral health in the western countries (Douglass, et al, 2002; Maojon, et al, 2004) and in China and Japan (Lin, et al, 2001; Hanioka, et al, 2007). Some studies (Nihtila, et al, 1998; Namal, et al, 2005) have collected and summarized data on the oral health of young adults and middle age individuals. While few data were reported on the dental status in the developing countries which demonstrated some patterns of teeth loss by populations (WHO, 2008a). No updated information or comparable data similar to the above studies are available in Palestine or in Nablus city particularly.

The estimated Palestinian population according to (Palestinian Central Bureau of Statistics (PCBS, 2009) were 3,935,249, with natural increasing percentage of 2.9% (2.6 % in West Bank, 3.3 % in Gaza Strip). Geographically, Palestine is located in the Eastern Mediterranean Region (EMR).

According to the Palestinian health information center in the Ministry of Health (2009), The oral health care in Palestine have been classified into two categories : public and private sectors which include the majority of dentists , in Palestine there are five main providers for health services in which oral health services are delivered:

1. The main provider is the Ministry of Health (MOH): The MOH bears the heaviest burden of services delivery and distribution, oral health services are provided basically through primary health care services. The MOH operates 47 dental clinics, 23 clinics in the West Bank and 24 clinics in Gaza strip (PCBS, 2008). In 2009, the MOH operates 52 dental clinics, 28 clinics in the West Bank and 24 clinics in Gaza strip, and there were 2279 cases of scaling and polishing (41.2% in West Bank and 58.8% in Gaza strip (PCBS, 2008, 2009).

2. The UNRWA: which is the major service provider for those registered as refugee for free of charge; services include preventive and curative oral health services within the primary health system. It operates 37 dental clinics (15 in Gaza strip and 22 in the West Bank) (Shaheen, 2008).

3. The Non- Governmental Organizations (NGOs) and charitable societies. They operate 9 dental clinics in the West Bank (Shaheen, 2008).

4. The private or profit sector.

        5. The military services: this sector provide oral health services for the military
                                                  occupants and their families.

According to the literature, in Palestine the trend of periodontal diseases is not thoroughly known (Sabhaa, 2007), although oral health human resources are available. According to the Palestinian National Strategic Planning for health records (2008), the total number of dentists in Palestine is 2035 (1355 in the West Bank and 680 in Gaza). The dentist/population ratio is 1:1910 which is considered as suitable ratio as compared with analogue ratio in developed countries which is 1:2000 (Corbet, et al, 2002). Also it is noticed that there is a misdistribution of dental clinics and dentists in Palestine, which is directed towards urban areas and preference for working in private clinics rather than the public health sector. All above, have a

marked contribution on the level of prevalence of periodontal diseases and dental caries in Palestine.

1.3 Problem Statement

There is increase in the prevalence of periodontal diseases all over the world, which represent a major public health concern, although of this trend of periodontal diseases increase in the world and in some of the surrounding Arab countries; in Palestine, to date, no study has been conducted to estimate the prevalence of these periodontal diseases ,especially, for schools' students, and the trend of periodontal diseases in Palestine is unpredictable and not clear, although it is important to measure such diseases as a determinant of oral health. This investigation is designed to clarify the situation of such diseases among Palestinian population, prevalence and the risk factors associated with the periodontal diseases, to promote sustainable, priority – driven policies and programs in oral health systems to prevent and control such diseases.

1.4 Study justification

Vast majority of countries including Palestine need to establish a surveillance system for measuring the progress in the control of periodontal diseases and promotion of oral health (WHO, 2005). In view of the lack of elementary oral health studies concerning periodontal diseases in our country, the researcher has chosen Nablus city to accomplish this research study on 15-years old students.

Nablus is a Palestinian city in the northern West Bank, approximately 63 kilometers, north of Jerusalem, with a population of 321,000 citizens, Located in a strategic position between the Mount Ebal and the Mount Gerizim. Nablus is a large commercial, cultural and a very well known historical city (Nablus. Org, 2010).

The researcher has chosen the 15- years old students in this study because this age is located in the middle teenage stage (WHO, 2005). According to PCBS the (15-19)

years old are called teenagers. The percentage of population 15-24 years increase from 51.1% in 1997 to 55.3% in 2007 from the total population in Palestine which is represents the percentage increases 4.2% (2008). Again, according to PCB (2009) the number of (15-19) years old individuals are 478,350 (295,191 in West Bank, 183,159 in Gaza Strip) from 4- millions Palestinian population.

Also this age group was selected for this study because this age is important for the assessment of periodontal diseases indicators in adolescents, and data from persons of this age groups can be compared in future with the data for 12-years olds to provide an estimate of increases in prevalence and severity of periodontal diseases (WHO, 1987).

Moreover it has been estimated that more than (82%) of adolescents in the united state have overt gingivitis and signs of gingival bleeding. Similar or higher prevalence of gingivitis has been reported in children and adolescents in other parts of the world. Gingivitis is a reversible condition, which expect for indicating the level of oral hygiene in the population and also may indicate to the futural periodontal loss (Albandar, 2005).

1.5 Study aim and objectives

The aim of this study was to assess periodontal diseases among Palestinian school students' aged 15- years in Nablus city according to oral hygiene level, smoking habits socioeconomic status, and nutritional habits and to investigate the relationships between these risk factors and periodontal diseases.

Specific objectives

1- To measure the prevalence of periodontal diseases among Palestinian school students' aged 15- years in both governmental and private schools in Nablus city.

2- To investigate the association between oral hygiene level and periodontal diseases among Palestinian school students' aged 15- years in Nablus city.

3- To investigate the association between smoking and periodontal diseases among Palestinian school students' aged 15- years in Nablus city.

4- To investigate the association between socioeconomic status and periodontal diseases among Palestinian school students' aged 15- years in Nablus city.

5- To investigate the association between the type of nutrition and periodontal diseases among Palestinian school students' aged 15- years in Nablus city.

1.6 Hypotheses

The following hypotheses were tested at level of significance: $\alpha = 0.05$

1- H_0: There is no association between periodontal diseases and oral hygiene level in Palestinian school students' aged 15- years in Nablus city.

2- H_0: There is no association between periodontal diseases and smoking in Palestinian school students' aged 15- years in Nablus city.

3- H_0: There is no association between periodontal diseases and socioeconomic status in Palestinian school students' aged 15- years in Nablus city.

4- H_0: There is no association between periodontal diseases and nutritional habits in Palestinian school students' aged 15- years in Nablus city.

1.7 Research Questions

1. What is the prevalence of periodontal diseases among Palestinian school students' aged 15- years in both governmental and private schools in Nablus city?

2- Is there an association between oral hygiene level and periodontal diseases among Palestinian school students' aged 15 -years in Nablus city?

3- Is there an association between smoking and periodontal diseases among Palestinian school students' aged 15- years in Nablus city?

4- Is there an association between the socioeconomic status and periodontal diseases among Palestinian school students' aged 15- years in Nablus city?

5- Is there an association between nutritional habits and periodontal diseases among Palestinian school students' aged 15- years in Nablus city?

1.8 Thesis chapter's description

This thesis has consisted of 6 chapters. Chapter one includes the description of the study aim, problem statement and study justification and the objectives. Chapter two presents the literature review of previous studies that are related to research topic. While in chapter three, the theoretical and conceptual framework for the study will be discussed. In chapter four, study methodology, data collection methods, sample size, piloting and statistical analysis for data are presents. While in chapter five, study results will be presented and demonstrated in form of tables and figures. While in chapter six, the study results and its findings will be discussed and recommendations will be presented.

CHAPTER TWO

Review of the Literature

2.1 Risk Factors for Oral Health

Causal chain of exposure leading to diseases.

Health throughout the life is continuously exposed to countless of risks. Risk is defined as the probability of an adverse outcome, or a factor that raises this probability (Rothman, 2002). (WHO, 2002a) presented risks evidence to health and the burden that related to the diseases impose on the populations. According to this report, no risk arises in isolation, and generally, each disease stems from a complex chain of causes. An adverse health outcome might have indirect (distal), direct (proximal), or specific local (biological) causes or a combination. The indirect factors including social gradients and socioeconomic status (SES) factors, environmental, cultural and demographic risk indicators, and health system. The health –system factors are risks that mostly occur at population level (Hobdell, et al, 2003; Peterson, 2005). SES indicators such as education, occupation and income are some determinants of social status. The indirect factors usually help to shape direct factors like psycho-social and behavioral factors that are formulated the lifestyle ;and individuals may have control over these factors (Sheiham & Watt, 2002).Biological causes are specific factors operating locally within the host's body ; their effects were assessed –independently for each disease (Burt, 2005). Recently (WHO, 2008) has reported that ,a new life –course approach has helped to explain the existence of wide

socio-economic differentials in outcomes and sequels of chronic diseases like periodontitis .

Systematic factors assessment may be influential in the planning of oral health-promotion programs. Studying the status of disease at various ages may facilitate the identifying of appropriate periods in the life when the risk of disease is highest, and well indicate that when and where intervention is most required (Petersen, 2005).

2.2 Measurement of periodontal diseases

Instruments for periodontal diseases screening are commonly applied to populations in epidemiological studies of oral health. Several tests or indices have been developed for this purpose. Due to the growing impressions of inadequacy in the existing instruments, new era has been developed for efficient and simple way to screen populations' periodontal diseases (Hunt &Fann, 1991).

The dental professionals are faced with the dilemma of diagnosing conditions relating to periodontal tissues. There are conflicting perceptions of disease, progress, and severity in young adults. Evaluation of periodontal diseases burden have an ongoing controversy discussions about a globally case definition of periodontal diseases (Albandar, 2007). The choice of different index systems as well as differences in the interpretations to clinical and epidemiological aspects were varies between studies (Burt & Eklund, 2005).

Within the last 15 years, the Community Periodontal Index of Treatment Needs (CPITN) has become widely accepted as the method of choice for the studies of periodontal diseases (Strohmenger, et al, 1991; Miyazaki, et al, 1992;Who, 1997).Many modifications had been made on the early index forms (WHO, 1976, 1978). Nevertheless, the instruments of diagnostic criteria were basically unaffected by the modifications. Recently Bassania et al (2006) in their study have assessed CPITN operational characteristics (comparing CPITN with standard exams/diagnostic criteria).The results showed that 58% sensitivity for full CPITN and 80.6% specificity. Positive and negative predictive values were 87% and 46.3%, respectively. The trend for lower values observed for the partial version of the CPITN in this study may reflect the fact that only ten teeth contribute to the diagnosis (Diamanti-Kipioti, et al, 1993).

2.2.1 Criteria of CPITN coding

Each sextant in the mouth was assigned a code number and the condition of the worst affected site in that sextant was recorded, the subjects were classified into treatment needs categories, according to the highest score number assigned to any sextant of their mouth. The index teeth examined for adults aged 20 years and over were (17, 16, 11, 26, 27, 37, 36, 31, 46 and 47) but for subjects under 20 years only six index teeth (16, 11, 26, 36, 31 and 46) were used (WHO, 1997, 2005). This difference avoided scoring the deepened sulci which associated with the eruption as periodontal pockets. For the same reason, when children under 15 years were examined, pockets were not recorded; only bleeding and calculus are recorded.

Table 2.1: The relation between the criteria and scores of (CPITN), treatment category (T), and type of care and time units estimate (TU) per sextant.

Criteria	CPITN	T	Type of Care	TU(time units)
Healthy	0	T0	None	0
Gingivitis	1	T1	OHE	1
Calculus	2	T2	OHE+Sc**	3(1+2)
Pockets>3mm	3	T2	OHE+Sc	3(1+2)
Pocket<3mm	4	T3	OHE+Sc+C***	7(1+2+4)

*Oral hygiene education, **Scaling and root planning, ***Complex treatment

Advantages of CPITN :

1. It is easy to use.

2. It permits rapid examination of large population groups.

3. Its world-wide application allows for international comparisons.

4. (CPITN) is used to determine periodontal conditions as well as periodontal treatment needs.

5. The use of (CPITN) provides a picture of the public health requirements in the periodontal field, which is essential for national oral health policy-making and specific interventions (Benigeri, et al, 2000).

Limitations OF CPITN:

1. An overestimation of treatment needs.

2. This index is based on a hierarchical concept of progression of periodontal diseases. Thus, a sextant presenting a tooth with a periodontal pockets (score 3 or 4) should also present calculus (score 2) and bleeding (score 1).

3. It does not measure dental mobility and attachment loss. It is thus important to keep in mind that the CPITN is not a complete measure of periodontal disease (Benigeri,et al,2000).

Validating a test is necessary for screening and it has been determined that some of the periodontal screening tests tend to underestimate disease prevalence (Baelum,et al,1995).It has also been reported that in some situations periodontal screening instruments may overestimate disease (Benigeri,et al,2000; Landry,et al,2002). Periodontal diseases varies considerably among populations and that severe limitations in the current disease descriptors exist (Kingman,et al,1991; Eley & Cox,1998).

2.3 Epidemiology of periodontal diseases

Epidemiology is the study of the health and disease in populations, as compared to individuals (Last, 2001). Study of the distribution of human periodontal diseases and their risk factors on a global scale offers a unique investigational model that can provide power and generalization the observations on the periodontium which made initially among limited populations. Assessing causation between periodontal diseases and their suspected etiologic risk factors is useful to demonstrate consistency of the relationships in multiple, representative population samples. In previous decades, numbers of dental studies were undertaken to assess the prevalence of periodontal diseases in different populations all over the world, from these studies are:

2.3.1 Globally:

In the last two decades; in the Western countries; remarkable changes were occurred in the socioeconomic and environmental risk factors which were in turn related to the oral health .In parallel to these changes, changing in oral and periodontal health were occurred. The previous published studies (Mengel,et al,1993; Micheelis&Reich, 1999) did not provide sufficient information on prevalence and extent of periodontal

diseases in European populations,but the recent studies found that the Prevalence of sever periodontitis were ranked the highest in Europe (Holtfreter, et al, 2009) . Holtfreter , et al (2010) said in their study that periodontal diseases prevalence exhibited a clear age gradient. According to the recent CDC-AAP classification; moderate and sever periodontal diseases respectively were prevalent in 50% and 28.2% of the adult dentate population (35-74 years old) .Estimating that about 40 millions individuals of the German population are dentate, there were about 31.3 millions dentate subjects exhibited periodontal treatment needs.

In Japan, Esaki et al (2010) found in their study that the percent distribution of subjects according to CPI codes was 19.9%,14.9%,34%.4,24.1%, and 6.6% for CPI codes 0,1,2,3 and 4,respectively. The number of subjects according to bleeding on probing percent (BOP).Two- thirds (66) %of the subjects had 20% or less sites of bleeding on probing. The male subjects had a significantly higher percentage of bleeding (mean=28.8,s.d.=33.2) and higher CPI score (mean=2.08,s.d.=1.19)than those in the female subjects (mean=21.1,s.d.=29.6) for BOP% and (mean=1.79,s.d.=1.18 for CPI score).The subjects who did not perform inter-dental cleaning had significantly worse CPI scores (mean=1.98,s.d=1.18) than those for subjects who performed its sometimes (mean=1.61,s.d=1.20) or everyday (mean=1.69,s.d=1.17). BOP % and CPI score were significantly higher in subjects who never visited a dentist than that in subjects who visited a dentist regularly. The correlation coefficient of BOP % and CPI scores with age, BMI and intake level of all dietary nutrients. There were significant negative correlations of calcium, iron, vit.A, vit.C , and folic acid with BOP% and significant positive correlations of age, total protein, and calcium with CPI scores .

 In Brazil, there were only two national surveys have covered the age range from 15 to 19 years, and both have been shown that dental diseases were greater in 15 to 19 years old than among 12-year olds (Ministério, 1988; Condicoes, 2004)).Studies have been conducted (Maria, et al,2009) to characterize the oral health of adolescents and young adults from 15-19 years old. This study also reported that the population showed that the prevalence of gingivitis 94.71% and the greatest percentage of these cases consisted of mild gingival inflammation, followed by moderate. There was no significant difference between the sexes in relation to gingival bleeding.

A study in Spanish military personnel (Rafael & Carmen, 2008) reported that only 7.2% of the examined sample showed healthy gingiva, but 10.1% presented bleeding and calculus was present in 72.6%, and 7.8% and 2.3% respectively had pockets of the 4-5 mm and 6mm or more.

In Hispanic Americans, Novak et al (2008) said that diabetes is a major factor for the development of periodontal diseases in certain populations. Type 2 diabetes in Hispanic Americans was associated with significantly more calculus formation and teeth loss and increase the extent and severity of periodontitis. Subjects with diabetes had nearly three times the mean clinical attachment loss and frequency of periodontitis > 6mm than subjects without diabetes and nearly twice the frequency of moderate to advanced attachment loss (<3mm). Studies from Finland indicated that subjects with poorly controlled type 1 and type 2 diabetes demonstrated more gingival bleeding, more periodontal pockets, and had an increased prevalence and severity of periodontitis and calculus formation (Tervonen,et al,1993).

Periodontal diseases were least prevalent in Sweden (Hugoson, et al,2008), and Switzerland (Menghini, et al,2002). In Lithuania, 82% of the 35-44 years old subjects and 95% of the 65-74 years old subjects showed at least moderate probing depth (PDs) (Skudutyte, et al, 2001).

According to (WHO, 2005) ,the worldwide study showed that the children and the adults have signs of gingivitis, initial stages of periodontal diseases were prevalent, that leads to the premature teeth loss during puberty .Advanced diseases with deep periodontal pockets (≥6 mm) affects 10% to 15% of the adults.

The prevalence of bone loss among 15-years old school students (Lennon & Davis, 2005) who were living in an industrial area in the North-West of England was (46%). The students had loss of attachment ≥ 1 mm, which including 11% who had loss of attachment ≥ 2 mm carried on at least one tooth. Students of West Indian or Indo-Pakistani origin were most severely affected.

The prevalence of periodontal diseases was studied by Hansen et al (2005) on 15-years old school students living in the Norway. Bone loss around one or more teeth was found in 11.3% of the subjects. More males than females were affected with the

prevalence of 13.7% and 9.0%, respectively. This study has demonstrated that alveolar bone loss is a common finding in 15-year-old school students.

Gilbert (2005) has describe a prospective study of persons in Florida >45 years old. In- person interviews and examinations were conducted .The study size was 560 persons, 22%of persons and 1.8% of teeth had attachment loss incidence.

Gingival and periodontal problems made up (6.73%) of the emergencies of oral origin among Spanish military personnel deployed who were in Bosnia-Herzegovina (Moss, 2002). Data that obtained from the US army were published between the year 2000 and 2003 gave figures that gingival and periodontal problems ranged from 2.8% to 9.6% from the sample (Dunn, et al, 2004).

In other developed countries, the prevalence of gingivitis in children had reported as found to be 61.5% in the USA (Bhat ,1991) , 85% in Australia (Spencer ,et al.1983) ,70% in India (Vorma, et al ,2002),and chronic mild gingivitis is the most common in the observed periodontal diseases in children (Masiga, et al.2004).

According to the comparative tables of Sheiham &Netuveli (2002),using CPITN and summarizing the available data in WHO database, the percentage of European middle-aged individuals with CPITN=3 ranges from 13% to 54%.For the western Europe , the mean percentage of middle-aged individuals with CPITN =3 is 36% and for Eastern Europe it is 45%.These finding are similar for non-European rich economies but higher than for the poorest countries in the database. The percentages of adults with deep periodontal pockets (>5.5 mm) is between 30% and 40% in some Eastern Europe countries.

In developing Countries: Periodontal diseases prevalence was 100%, with bleeding and shallow pocket consist a major part (72.8%) of these periodontal diseases in India (Jain, et al, 2009). (Kazemnejad, et al, 2008) reported that in Teharan ,there was only 11.3% of students had a healthy periodontium (CPI score :0 for all sextants). Also 12.0% of students had bleeding on probing, 46.0% had gingival calculus, 30.4% had shallow pockets and 0.3% had deep pockets in their jaw sextants.

Little published researches have been conducted on the oral health status of the disabled population (Newacheck,et al,2000). Kumar,et al (2009) in their study on 171 mentally disabled Indian students reported that only 3.5%, were without periodontal

diseases .In normal population of Rajasthan state, the percentage of 12- and 15-years-old children who were without any signs of periodontal diseases was 66.8% and 49.2%, respectively. The mean number of healthy sextants in the study population was 0.8 for the age group 13-16, whereas in the normal population of the comparable ages in Rajasthan state was found to be 3.7 (Bali ,et al, 2003) .Similar results were founded by (Martens ,et al, 2000; Mitsea, et al,2001; Seymen, et al,2002) who reported that, the individuals with disabilities had showed poor levels of oral hygiene and high prevalence of periodontal diseases.

Eres (2009) have examined 3056 students between the ages of 13 to 19 years at public schools in Turkey. The students' mouths were coded according the recommendations of the CPITN. Among the 3056 students which screened, the prevalence of localized aggressive periodontitis was 0.6% with a female to male ratio of 1.25:1.

In Iran , Ketabi et al (2006) found in their study that The prevalence of gingivitis was 73% among the children. With increasing the age from 6 to 11, the severity of gingivitis was increased. In all age groups, level of oral hygiene was superior in girls. Poor oral hygiene, lower family income, and lower level of mother's education had negative effects on gingival health, and they found also that the prevalence of gingivitis was more in boys than girls ,but this difference was not statistically significant .This agrees with result s of Kelly and Sanchez study(1972). Ketabi et al also showed that the oral hygiene negligence was the most important factor in developing gingivitis in both sexes at different ages which is in agreement with most of the similar studies. One interesting result of this research was that the level of mothers' education had positive influence on gingival health of the child .This finding shows that the higher educated mothers can influence their child's attitude about oral hygiene procedures. The child family income had direct influence on gingival condition.

In Tanzania, among Burundian 22% of adults had one or more CPI index teeth with periodontal pockets >4 mm and 67% had hard deposits (calculus).Among Congolese, Almost 40% of adults had one or more CPI index teeth with periodontal pockets >4 mm and 60% had hard deposits (calculus).T here were no adults with just bleeding on probing ,all had more serious periodontal involvement (Beltran,et al,2006).

2.3.2 Regionally

In Syria, The majority of 15-24-year-olds, and more than 80% of the 35-44-year olds had calculus. Despite the widespread and chronic existence of calculus, only 3-11% of the 35-44-year-old persons had one or more deep periodontal pockets (Beiruti, et al, 2001).

Kazem &Albandar (2006) said that there was a considerable variability in the prevalence of aggressive periodontitis in Syrian school students within 4 geographic regions (4.67%, 2.90%, 2.24%, and 1.22%, p=0.01) suggesting different levels of exposures to etiological and risk factors. Prevalence rates were similar in rural and urban schools (p=0.7), higher in males than females (3.4% vs. 2%, p=0.07).

In Jordan investigation was conducted to assess the prevalence and severity of periodontal diseases with ages ranging between 15 and 44 years individuals. (Rababa'h et al 1998) found that 20% of 15-19 years old have gingival bleeding, 35% have shallow dental pockets and 0% with healthy periodontium. From this study the authors concluded that the total amount of care needed cannot be provided by any single public health agency. (Rababa'h, et al, 1998).

In Beirut\Lebanon, Hussein et al (1996) had conducted a pilot pathfinder study to identify the level of the periodontal disease. The obtained results showed that the prevalence of periodontal diseases among 15 years old students were the highest (94.5%) in the Eastern Mediterranean.

2.4 Reviews on the periodontal diseases' risk factors

There are several reports in the literature describing the prevalence of periodontal diseases among different nations in the world. These reports are considered to be essential for the treatments in each country in order to set plans and strategies to eliminate periodontal diseases. Also these reports can make it easy for the scientists and health organizations to compare the prevalence of these diseases from one country to another (Hessari, 2009). Continuing surveillance of patterns of risk factors associated periodontal diseases is of fundamental importance to planning and evaluating community preventive activities and oral health promotion (Petersen & Ogawa, 2005).

Sood et al (2010) in their clinical and radiographic examinations, found that the periodontal diseases in dental students were affected the males more than the females.

Faresi (2010) in her study explored the relationships between dental visit patterns and periodontal health in a representative sample of the young Saudi Arabian population. She found that the prevalence of periodontal diseases was significantly lower among subjects who were taught the right way to brush their teeth by the dentist. The highest occurrence of healthy periodontium (23.9%) and the lowest need for complex treatment (0%) were found among students who had annual reminders for check-ups. Faresi also pointed to the reasons for dental visits and association between these visits with CPITN. Pain and dental problems were the most common reason to visit the dentist, followed by random check-ups. The subjects who were reminded for the annual visit by their dentist had the highest occurrence of healthy periodontium (23.9%) and none needed complex oral treatment. In this study 60% of individuals had visited the dentist in the previous year, 8.6% had received regular check-ups and only 2.8% were reminded of annual check-ups by the dentist.

 Jain et al (2009) found in their study that an Indian population (Jain monks) has poor oral hygiene and an increases prevalence of periodontal diseases compared to the similar aged normal population. Many Jain monk individuals avoid brushing their teeth especially during fasting. This study also confirmed the relationships between nutrition and periodontal diseases. Nutrition has both local and systemic impacts on the oral cavity. While diet and eating patterns have a local effect on the teeth, saliva, and soft tissues, the systemic impact of nutrition also has a considerable implication.

Rosania et al (2009) showed in their study that the stress associated with periodontal destruction through behavioral, physiologic mechanisms and addressing psychological factors, such as depression, may be an important part of periodontal preventive maintenance.

Kazemnejad et al (2008) in their study on school students in Teheran, reported that periodontal diseases were more prevalent in females, odds ratio (OR = 1.83), in students who had fathers and mothers with low educational level (OR = 4.8), or moderate educational level (OR = 1.46) , students who did not use a toothbrush (OR = 7.0) or floss regularly (OR = 12.76), and students who referred to dentists only in emergency situations (OR = 1.82).

Vallejos et al (2008) found that certain characteristics of the mothers were associated strongly in patterns of oral hygiene with their children .They found that teeth brushing patterns generally were favorable, especially that behavior associated with certain social and socioeconomic factors of the children mothers' .Furthermore, features of the mother with regard to the child's oral health are differentially associated with teeth brushing trends, particularly under more desirable patterns of dental attendance. In turn the characteristics of the mothers were associated with periodontal health status of their children.

Localization of bacterial plaque on the gingival edge of the teeth plays a fundamental role in the genesis of the gingival problems. The pathogenesis of periodontitis is more complex, involving microorganisms in the sub-gingival plaque and the response of the host. Several systemic pathological conditions can also associated with periodontal pathology. The influence of age, sex and rank on periodontal health status was assessed and found that the cohort aged less than 25 years had a higher prevalence of calculus and no pockets of 6mm or more. The presence of 4-5mm pockets was (12.9%) in the population of ages who were over 25 years ,while periodontal pockets of 6mm or more were only found in 4.5% of ages who were over 25 years old .The women were healthier than the men ,in a statistically significant degree (Rafael & Carmen ,2008).

Metabolic syndrome is common among Arab Populations in Mediterranean countries. Patients with metabolic syndrome displayed more severe and extensive periodontal diseases compared to subjects without metabolic syndrome (Khader, et al, 2008).

Williams (2008) stated that in the Administration Hospital in Boston , not all individuals were equally susceptible to periodontal diseases .There are specific factors that confer risk and susceptibility to periodontal diseases. These factors included various environmental, acquired, and inherited risk factors for periodontal diseases, including diabetes mellitus, tobacco smoking, poor oral hygiene, stress, race, and gender.

Hashim et al (2008) stated in their study that smoking in adolescence is a predictor of early loss of periodontal attachment. Chronic exposure to cigarette smoking is a risk factor for greater prevalence and extent of periodontal loss of attachment among young adults.

Ali (2007) has investigated the effect of a common habit, qat chewing, among Yemeni population on the periodontal status. The results shown that habit of qat can cause damage to the periodontal ligament as pocketing and gum recession. These effects were found to increase with increased frequency and duration of chewing.

Salman (2007) in his study proposed that plaque control is the main method for prevention of gingivitis .The adjunctive dental cleansing activities as chlorhexidine mouth rinse is widely recognized in helping to maintain plaque control and resolution of gingivitis. This explained the cause that the school children of (11-13)years old who were suffering from gingivitis with significant plaque .These results demonstrated that highly improvement of oral health in children who were used chlorhexidine mouth rinse continuously.

Khader (2006) conducted a study to identify factors associated with periodontal diseases in a Jordanian population using principal component and factor analysis techniques. 603 dentate patients aged 15-65 years old who were attending the dental teaching clinics at the Jordan University. The results demonstrated that elderly ages, low level of education, high plaque index score, non brushing teeth, smoking more than 15 pack-years, and diabetes were significantly associated with increased severity of periodontal diseases.

Bergström (2006) investigated retrospectively patients who were admitted to the School of dentistry in Stockholm. He found high prevalence and sever periodontal diseases in smokers, the risk ratio was 2.5. Further, significantly greater frequencies of periodontaly involved teeth and diseased sites were found in smokers.

Levin et al (2006) found that there was high prevalence of aggressive periodontitis among young Israeli army recruits, which was particularly associated with smoking and ethnic origin.

Sam et al (2006) in their study investigated the relationship of periodontal diseases, in terms of clinical attachment level, to psychosocial stress. The authors stated that the individuals with high mean clinical attachment loss values had higher scores on the job and financial strain scales than periodontally healthy individuals. Chronic job and financial strains, depression, inadequate coping, and maladaptive trait dispositions are

significant risk indicators for periodontal attachment loss. Adequate coping and adaptive trait dispositions, evidenced as high problem-focused coping and low anxiety/depression trait, may reduce the stress-associated odds.

According to (Peterson, 2006): Smoking increases the risk of getting gum disease by 4-times more than nonsmokers. Smoking responsible for more than half of the adult gum diseases. Smokers have higher number of gum diseases , greater loss of bone and increased teeth loss. Severity of the disease increases with extent and duration of smoking exposure. Diabetes is the sixth leading cause of death in U.S. Almost one-third of individuals with diabetes have periodontal diseases. Periodontal diseases in diabetics resulted bone and attachment loss at earlier ages, and the rate of advance disease is 3- times higher and promoting osteopenia .

Ketabi et al (2006) found in their study that the prevalence of gingivitis was 73% among the children. With increasing the age from 6 to 11, the severity of gingivitis was increased. In all age groups, the level of oral hygiene was higher in girls. Poor oral hygiene, lower income families, and lower level of mother's education had negative effects on gingival health. Also they found that the prevalence of gingivitis was more in boys than girls .One interesting result of this research was that the level of mothers education had positive influence on gingival health of the child .This finding shows that the higher educated mothers can influence their child's attitude about oral hygiene procedures.

Jolanta et al (2005) in their study , of children (10-15 years old), found that there was no statistically significant differences in the mean values of Simplified Oral Hygiene between the diabetics and non diabetics. Healthy gingiva was recorded in 73% diabetics, and 87% of the non-diabetics. This means that the diabetics were more prone to development of gingival inflammation. The presence of dental calculus as a local risk factor which associated with gingivitis become sever problem in the individuals with type 1 diabetes mellitus. Additional care for prevention of plaque and calculus accumulation could be recommended particularly in patients with poorly controlled diabetes.

Akhter et al (2005) had found significant association between stress factor and periodontal diseases in residents of a rural area in Japan. Those who felt stress were

more prone to have periodontal diseases than who were never or only rarely felt such stress (OR=1.72). The authors suggested that stress related to self health and job might be potential risk indicators for the development of periodontal diseases. Intervention measures including stress reduction may provide adjunctive approaches for preventing and treating periodontal disease.

Borrell et al (2005) stated that varying factors of ethnicity, socio-economic status, and educational levels affects the presentation levels of periodontal diseases .The authors found that decreasing the levels of periodontal diseases in part is due to the increase in awareness, increase in education and socio-economic status, and the decrease in the smoking habits of individuals.

Thomas (2005) said that there are acquired (modified) and inherited (non-modified) risk factors associated with periodontal diseases. Smoking is from these factors which are can be modified and the relationship between smoking and periodontal diseases is doses dependant negative association. Odds ratios for developing periodontal diseases as a result of smoking range from 2.5 to 3.97 for current smokers, 1.68 for former smokers, 3.25 for light smokers and 7.28 for heavy smokers. Nutrition is from the risk factors which associated with periodontal diseases also can be modified .Diabetes mellitus as chronic disease is considered as a non modifiable risk factor that associate with periodontal diseases. In other words there is a directional relationship between periodontal disease and the glycemic control. The author report that individuals under psychological stress are more likely to develop clinical attachment loss and loss of alveolar bone perhaps is simply due to the fact that individuals under stress are less likely to perform regular good oral hygiene and prophylaxis.

Luisa et al (2005) has been reported that periodontal diseases are more frequent and more sever among individuals with low socioeconomic status (SES) than among their peers with higher socioeconomic status. Individuals level income and education were associated with sever periodontitis among Whites and African Americans.

Doll et al (2004) stated that more than half of smokers die from their habit and half of these deaths occur in middle ages. The adverse effects of tobacco on oral health are well documented (Reibel, 2003). These include both common and rare conditions of diseases; some harmless and some life-threatening, such as staining and discoloration

of teeth and dental restorations, halitosis, effects the taste and smell acuity, wound healing, periodontal diseases. Bergström (2004) reported that the risk of destructive periodontal disease is 5–20-fold higher for the smoker compared with the never-smoker. There is a dose-dependent relationship between periodontitis and smoke exposure, and treatment outcome for smokers is inferior to that of non-smokers. "Tobacco smoking is the main risk factor associated with chronic destructive periodontal disease". In developing countries the dentists play a pivotal role in preventing harmful effects of tobacco, as part of evidence-based intervention systems (Johnson, 2004). Global oral health programme (Petersen, 2003) and the WHO Framework Convention on Tobacco Control (2005) are significant advances in controlling related diseases. Emphasis is given to tobacco prevention activities in schools and development of national and community-based tobacco programmes in low- and middle-income countries. Furthermore, the tobacco control advocacy guided written jointly by WHO and the FDI World Dental Federation (Beaglehole, 2005) provides a constructive platform for the participation of oral health professionals in future tobacco control programmes (Jesper, 2005).

Kerdvongbundit &Wikesjo (2003) said in their study, on sixty smokers and sixty never smoker in Thailand, that smoking is associated with periodontal diseases prevalence and severity in patients with high oral hygiene standards who regularly receive dental care.

 In the industrialized part of the world, two major factors have been identified as possibly influential in altering the epidemiological characteristics of periodontal diseases over time: 1.improved oral hygiene levels 2. Changes within the dental health profession towards more conservative approaches to the treatment of periodontal diseases, in particular destructive periodontal diseases (Baelum, et al, 2002).

Sbordone et al (1998) in their study, had not find significant differences in clinical periodontal parameters between the insulin dependent juvenile diabetics and their non-diabetic siblings. Pinson et al (1995) showed that individuals with diabetes mellitus had an increased rate of gingivitis with non-diabetics, as well as diabetics had higher dental plaque indices (Marsh & Nyvad, 2003) compared with non-diabetic controls. It has been stated that diabetes mellitus as such does not cause gingivitis and \or periodontal pockets, but there are indications that it alter the responses of the

periodontal tissues to local factors (Klokkevold , et al, 2002). One of the predisposing local factors related to the development and progression of gingival inflammation could be dental calculus (Hinrichs,2002).

According to Neil (2003) there are three most important systemic risk factors associated with periodontal diseases which are: 1- smoking,2- diabetes mellitus, and 3- osteoporosis\osteopenia .

1. In the United State population the smoking are increased the risk of the population to periodontitis almost four times .Smoking may be responsible for more than half of the adult's periodontitis cases among current smokers .They suggested that a large portion of periodontitis may be preventable through prevention and cessation of cigarette smoking. Smokers are have a higher number of periodontal diseases sites, greater loss of alveolar bone and increased teeth loss. The severity of the disease increases with both the extent and duration of smoking exposure .Nicotine and other toxic substances in tobacco smoke lead to increase periodontal breakdown by altering the host ability to neutralize the infection by inducing deleterious effects on various neutrophil functions that are vital for maintenance of gingival and periodontal health .

2. Diabetes Mellitus has been reported that diabetics have an increased susceptibility to periodontitis. Bone formation has been shown to be suppressed, which can promote osteopenia in the alveolar bone, with loss of crestal bone height as well as the rest of the skeletal system. However, it has also been found that the relationship between diabetes and periodontal disease is bidirectional. While diabetes has been known to create more severe periodontal diseases, the periodontal diseases can also exacerbate the diabetic conditions.

3. Osteoporosis/osteopenia has been reported (Neil, 2003), as a risk factor for periodontal disease. The osteoporotic/osteopenic women compared with women with normal bone mineral density exhibited a higher frequency of alveolar bone height loss and crestal and subcrestal density loss.

In low income countries such as Bangladesh, India and Kenya, are with low socioeconomics, and illiteracy in addition to inadequate personal oral health and tobacco smoking, all these have been proposed as risk factors for periodontal diseases (Corbet, et al, 2002).

Al-kazragi (2001) said that nutrition and smoking act as risk factors for periodontal diseases. Oral hygiene is the primary etiological agent, but vit.A,C, protein deficiency and smoking are predisposing factors. The smoking effects are causing irritation the gingival. The author said that periodontal diseases were least prevalent in Sweden and Switzerland.

Hennequin et al (2000); Glassman(1996); Boj et al (1995); Brandes et al (1995); Dicks (1995) reported that in spite of the high level of dental diseases, individuals with disabilities or illnesses receive less oral care than the normal populations. Some of the most important reasons may be inadequate recall systems, practical difficulties during treatment sessions, socioeconomic status, underestimation of treatment needs or pain, communication problems and bad cooperation.

Al-Kahateeb et al (1990) reported that a group of diabetic patients living in an Saudi Arabian Community were matched by sex and age with a non- diabetic control group.Examination for periodontal status was carried out on the matched pairs .Diabetics exhibited more gingival inflammation and increased probing depth when compared with age-sex matched controls.

Abdellatif et al (1987) analyzed obtained data from a representative national sample of 14,690 dentate Americans, aged from 15 to 74 years old, the result showed that the rate of increase in the estimated incidence of periodontitis with age, throughout all age groups, is much higher among subjects with poor oral hygiene than among those with good oral hygiene. Oral hygiene was confirmed as the most important predictor for periodontitis in all age groups.

2.5 Theoretical framework

A risk factor is something that increases the individuals likelihood of getting diseases or conditions .It is possible to develop periodontal diseases with or without the risk factors which are listed below. However, the more risk factors the individual have ,the greater likelihood of developing periodontal diseases (Carson-Dewitt & AAP,2010).

According to the literature review, there are various factors that associate and effect the periodontal diseases, these factors can be divided into the following categories:

Lifestyle factors

- <u>Smoking</u>- smoking greatly increase the risk of developing the periodontal diseases among the populations all over the world. It is also greatly reduces the chance that treatments for periodontal disease will be effective.

- <u>Poor nutrition</u> - An un healthy diet (e.g. one that is high in fat and low in vit.c) can increase the chance of periodontal diseases.

- <u>Stress</u>- stress can hamper the body's ability to fight off the infection that prompts periodontal diseases.

Conditions

- <u>Diabetes.</u>

- <u>Hormonal changes</u> – such as hormonal changes which were happened in girls and women (puberty, pregnancy, menopause).

- <u>Autoimmune diseases</u> – like Down Syndrome

- <u>Age</u>- the risk of developing periodontal diseases increases as the age increases.

- 85% of adults aged 20-64 have periodontal diseases.

- 17% of adults aged 65 and over have periodontal diseases.

- <u>Gender</u> – women are more likely to than men to develop periodontal diseases, probably because of hormonal changes that women experience through their life cycle .

- <u>Genetic factors</u>-These seems to be a genetic tendency for certain people to develop periodontitis.

- <u>Race</u>- African Americans and people of Hispanic origin have a higher rate of periodontitis than do Caucasian Americans.

- <u>Poor oral hygiene</u>.

Fig 2.1: Illustrated the summarized modifiable and non-modifiable factors that are related with periodontal diseases

2.6 Summary of chapter two

The literatures have different indicators of periodontal diseases among different countries throughout the world. The review of literatures have also shown a multi factorial causal association of periodontal diseases includes the level of oral hygiene, socioeconomic status, dental visits, diabetes mellitus and nutrition. Oral health education on topics has also been shown to be an essential part in prevention and control of these periodontal diseases.

Available population–based periodontal diseases data originate from studies encompassing a wide range of objectives, designs and measurement criteria .The lack of standardized study design, definition of periodontal diseases status, method for disease detection and measurement, and criteria for subject selection markedly limit interpretation and analysis of available population –based periodontal diseases data around the world. However, several broad trends on the nature of human periodontal diseases are apparent across the wide range of population –based data (Kingman, et al, 2002).Another problem with many population –based periodontal studies has been the reliance upon measurement of probing depth as an indicator of disease status. At a population level, probing pocket depth measurement is of limited value for the appraisal of the extent and severity of periodontal diseases for the following reasons:

1. An increase in the probing depth at a given tooth site may or may not be associated with attachment loss at the site.

2. The probing pocket depth at a given site is a changeable measure .A reduction of the probing depth with aging due to gingival recession is frequently observed, and does not necessarily indicate improved periodontal status.

3. Probing depth does not provide an accurate measure of periodontal tissue destruction accumulated over a person's lifetime as reliably as assessment of periodontal attachment level (Loe, et al,1992).

Significant disparities appear to exist in the level of periodontitis among young ,adults and senior populations in the world .Subjects of African ethnicity seem to have the highest ,followed by Hispanic and Asians .Disparities in periodontal status appear to occur largely between the poor and the rich .Populations with a lower socioeconomic level cannot afford dental treatment. These populations often lack healthy attitudes and behaviors for oral health, as well as for systemic health .In addition, periodontal diseases susceptibility is further aggravated by the apparent occurrence in these populations of certain biological and microbiological risk factors that further increase their predisposition to periodontal diseases (Albandar &Rams,2002).

Epidemiologic data can form the basis for selection and implementation of strategies (population strategy, secondary prevention strategy, identification of high risk groups for periodontitis) to prevent and treat periodontal diseases. Three broad strategies have been advances (Sheiham, 1991; Rose, 1992):

1. *Population strategy*: uses a community –wide approach in which health education and other favorable life practices are introduced in the community, and unfavorable behaviors are attempted to be changed.

2. *Secondary prevention strategy* :includes detecting and treating individuals with destructive periodontal diseases .Basically ,health education is an integral part of this strategy, although it is more customized to the needs of the individual patient. Dental health education approaches to improve the oral hygiene of the individual patient ,Although successful in the short-term ,have been shown to be relatively ineffective in making sustained changes in oral hygiene behaviors (Sheiham &Netuveli,2002).This may be partly due to the failure to incorporate social contextual factors and other

factors, such as loss of function and esthetics, and the general health impact of periodontal diseases, in these programmes .

3. *Identification of high risk groups of periodontitis*: the early detection of active disease and identification of the subjects and groups who are more likely to develop destructive periodontal diseases in the future are important elements of dental care system planning.

The selection of the most appropriate of the above strategies for a given population group is dependent upon the disease distribution and nature of risk factors pertinent to periodontal diseases in that particular population.

CHAPTR THREE
Conceptual Framework

3.1 Introduction

The main aim of the present study was to assess periodontal diseases among Palestinian school students aged 15- years in Nablus city. According to the previous studies, there were several modifiable and non modifiable factors affecting the prevalence of periodontal diseases. Four modifiable factors were assessed, these are: oral hygiene level, smoking, socioeconomic status, and the type of diet (nutrition). This study includes the investigation of the relationships between these risk factors and periodontal diseases.

3.2.1 Definitions and identifications

According to American Academy of Periodontology (2010), "Periodontal disease is a serious public health issue that may have a significant impact on the overall wellness of the population. Periodontal disease is a chronic inflammatory disease (and could be acute inflammatory diseases) that affects the gum tissue and other structure which are supporting the teeth. If un treated, it can lead to tooth loss, and may also interfere with other systems of the body. Samuel &AAP (2010) said in their studies that periodontal diseases are bigger problems than we all thought.

Periodontal diseases have been defined as "a group of lesions affecting the tissues surrounding and supporting the teeth in their sockets", The majority of periodontal diseases can be classified as either gingivitis or periodontitis which occur as a result of the presence of bacterial plaque or calculus on supra-gingival or sub-gingival teeth surfaces. It is generally accepted that periodontal diseases being as gingivitis, which progresses, only in some individuals, to periodontitis (Carranza, 2006).

The word "periodontal" literally means "tissue around the tooth.

Periodontal diseases are the main chronic infectious diseases of the oral cavity which include groups of chronic inflammatory diseases. These affect the periodontal supporting tissue of teeth and encompass destructive and non-destructive diseases (Albandar, 2005).

Gingivitis: is the inflammation of the soft tissue without apical migration of the junctional epithelium; it is reversible, non destructive diseases that do not involve loss of periodontal tissue (Albandar, 2005).

Periodontitis: is the inflammation of the periodotium that is accompanied by apical migration of the junctional epithelium, leading to destruction of the connective tissue attachement and alveolar bone loss. Adult periodontitis is the most serious form of the periodontal diseases. It involves the gingiva, periodontal ligament, and alveolar bone.

Localized juvenile periodontitis: is a common form of periodontal disease and is seen mainly in young people. Primarily, localized juvenile periodontitis affects the molars and incisors (Albandar, 2005).

3.2.2 Classification of periodontal diseases

The American Dental Association (ADA) and the American Academy of Periodontology (AAP) have been developed systems for classifying periodontal diseases.

American Dental Association Classifications

The system which is developed by the ADA (1986) , is primarily based on the severity of attachment loss. The clinicians classify the patients into four Case Types as the followings:

Case Type I: Gingivitis

Case Type II: Early Periodontitis

Case Type III: Moderate Periodontitis

Case Type IV: Advanced Periodontitis

American Academy of Periodontology

The American Academy of Periodontology (AAP) classification system was established to identify distinct types of periodontal diseases.

The classification was taking into consideration the factors such as age of onset, clinical appearance, rate of disease progression, pathogenic microbial flora and

systemic influences. There are specific case types that were identified within each category of the gingivitis and periodontal diseases.

Gingivitis Subdivisions are listed below:

- Plaque-Associated Gingivitis
    - Chronic Gingivitis
    - Acute Necrotizing Ulcerative Gingivitis
    - Gingivitis Associated with Systemic Conditions or Medications
        - Hormone-Induced Gingival Inflammation
        - Drug-Influenced Gingivitis .
        - Linear Gingival Erythema (LGE)
- Gingival Manifestations of Systemic Diseases and Mucocutaneous Lesions
    - Bacterial, Viral or Fungal
    - Blood Dyscrasias (for example Acute Monocytic Leukemia)
    - Mucocutaneous Diseases (Lichen Planus, Cicatricial Pemphigoid)

3.3.1 Oral hygiene and periodontal diseases

Oral health is a vital component of overall health, which is contribute to each individual's well-being and quality of life of these individuals (Lewis, et al, 2009). Because oral hygiene is an important etiological factors that affects one's esthetics and communication, it has a strong biological, psychological, and social effects (Mitsea, et al, 2001). Baelum et al (2006) said that oral hygiene is a risk factor for a number of systemic conditions such as the periodontal diseases. Oral hygiene is considered to be the primary factor in the development of gingivitis (Hinrichs, 2002; Marsh, et al, 2003). Albandar (2002) & Nyvad (2003) said in their studies that the level of oral hygiene in a population is positively correlated with the prevalence and severity of periodontal diseases and not only correlated with prevalence of periodontal diseases. Oral hygiene status is very important information for establishing priorities and determining the type and quantity of prevention and treatment services which are required to treat these periodontal diseases, as well as the type of personnel who needed to provide these treatment needs (Rafael & Carmen, 2008).

Oral health is an important aspect of the whole health of all children (Lewis,et al,2009) . Bacterial dental plaque is considered to be the primary etiological factor in the development of gingivitis in children (Hinrichs, 2002; Marsh, et al, 2003). A number of studies have shown that challenges to oral health are more complex for those children who are often unable to adequately apply the techniques necessary to control plaque (Dinesh,et al,2003).The complexity in maintaining the optimal level of oral hygiene in the children because that a child's oral hygiene becomes the responsibility of another person, generally a parent or guardian (Kamatchy, et al,2003).

Teeth brushing may help to prevent some of oral health diseases which are considered as public health problems such as the chronic periodontal diseases and dental caries. Frequency of teeth brushing are associated to general oral health (Haugejorden,1996; Vanobberge, et al,2001; Levin&Currie,2010) and it is recommended that children must brush their teeth at least twice a day to reduce levels of teeth decay and gum diseases (Loe,2000; Scottish Executive,2002). In Kuwait (2003), Al-Nasari et al said in their study (34%) of the students were brushing twice a day or more often, (45%) once a day and (20%) less than once a day. Most of the students (70%) used fluoride toothpaste,(11%) did not use it and (20%) did not know whether they used the

fluoridated toothpaste or not. Teeth brushing programs may alleviate periodontal diseases. However, self adherence to teeth brushing regimens among children and adolescents varies markedly: a study of 32 countries in Europe and North America found that (16 to 80 percent) of boys practiced teeth brushing more than once daily, while girls reported better compliance (26 to 89 percent). Another multinational study (in 22 countries) reported similar results. Despite the importance of teeth brushing (with toothpaste) to dental practice, few studies have examined the clinical and non-clinical variables associated closely with oral hygiene practices among schoolchildren (Rafael & Carmen, 2008). According to study of (Samadzadeh & Hessari,1999) , (27%) of the study populations' who were aged 12 years old , had reported with no brushing ,and only half of them reported brushing their teeth once daily. Similarly, a high prevalence of dental plaque and calculus has been highlighted in other Asian countries (Corbet, et al, 2002).

The comparison of teeth cleaning methods and modes suggests that the promotion of cleaning the dentition with toothbrush and toothpaste will go a long way toward improving oral hygiene .In rural area of the world, the use of toothbrush and toothpaste is considered expensive and probably because of this reason, indigenous methods of cleaning the teeth are still used. However, the majority of those who use a toothbrush are unaware of proper brushing techniques. Other oral hygiene aids, such as dental floss, interdental cleaning aids, and mouthwashes, are not widely available and are rarely used (Haavio, 1995). Furthermore, a lack of knowledge about good oral hygiene practices among the parents, lack of motivation, the low priority given to oral health care in the society, and the generally poor socioeconomic status of parents or guardians may be other explanations of the poor level of oral hygiene among the children (Kendall, 1992). Micelle et al (2005) said that Australian children of low social class expressed low compliance with dental behaviors instructions .In contrast, Fuks, et al (1993) said that there is no association was found between social class, ethnic origin and the frequency of brushing. Similar findings were described by (Dummer, et al,1987; Warnakulasuirty & Silver ,1988). Saied-Moallemi, et al (2008) had conclude that twice-daily tooth-brushing behavior and sound dentition in 9-years-old were associated with their mothers' positive oral health-related attitudes. Thus, in developing oral health promotion programs for children and adolescents, a considerable potential of mothers should be a major focus of oral health professionals.

(Kressin, et al, 2003) found in their study that increased practice of preventive dental behaviors ,such as teeth brushing ,flossing ,and dental visits ,resulted in greater teeth retention. If this trends in increased teeth retention continue, individuals will lose fewer teeth as they aged but will have more teeth that are risk for oral diseases through their life .This increased retention of teeth highlights the need for dental public health professionals to reemphasize the importance of preventive dental behaviors. In order to help adults to maintain sound teeth, the American Dental Association recommended that individuals brush twice and floss at least once a day, and have regular prophylactic dental visits (American Dental Association,1998 &2002).

3.3.2 The effect of dentist visiting on the periodontal diseases

Oral diseases are clearly related to behaviors, and the prevalence of periodontal diseases has decreased with improvements in oral hygiene habits. This general trend in reducing periodontal diseases, however has not been seen in several developing countries or in the Middle East (Al-Nasari, et al, 2003). Personal oral hygiene routines are important at an individual level to maintain oral health, equally important are regular dental visits, as they provide professional diagnostic and prophylactic services that are essential to prevent periodontal diseases. The percentage of individuals who report having visited the dentist the preceding year varies between studies in different countries. As for gender, literature from several countries reported differences in oral health behavior between males and females. In some studies, females visited dentists and used oral hygiene tools more frequently than males, whereas other studies did not find such a gender difference. Various studies showed an association between the utilization of dental services and oral health (Faresi, 2010) .

In north Jordan (2006), Al-Omari et al said in their study that (80 %) of north Jordan school children visited the dentist only for emergencies and cost was found to the main barriers for regular dental attendance. In Kuwait (2003), Al-Nasari et al said in their study which is conducted to estimate the oral health knowledge and behaviors among male health sciences college students that most of these students (60%) had visited a dentist during the last year, (11%) had visited a dentist 1-2 years ago and (29%) had visited the dentist more than two years ago. More than half of the students were seeking the dentist for the treatment.

Dental visiting is still not considered a preventive dental behavior; at present it only depends on treatment needs. Thus people from the lower income group fail to make prophylactic visits to a dentist thus giving them poorer dental health behavior (Sanders ,et al,2006; Gundala & Chava, 2010). Faresi (2010) in her study explored the relationships between dental visit patterns and periodontal health in a representative sample of the young Saudi Arabian population. She found that the prevalence of periodontal diseases was significantly lower among subjects who were taught the right way to brush their teeth by the dentist. The highest occurrence of healthy periodontium (23.9%) and the lowest need for complex treatment (0%) were found among students who had annual reminders for check-ups. Faresi also pointed to the reasons for dental visits and association between these visits with CPITN. Pain and dental problems were the most common reason to visit the dentist, followed by random check-ups. The subjects who were reminded for the annual visit by their dentist had the highest occurrence of healthy periodontium (23.9%) and none needed complex oral treatment. In Faresi study, (60%) of individuals had visited the dentist in the previous year, (8.6%) had received regular check-ups and only (2.8%) were reminded of annual check-ups by the dentist.

In Sweden, (90%−95%) of all individuals visited the dentist on a regular basis every year or every other year, and about (70%−80%) of all adults were enrolled in a recall system of the dentist's initiatives (Hugoson,et al,2005). In USA, Dye and Selwitz reported that around (70%) of subjects had visited the dentist within the past 12 months (Dye & Selwitz, 2005). A study conducted in California found that (66%) visited the dentist in the preceding year; (41%) said that getting a regular check-up was their main reason for the last dental care visit, and this percentage was higher in females than males (Tomar, et al,1998).

A study in Michigan found a much higher percentage of regular visits, where (75%) of subjects reported to have a dental check-up at least once a year (Lang, et al ,1994). In Uganda only (21%−37%) of the population has ever visited a dentist (Kiwanuka ,et al,2004), (44%) received dental care in the past 2 years (Okullo, et al,2004). Similar studies reported that females use dental services more regularly than males (Behbehani & Shah, 2002; Al-Omari & Hamasha, 2005). No significant difference was found of the dental behaviors between males and females (Rajab, et al, 2002; Tseveenjav, et al, 2002).

Kazemnejad et al (2008) in their study on school students in Teheran, reported that periodontal diseases were more prevalent in students who referred to dentists only in emergency situations (OR = 1.82).

3.4.1 Smoking and periodontal diseases

Tobacco smoking is linked with many serious illnesses, such as cancer, cardio-pulmonary diseases, low birth weight, as well as with many health problems (Wald & Hackshaw, 1996). The remarkable British doctors' study showed that more than half of smokers die from their habit and half of these deaths occur in middle age . These figures also seem to apply to developing countries (Peto, et al, 1999; Doll, et al, 2004).

Tobacco smoking is also linked to a detrimental impact on oral health and these adverse effects of smoking on oral health are well (Haas, et al,1996,). In the dissemination of these facts to other health professionals and the public it might be appropriate to focus on adverse effects of smoking risk factors. These are including the substantially evidenced and have a significant global impact on the quality of life, in particular oral cancer and periodontal disease (Amarasena, et al, 2002; Shizukuishi, 2007).

Periodontal diseases, including gingivitis and periodontitis, are common human bacterial infections that affect the gingival and bone supporting the teeth. Gingivitis is a form of inflammation limited to the marginal gingival tissues, and is usually caused by the accumulation of dentogingival plaque due to inadequate oral hygiene. Gingivitis is a reversible disease and can be controlled with professional treatment and good oral care at home. Untreated gingivitis may advance to periodontitis under certain conditions when plaque accumulates below the gingival line. Periodontitis refers to the destructive inflammation those results in irreversible loss of periodontal attachment and teeth-supporting alveolar bone. Gingival recession may result from periodontal destruction and exposure of part of the root surfaces of teeth to the oral environment. The exposed root surfaces are at risk of developing root surface caries. Furthermore, root surface caries among individuals with gingival recession is more

prevalent among tobacco smokers than among non-smokers (Ravald, et al,1993; Beaglehole, et al,2005).

3.4.2 Effects of smoking on the prevalence and severity of periodontal diseases

Epidemiological studies have demonstrated that tobacco consumption is a significant risk factor for the development of periodontal diseases. Disease severity increases with frequency of smoking (Bergstrom, 1989; Haber & Kent, 1992; Amarasena, et al, 2002). Smokers accumulate more dental calculus than do non-smokes, and the quantity of calculus is correlated with the frequency of smoking (Bergstrom, 1999, Muller, et al, 2002; Shizukuishi, 2007). Smoking is also associated with an increased risk of periodontal attachment loss and formation of periodontal pockets, as well as alveolar bone loss (fig 3.1).The adverse effects of smoking on the periodontium correlates well with both the quantity of daily consumption and the duration (Martinez-Canut, et al, 1995; Machuca, et al, 2000). Approximately half of the cases of periodontitis in the United States have been attributed to smoking (Tomar & Asma, 2000). Smokers were recorded to have 2.5 to 3.5 times greater risk of severe periodontal attachment loss (Bergstrom, 1989). Analyses that adjusted for different oral hygiene habits , socioeconomic level, the smokers had deeper periodontal pockets ,increased alveolar bone loss, increased tooth mobility and more teeth loss than did non-smokers(Grossi & Zambon,1994).In addition ,emotional stress and poor oral hygiene seem to play an important interactive role with tobacco smoking(Horning & Cohen, 1995; Amarasena, et al,2002).

Young adult patients with acute necrotizing gingivitis have defective neurophil function, thereby allowing bacterial ,or possibly viral (cytomagalo-virus) invasion of gingival tissues (Slos & Contreras, 2000).The gingival bleeding in smokers is' less sever 'than in non- smokers, which could be related to the vasoconstructive effect of the nicotine. The main vasoconstructive property of nicotine exerts its effect at the end –arterial vasculature of gingival, and other tobacco components can also induce tissue necrosis and ulceration seen in the disease(Clark, et al,1981).

3.4.3 Effects of smoking on periodontal therapy outcomes

Smokers respond less favorably than non-smokers to non-surgical treatment (Prober, et al,1995; Grossi, et al,1996; Zee, 2009). Smokers exhibited less improvement when

compared with non smokers, in terms of pocket depth reduction, resolution of gingival inflammation, and clinical attachment level (Johnson, et al, 1994; Prober, et al,1995; Grossi, et al,1996). Heavy smokers (i.e. smoking >10 cigarettes per day) exhibited a lower degree of probing –depth reduction and less gain in clinical attachment level than did ex-smokers and non-smokers during active periodontal treatment (Kaldahl, et al, 1996; Nordery & Hugoson, 1998). In addition, current smokers have poor healing ability ,which may be associated with persistent subgingival infection, who compared with ex-smokers and non-smokers (Grossi, et al,1997).Cigarette smoking adversely affects outcomes of guided-tissue regeneration treatment (which aim to encourage regeneration of lost periodontal attachment)in terms of reduction in recession ,gain of clinical attachment and probing –bone, and root coverage (Trombelli & Scabbia,1997, Trombelli, et al, 1997).However, up to 90%of refractory periodontitis patients are smokers (Johnson & Slach, 2001). Because smokers have different treatment response patterns and healing dynamics, a short – term study by Jin et al (2000), suggested that smoking patients need a more intensive treatment regimen to achieve a better treatment outcome.

3.4.4 Effects of smoking cessation on periodontal tissues

Smoking cessation is beneficial to periodontal treatment outcomes and periodontal health .An encouraging finding is that periodontal disease progression also slows down in individuals who quit smoking .Smoking cessation may even restore the normal periodontal and microbial healing responses. The healing response of ex-smokers can even become similar to that of non-smokers (Kaldahl, et al, 1996; Grossi, et al, 1997; Johnson, 2004).Smokers who have been treated for periodontal diseases should be related more frequently for professional examination , reinforcement of oral hygiene instruction, intensive scaling, and prophylaxis after completion of treatment. Smoking is known to influence the composition of the subgingival microflora in adult patients with periodontitis ,and the habit may predispose to the development of a specific population of periodontal pathogens (Eggert, et al, 2001). Therefore, a combination of antibiotic therapy and participation in a smoking cessation programme may be the most effective treatment of smoking –induced periodontal diseases (Winkel, et al, 2001; van Winkellhoff, et al, 2001; Sham, et al, Aug 2003).

Fig 3.1: Effects of tobacco smoking on periodontal tissues

Tobacco smoking

Host defence
- ↓ PMN* function
- ↓ Ratio of CD4+/CD8+
- ↓ Salivary IgA, IgG†

Destruction of extracellular matrix and alveolar bone loss
- ↑ Pro-inflammatory cytokines and inflammatory mediators, eg IL-1‡, THF-α,§ and PGE₂∥
- ↑ MMPs¶

Compromise in wound healing

Connective tissue and vascular alterations
- ↓ Oxygen and nutrient supply
- ↓ Collagen synthesis

Periodontal disease progression and poor treatment response

* PMN	polymorphonuclear leukocytes
† IgA, IgG	immunoglobulin A, immunoglobulin G
‡ IL-1	interleukin-1
§ TNF-α	tumour necrosis factor–alpha
∥ PGE₂	prostaglandin E2
¶ MMPs	matrix metalloproteinases

3.5.1 Nutritional status and periodontal diseases

Periodontal diseases is an infection-mediated destruction of teeth supporting tissues (loss of attachment fibers and alveolar bone). It is clear that the pathogenesis of periodontitis involves anaerobic bacteria. The damage of tissues occur as a result of the complex interaction between pathogenic bacteria and the host's response to infection (Korman & Loe, 1993). It is also known that several local and systemic factors are associated with the risk of periodontal diseases or the severity of these diseases such as smoking ,diabetes mellitus, gender and stress (Brown, et al, 1994; Genco, 1996).It is also known that nutrition is important for maintaining periodontal health (Enwoun, 1995). However, the role of nutrients in modulating the pathogenesis of periodontal diseases is less well defined (Schifferle, 2009; Jain, et al, 2009) . It is evident that dietary intake of some sort of nutrients showed a weak, but statistically significant, relationship to periodontal disease (Nishida, et al, 2000). As periodontal diseases are bacterial infections of the gingival and alveolar bone, the therapy which decreasing the level of oral microorganisms can reduce gingivitis and stabilize periodontitis. Although dietary components play a major role in the pathogenesis of dental caries, the diet plays primarily a modifying role in the progression of periodontal disease. A periodontal diseases is essentially a wound, and sufficient host resources must be available for optimal healing to take place. The effect of nutrition on the immune system and its role in periodontal diseases has been recently reviewed (Enwonwu, 2002; Boyd, 2003; Schifferle, 2009). Neiva et al (2003) had concluded that although treatment of periodontal diseases with nutritional supplementation has minimal side effects, the data on its efficacy are limited.

3.5 .2 Nutrients and their effects on the periodontal diseases

Protein is the most common substances in the body after water, making up about 50%of the body's dry weight .Protein provides us with amino acids and some proteins are collagen, which is the major organic component of bones, teeth, periodontal ligaments and muscles. Proteins are needed to provide adequate host defenses. Proteins are components of defensive molecules and barriers that help to overcome the diseases. The periodontal defenses include cell-mediated immunity, antibody or humoral immunity. The epithelial cellular surface provides a major defensive barrier against the invasion by antigen, noxious products and bacteria (Schifferle, 2009).

Carbohydrates are the primary source of the energy in the human body. The major sources of these carbohydrates are sugars and starches; a dietary fiber is a complex carbohydrate with both soluble and insoluble forms. Diets with high fibers have been shown to lead the decrease in intestinal disorders and several forms of colon cancer. Oral health status can affect the ability to ingest adequate levels of high fiber foods. For example, in Mexico, patients with more than 21 teeth and those living in rural regions had a greater intake of fibers than those living in urban areas that had fewer than 21 teeth (Borges, et al, 2004).

Lipids are more concentrated source of energy than carbohydrates or proteins. Lipids provide us with fatty acids which are in turn having anti-inflammatory properties. The addition of these lipids (fatty acids) to our diet may help to reduce and modulate the inflammation associated with periodontal diseases (Kesavalu,et al,2006; Kesavalu, et al,2007).Body mass index was positively related to the severity of periodontal attachment loss. Overweight individuals (body mass index >27) with high level of insulin resistance exhibited an odds ratio of 1.48 for sever periodontal diseases by comparison with overweight subjects who had a low insulin resistance (Genco ,et al, 2005).

Vitamins are organic substances that are present in food in small quantities. They are utilized in metabolic reactions in the body.Vit.A is a fat –soluble , it is needed for the maturation of epithelial tissues of the periodontium .The excess of vit.A consumption can lead to gingival pathology (de Menezes, et al,1984). Vitamin.D can be considered as a conditional vitamin as it can be obtained from the diet and can be synthesized in the body as a result of adequate exposure to sunlight. Vit.D in the human body has multiple functions as it is needed to maintain blood calcium levels and the metabolism of osseous tissues.Vit.D also enhances the absorption of calcium from the intestines. If the levels of blood calcium are inadequate, there will be inadequate calcification of the osseous tissues which resulting rickets or osteomalacia. Low serum levels of vitamin D have been linked with a loss of periodontal attachment. It was concluded that the increased risk for periodontal diseases may be attributable to low levels of vit.D, which could reduce bone minerals density or have an immunomodulatory effect (Dietrich, et al, 2005). Vit.C : Collagen is a major component of the periodontium ,being one of the major proteins present in the gingival connective tissues and bone.

For collagen maturation to occur, adequate vitamin C must be available within the body to permit the hydroxylation of lysine and proline (Schifferle, 2009). Nishida et al (2000), in the NHANESIII, evaluated the effects of dietary intake of vit.c and the presence of periodontal diseases. The authors reported that the dietary intake of vitamin C showed a weak, but statistically significant, relationship with periodontal diseases in current and former smokers. In a later analysis, Chapple et al (2007) reviewed the data of 11,480 adult participants (<20 years of age) in the NHANESIII. The authors demonstrated that increased serum concentration of vit.C was associated with a reduced relative risk of periodontitis in both smokers and non-smokers.

Folic acid, which belongs to the vitamin B group, is generally known as a hemocytopoietic vitamin. It has been reported that a low serum folate level is associated with periodontal diseases in non-institutionalized older adults (Yu,et al,2007). The study by Erdemir & Bergstrom (2006) investigated the relationship between cigarette smoking and serum levels of folic acid in patients with periodontal diseases. They found that serum folic acid concentration was significantly lower in smokers with more periodontal destruction than in non-smokers with less periodontal destruction. Esaki et al (2010) found in their study to assess the relationship between dietary folate levels and gingival bleeding in non-smoking adult in Japan. Pearson's correlation coefficient showed a significant negative correlation between dietary folate level and bleeding on pobing. The negative association between folate level and bleeding on probing remained statistically significant in multiple regression analysis. In this study, there was no correlation was found between CPI and folic acid deficiency.

3.6 Socioeconomic status effects on periodontal diseases

Many diseases demonstrate a strong relationship with socioeconomic status (SES) for example the higher levels of SES experienced better health. Polk et al (2010) reported that social factors are   "critical determinants of health "and emphasized the importance of including them in planning interventions. Dummer (1987) reported that socioeconomic factors have been identified as predisposing risk factor in the development of periodontal diseases. Low income and poor education have been reported to influence periodontal status and the social class was found to affect both

plaque deposits and gingival health of the population. Dafi (1996) stated that the variations in periodontal condition in various socioeconomic groups are usually explained by differences in dental habits and oral hygiene practices.

The effects of inequalities of SES on the health and oral health –behaviors have been documented in Scotland (Levin&Currie; 2009; Levine al, 2009) and elsewhere (Locker, 2000; Maes, et al, 2006).The relationship between the family structure and oral health, had resulted in mixed findings. While Maes et al (2006) found weak or no significant association between family structure and oral health behaviors in most countries, Mattilaet al(2000) ; Pau et al (2007) found significant relationship between family structure and children and adolescent oral health outcomes.

Alexandrina et al (2010) reported that the relationship of periodontal diseases with SES can be viewed globally, when wide variation in SES among different populations are compared. The studies of comparing population from developing countries with those from industrialized countries suggested that periodontal diseases associated with nutritional deficiencies were seen in the developing countries .When data from high and middle income countries were compared with that from the low income grouping ,an obvious finding was much higher percentage of subjects with healthy periodontal diseases in the young age group counted (30% vs. 0-7%). It was also shown that it is difficult to assess periodontal conditions in low socioeconomic population. Adults who come from such background are often preoccupied with other needs and perceived dental care and oral health as low priority.

Gundala & Chava (2010) in their study have found a significant decrease in periodontitis as the level of income and level of education are increased .

In Al-Sudan, Ibraheim (2010) in his study of 15-years old students which were randomly selected from boys and girls secondary schools , found that the number of teeth brushing per day and the SES and gender were associated with prevalence of periodontal diseases. Attendance of children to dental clinics, numbers of tooth brushing per day were found to be related to SES. He conclude that Students from higher social class (38% from the sample) showed better periodontal conditions (periodontal diseases=11.5% from the study sample), attending dental clinics (13.9%

from the study sample) and brushing their teeth (20.6% from the study sample) more than students from other classes.

3.7 Operational definitions

1- Oral hygiene concept in this study refers to the care of the teeth and gums which is usually performed regularly at home, which is including all the oral health habits and activities that promote good health of the mouth (such as frequency of tooth brushing and flossing, time of teeth brushing, preventive dental visits and other aspects of care that may have influenced the student's periodontal condition).

- Brushing as quality and quantity activity that performed with a toothbrush.

- Flossing which means using the dental floss as adjunctive to brushing to reach the optimal oral hygiene level, and how these students are using the dental floss.

- Dental clinic visits: how many the participant in this study have had attend the dental clinic annually, and why the participant attend the dental clinic? If they seek to scaling and polishing their teeth only?

Oral hygiene index (SOHI) was measured in this study for each participant also in order to calculate Oral Hygiene Index scores; in turn we will estimate oral hygiene level more accurately among students aged 15- years in Nablus city.

2-Smoking concept refers to the active smoking of tobacco products which including manufactured and hand- rolled cigarettes. The participant was considered as smoker if he\she had smoke tobacco products in the past. Also the participant was considered as smoker if he\she has smoke in the time of the present study. Age of the participant at which the participants begin to smoke and the number of the cigarettes per week which were consumed by the participant was considered in the statistical analysis in relation to the disease which was under study (periodontal diseases in 15 years old students). Smoking concept in this research also include the active smoking of water pipe (Nargilla). Smoking concept does not include the smoking of any other substances, e.g.: herbal cigarettes, marijuana and home grown tobacco. The

consumption of tobacco products by other means, such as chewing, is also excluded from the research.

3- Socioeconomic status (SES) in this study refers to student's socioeconomic status which is based on:

- Parents' educational level; which have been classified into:

1. High which refers to university level of education of the participants' parents?

2. Middle which refers to level of education after the secondary stage but not a university level.

3. Low which refers to the secondary level of education?

- Parental occupation status;

- The numbers of the sisters and brothers which are living with the participants;

- Who live with the participants? his\her mother? or his\her father? Or the both parents;

-The economic status of the participant according to the participant opinion;

4. Nutrition concept in this study refers nutritional habits of the participants which were estimated by using Food Frequency Questionnaire .In this study the participants were given a list of food items to indicate his or her intake frequency and quantity per week. In this study the participants were asked about how many times that the participants had had their breakfast per week. Also the participants were asked about the frequency of eating (fruits, vegetables, meat, and milk).

CHAPTER FOUR

Study methodology

4.1 Introduction

The present study involves a research on the periodontal diseases prevalence in Nablus City. This chapter included the description of the study area, study population, study design, study tools, and the sampling method is also described.

4.2 The description of socio-demographic and geographic area

Nablus is a Palestinian city in the north of the West Bank. Located in a strategic valley position between the two Mount Ebal & Mount Gerizim, which is about 63 Km. north of Jerusalem. It is the capital of the Nablus Governorate and a Palestinian commercial and cultural center (PCBS, 2007).

According to the population statistics estimated by the PCBS (2007), the end total population at 2007 was around 320,830 individuals in Nablus, this was included the populations of four refugee camps in Nablus area. Sex ratio (male per 100 female) was 102,3. Nablus District has a very young population with approximately 40% (125,572) of the population is under 14 years of age.

4.3 Study population

The target population was decided to be the male and female students of the 9th grade classes of governmental and private schools, whose ages 15 years old in Nablus city.

4.4 Study design

A cross –sectional design was chosen to meet the objectives of the present study. This was applied to identify the prevalence of periodontal diseases in Nablus city and to investigate the risk factors of these periodontal diseases. The data and the information were collected from the schools' students in their schools. The study was conducted through the period from 15/11/2010 to 30/12/2010.

4.5 Sample techniques

The researcher has chosen the students of the age 15 years old for the present study. This age represent a group of the global monitoring age for periodontal diseases. Also this age can be used for the international comparisons and monitoring of the periodontal diseases trends (WHO, 1987, 2005).

The multistage sampling techniques were used in this study to obtain a representative sample. Simple random sampling technique was used to select the schools for this study. Clustered sampling technique was used to select the students' classes in order to collect information from these students. The data and the information were taken by the researcher himself through clinical examination of these students using WHO criteria for CPITN and SOHI. All students were interviewed to fill the pre-prepared questionnaires via simple random cluster sampling. The questionnaire is attached at the end of the present thesis (see appendix 1).

4.6 The Sampling processes

The number of the students in the 9th grade in Nablus city were reviewed and obtained from the recorded files of the educational directorate of Nablus city. The obtained statistical data illustrated that the adopted students numbers of the 2823 (males and females) were in the 9th grade at year 2010; these students were distributed in 36 schools. The sample of the students were determined and constructed, and a random representative of 15% of the students were chosen for this study. Thus the examined students sample was comprise of 424 students (males & females).

Never the less the classified categories of the adopted students are presented in the table 4.1

Table 4.1: illustrates the numbers of the adopted students for the present study

Study Population		
sex	School type	
	Private sector	Governmental sector
males	120	1220
females	181	1302
Total	301	2522
totals Sum the	2823	
Study sample (15% from the study population)		
sex	School type	
	Private schools	Governmental schools
males	18	183
females	27	196
Total	45	379
totals Sum the	424	

4.7 The Tools and Equipments

4.7.1 Description of the interview and questionnaire

The questionnaire was arranged in regarding to resolve the main goals of the present study. The questionnaire was practically filled directly by interviewing each student separately. The questionnaire was selected from previous studies. The questionnaires were completed in the pre-determined schools. No one of the participant had return the questionnaire or reject the clinical examination giving the response rate of 100%.

4.7.2 The components of the questionnaire

Part 1: student background

1.Scool type (governmental school or private school)?

2. School system (mixed or separated schools) ?

3.Gender?

Part 2: student's family background

1. Who live with interviewed student in the same house ?

2. How many sons and sisters are live in the interviewed student's house ?

3. Is student's father works?

4. Is student's mother works?

5. What is the educational level of the parents of each student?

6. What is the economic situation of the student's family (according the opinion of the interviewed student?

Part 3: oral hygiene habits

1.Is the interviewed student clean her\his teeth , usually?

2. How many times the interviewed student clean his \her teeth daily?

3. When the interviewed student clean his \her teeth ?

4. How many times the interviewed student used the dental floss as teeth cleaning adjunctive?

5. Was the interviewed student visiting the dentist regularly?

6. What was the main reason for the interviewed student to visit the dentist ?

7. When the interviewed student had visit the dentist last time?

Part 4 : nutritional habits

1. Weekly how many the interviewed student take his\her breakfast (more than cup of tea or tea or fruit juice) ?

2. Weekly what is the frequency of the interviewed student eat or drink fruit ,vegetables ,sweets ,cola ,milk ,meat ?

3. What were the activities that the interviewed student do to monitoring his\her weight?

Part 5: smoking habits

1. In the past, was the interviewed student have smoke cigarettes (as minimum one cigarette?

2. How many times that the interviewed students smoke cigarettes?

3. At what age the interviewed student began to smoke?

4. How many cigarettes the interviewed students smoke weekly?

5.Was the interviewed student smoked nargilla ?

6. How many times the interviewed student smoke nargilla ?

4.7.3 Piloting

The piloting is useful in the time consumptions of the questionnaire and adequacy of the responses. The data collecting tool was examined via pilot testing on 10% of the 424 students. A total of 42 students who were belonging to four schools in the area under study were interviewed to fill the questionnaire. No questions were added or omitted from the original questionnaire. These questionnaires did not included in the data analysis because these just a testing trial for the questionnaire.

4.8 Data collection

Nine schools were included in this study, 7 were governmental schools and 2 were private (see appendix 6). The questionnaire filling and the clinical examination were conducted at the same day. Schedule for data collection was pre-prepared. An average number of 25-30 students were examined per day .The criteria and the methods that described by WHO (1997,2005) were followed in this study to assess the gingiva and dental surfaces. The Community Periodontal Index for Treatment needs (CPITN) was

applied to measure the gingival conditions. The conditions recorded included CPITN scores which are: 0= (healthy),1= (gingival bleeding) and 2= (calculus). The periodontal pockets were excluded because that the concerned survey students were of the age of 15 years old. In such an age the periodontal pockets would be overestimated because of false pockets in this age (WHO, 2005).

The calibration of the clinical examiner was done through duplicate gingival examinations of students aged 15 which were not included in the final analysis (n =42). The intra-examiner agreement with regards to the gingival diagnosis was expressed in the percentage agreement of the Kappa statistics as recommended by the WHO (2005). Kappa statistics at the level 0.88 - 0.91 were achieved.

The clinical examinations were carried out in daylight using a plane mouth mirror. The CPITN probe was used for assessment of gingival conditions (WHO, 1997).

The purpose of the study and the examinations were explained to each student prior the investigations. The above processes were efficiently planned and arranged for the best care of the examined students. Each student was seated on a suitable chair with the examiner standing behind the chair to get a thorough examination of the oral cavity .Sterilized instruments were placed within the easy reach for the examiner. The recording assistant was seated close enough to the examiner, so the instructions and scores could easily heard and the examiner could see that findings were being recorded correctly. Oral hygiene status was examined by using explorer and plane mouth mirror. All the dental examinations were carried out by the same researcher.

4.8.1 The Oral Hygiene Index-Simplified (OHI-S)

Oral hygiene index was introduced by John C.Greene and Jack R.Vermillion in 1960).This index was modified and later called oral hygiene index-Simplified 1964), and recently this index have been used in many studies (Lin,et al,2001; Abe,et al,2006).

The OHI-S has two components: Debris index and Calculus index.

There are six indexed teeth selected with one surface each to be examined for both the components.

Index Teeth:

16   -   Upper right first molar   - buccal.

11   -   Upper right central incisor   - labial.

26   -   Upper left first molar   -buccal.

36   -   Lower left first molar   - lingual.

31   - Lower left central incisor   -labial .

46   - Lower right first molar   -lingual.

Criteria for recording

1- Only fully erupted permanent teeth are scored.

2- Natural teeth with full crown restorations and surfaces reduced in height by caries or trauma are not scored. In this case 2nd or 3rd molars are scored and in anterior region the central incisor on the opposite side of the midline is substituted.

Simplified Debris Index

The surface area covered by debris is estimated by running the side of an explorer (SHEPARDS CROOK) along the tooth surface being examined.

Scoring System

O. No debris or stains present.

   1. Soft debris covering with no more than 1\3rd of the tooth surface being examined or the presence of extrinsic stains without debris regardless of surface area covered.

2. Soft debris covering more than 1\3rd but not more than 2\3rd of the exposed tooth surface.

3. Soft debris covering more than2\3 rd of the exposed surface.

Simplified calculus Index: Scoring System

0 .No calculus.

1 .Supragingival calculus covering not more than 1\3rd of the exposed tooth surface being examined .

2 .Supragingival calculus covering more than 1\3rd but not more than 2\3rd of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth.

3 .Supragingival calculus covering more than 2\3rd of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth.

Calculation of the Index

For each individual, the scored debris were summed together then divided by the number of the scored surfaces.

4.9 The used sterilized instruments and equipments.

1. Plane mouth mirrors.

2. Community Periodontal Index Probes.

3. Explorer.

4. Tweezers.

5. Bowels.

6. Kidney tray.

7. Cotton holder.

8. Disposable mouth masks.

9. Disposable gloves.

10. Cotton and gauze pieces.

After each day of examination all the instruments were autoclaved. At the end of the day of the examinations, the main results of the clinical findings were reported to the classes' teachers and students.

4.10 Data analysis

The statistical analysis was made for the obtained data by using Statistical Package for Social Sciences (SPSS). The researcher analyzed the data after several consultations

with supervisor. Statistical analysis was conducted to explore the potential relationships between dependant and independent variables. The Chi-Square test has been used to check for the significance of the association and $P< 0.05$ was regarded as significant.

4.11 Ethical considerations

The ethical approval to carry out the present study was obtained from the directorate departments and the Ministry of Education. The concerned schools also were informed in advance and their agreements were obtained. All interviewed students in the selected schools which were randomly selected for this study, were informed about the purpose of this study and what their participation entail. The participant assured that they can withdraw from the study at any time and their participation is voluntary and their names and all gathered information would be confidential. This study was free from any coercion or any physical, psychosocial, social or economic injuries or threat of harm.

4.12 The reliability of the instrument

The reliability of the used instrument was tested by using the Cronbach's Alfa equation to assure their internal consistency .The tested results were as followed:

No. of Cases = 424, Reliability Coefficients = 47 Items, Alfa = 0.967

From the value of Alfa = 0.967 which its range should be between 0 to 1 to represent the internal reliability of a (multi- point formatted questionnaire) instrument. This value 0.967 is considered to be excellent and indicates to a good level for the homogeneity among all items. Also to ensure better reliability of each dimension, the researcher calculated the alpha coefficient for each dimension separately as follows:

Table 4.2: The values of Cronbach's Alfa of each dimension

The dimensions	Cronbach's Alfa value
part 1: family	0.972
part 2: oral hygiene habits	0.915
part 3: nutritional habits	0.948
part 4 : smoking habits	0.932
Total value	0.967

From this table it is clear that the resulted values for Cronbach's Alfa were between the ranges of 0.915 – 0.972.This indicating the consistency of the dimensions for the internal reliability for the present study with high ability data to reflect the sample results to all study population.

4.13 The limitations of the present study

For the present study there were three main limitations:

1. The studied area was limited to the schools of Nablus city.

2. The research study was limited only for six weeks that occurred between 15 of November to 30 of December.

3. The studied ages of the students were limited to 15 years old of the 9th grade class.

4. The present research study was depending on self funding of the researcher.

Other limitations because of the cross-sectional design of the study, causal relationships between dependant and independant variables cannot be established. Only, representatives' teeth, not all teeth present, were examined clinically. Therefore, it is possible that bleeding tendency was overestimated or underestimated.

CHAPTER FIVE

The Results

5.1 Introduction

This chapter presents the results with their statistical analysis. Descriptive analysis of the respondents in the studied schools and the factors which affected the status of the periodontal diseases were recorded. The relationships between the selected variables and CPITN were explored by using different analytical tests.

5.2 Presentations of the Results

The obtained data were prepared and arranged for the statistical analysis through SPSS.

5.3 The Sample Characteristics

5.3.1 Demographic Data:

1. Age

The adopted age of the students' sample for the present study was the age of 15-years old.

2. Gender

Table 5.1: illustrates the schools type, no. of the sampled students and their percentages

Schools' type	No.	Percentages%
Governmental	379	% 89.4
Private	45	% 10.6
Total	424	% 100.0

As shown in Table (5.1), 379 students were randomly selected from seven governmental schools (89% from the study sample) and 45 students were selected from two private schools (10.6% from the study sample) (see fig 5.1 in appendix 3).

Table 5.2: illustrates the gender of the sampled students, their numbers and their percentages

Sex	No.	Percentages%
Male	201	47.4
Female	223	52.6
Totals	424	100

As shown in Table (5.2), the total numbers of male students were 201 (47.4% from the study sample) and the numbers of female students were 232 (52.6% from the study sample) (see fig 5.2 in appendix 3).

5.3.2 The students Houses living status

Table 5.3: illustrate the ratios percentage of the students sample with their house participants living

No.	House living status	Percentages%
1	With Mothers	5.9
2	With Fathers	1.2
3	With both parents	92.2
4	In other house	0.7

1.Table 5.3 shows that the highest ratio percentage (92.2%) of the participants were living in the same house with their mothers and fathers, (5.9%) were living with their mothers only, (1.2%) were living with their fathers only, and (0.7%) only were living in other house.

Table 5.4: illustrate the ratios percentage of the participants individuals with the sample students of the study

No.	The no. of brothers and sisters	Percentages%
1	Alone	1.9
2	Only one sister / brother	6.4
3	Two sisters / brothers	16.7
4	Three sisters / brothers	23.6
5	Four sisters / brothers	25.0
6	Five sisters/ brothers or more	26.4

2. From the Table (5.4) , it can be seen that most of participants have five brothers and sisters or more with ratio of (26.4%), followed by participants who had four

brothers and sisters with ratio of (25%). Participants who had three brothers and sisters comprise a ratio of (23.6%). The lowest ratio was for participants who didn't have brothers or sisters with (1.9%).

Table 5.5: illustrates the working engagements ratios percentage of the participants' parents

No.	The Fathers		The Mothers	
	Working status	Percentages%	Working status	Percentages%
1	Yes	87.3	Yes	16.0
2	No, But searching	7.1	No, But searching	82.8
3	The participants didn't see their fathers at all	4.7	The participants didn't see their mothers at all	0.7

3. Table (5.5) showed that (87.3%) of participants' fathers were engaged with work, while only (7.1%) of them were with no work. The participants' mothers who were engaged with work (16.0%), while the higher ratios (82.8%) were with no work. Little ratios (4.7%, 0.7%) did not meet their parents.

Table 5.6: illustrate the ratios percentage of the educational level of the participants' parents

No.	The Fathers		The Mothers	
	Educational level	Percentages%	Educational level	Percentages%
1	Less than High School	42.7	Less than High School	39.2
2	High School	27.6	High School	21.0
3	Less than BSc	6.2	Less than BSc	5.9
4	BCs level	23.5	BCs level	33.9

4. From Table (5.6) ,it can observed that the ratios percentage of the educational levels of the participants' fathers were (23.5%) for the BCs degree, (27.6%) for the

high school degree and (42.7%) for the degrees which less than the high schools. Also it can be seen that the ratios percentage of educational levels of the same participants' mothers were (33.9%) for the BSc degree, (21.0%) for the high school degree and (39.2) for the degrees which less than the high schools.

Table 5.7: shows ratios percentage of the economic status of the participants' families

No.	Economic status	Percentages%
1	Very Good	27.6
2	Good	22.9
3	Moderate	42.2
4	Weak	7.3

5. From Table (5.7), it can be seen that the ratios percentage of the participants' families economic status were (27.6%) for the 'Very Good' level, (22.9%) for the 'Good' level, (42.2%) for the 'Moderate' level and only (7.3%) for the' weak' level (see fig 5.7 in appendix 4).

5.3.3 Oral hygiene habits:

Table 5.8: shows the ratios percentage of teeth brushing per day for the participant students

No.	Teeth brushing /daily		Percentages%
1		NO	27.4
2	YES	One time	41.7
		Two Times	23.6
		More Than Two Times	7.3

1. From Table (5.8) , it can be notice that the ratios percentage of the daily brushing by the participant students were (41.7%) for the once daily habit, (23.6%) for the twice daily habit , (7.3%) for the habits of more than twice daily and (27.4%) for those who use not to brush their teeth at all.

Table 5.9: shows the ratios percentage of the participants' students according to fixed time and the length of period (mins) of their teeth brushing

No.	Time of brushing		Durations of brushing in mins.	
	Time	Percentages%	duration	Percentages%
1	In the morning	46.0	Less than a minute	22.2
2	After lunch	15.3	Two minutes	19.8
3	Before got to sleep	45.3	More than two minutes	11.6
4	Others	5.2	I don't know	19.1

2. From Table (5.9), it can be seen that the ratios percentage of the participants for their teeth brushing were (46.0%) for the morning time,(15.3%) for the after lunch

time ,(45.3%) for those who brushing just before the evening bed time and (5.2%) for those who brushing at different times.

The ratios percentage of the same participants of their duration (mins.) were (22.2%) for those who use to brush for less than a minute,(19.8%) for those who used to brush their teeth for about two minutes,(11.6%) for those who used to brush their teeth for a little longer time than two minutes and (19.1%) for the other participants who did not know the time of their brushing.

Table 5.10: shows the ratios percentage of the participant students according to their dental floss use

No.	Dental floss using frequency	Percentage%
1	Once daily or less	6.8
2	More than once daily	6.1
3	No using the dental floss	87.0

3. From Table (5.10) ,it can notice that the ratios percentage of the participants dental use of the floss were (6.8%) for those who used the dental floss once daily or less, (6.1%) for those who used the dental floss for more than once daily and (87%) for those participants who never used the dental floss.

Table 5.11: shows the ratios percentage of the participant students according to their dentist visiting's

No.	Dentist visit		Percentages%
1		No	24.5
2	Yes	Regular visit(6-12 month)	8.7
		Some times	10.1
		Pain	56.6

4. From Table (5.11) , it can be seen that the ratios percentage of the participant students were (24.5%) for those who never visited any dentist, (8.7)5 for those who were use to visit the dentist regularly during 6- 12 months each time, (10.1%) for those who visited the dentist for sometimes and (56.6%) for the participants who visited the dentist only during the teeth ache.

Table5.12: illustrates the ratios percentage of the participant students according to the time of the last visit or the reason of their visit to the dentist

No.	Last dental visit		Reason of the dental visit	
	Time	Percentages%	The reason	Percentage%
1	Before less than 6 months	38.2	teeth ache	64.4
2	Before 6-12 months	13.7	peer advice	0.7
3	Befor13-24 months	14.4	Dentist recommendation	0.9
4	Before 25- 60 months	6.6	Dental Check up	6.8
5	Before more the 60 month	2.6	Dental and periodontal cleaning	2.6

5. From Table (5.12), it can be notice that the ratios percentage of the participant students were (38.2%) for those who have their visit were occurred before 6 months of time, (13.7%) for those who have their visit were occurred during the last 6-12 months ago,(14.4%) for those who have their visit were occurred during the last 13-24 months ago, (6.6%) for those who have their visit were occurred during the last 25-60 months ago and (2.6%) for the participants who have their visit were occurred during the last 60 or more months ago.

The table also shows that the ratios percentage of the same participant students were (64.4%) for those who suffered from teeth ache, (0.7%) for those who obeyed the peer advice, (0.9%) f or those who obeyed the dentist recommendation, (6.8%) for those who visited the dentist just for check-up reason and (2.6%) of the participants who visited the dentist for dental and periodontal cleaning reasons.

5.3.4 Nutrition and food eating habits:

Table 5.13: shows the ratios percentage of the participant student according to the daily/case of taking their breakfast and during the weekend

No.	In routine days		In the weekend	
	The variables	Percentages%	The variables	Percentages%
1	Didn't take a breakfast in routine days	9.9	Didn't take a breakfast in week ends	9.1
2	Only in one day	3.5		
3	In two days	9.7	Once week in the week end	12.4
4	In three days	5.0		
5	In four days	2.8	Twice weekly in weekends	78.5
6	In five days	8.5		
7	In seven days	60.6		

1. From Table (5.13) ,it can be seen that the ratios percentage of the participant students were (9.9%) for those who used not to take their breakfast,(2.8%)-(8.5%) for those who take their breakfast once to five days regularly and (60.6%) for the participants who used to take their breakfast daily during the week.

The Table also shows that the ratios percentage of the same participants were (9.1%) for those who use not to take any breakfast in the weekends, (12.4%) for those who take the breakfast only once in the weekend and (78.5%) for the participant students who used to take the breakfast twice in the weekend.

Table 5.14: shows the ratios percentage of the participant students in relation to their nutritional intake

Food types	I didn't eat	Less than once weekly	Once weekly	From 2-4 times per week	6 times per week	Once daily	More than once daily
Fruits	% 5.7	% 4.5	% 6.2	% 25.0	% 6.6	% 22.6	% 29.4
Vegetables	% 5.4	% 6.6	% 5.0	% 25.6	% 8.5	% 25.0	% 23.9
Sweets	% 5.0	% 8.0	% 9.0	% 21.0	% 5.4	% 22.6	% 29.0
soft drinks	% 5.4	% 13.2	% 6.4	% 27.5	% 5.8	% 21.9	% 19.8
Milk	% 44.3	% 12.5	% 5.9	% 10.6	% 2.9	% 18.4	% 5.4
Meats	% 5.7	% 5.4	% 8.2	% 58.3	% 5.2	% 13.0	% 4.2
Water	% 0.0	% 0.0	% 0.0	% 1.4	% 3.1	% 1.8	% 93.7

2. From Table (5.14) ,it can be notice that the ratios percentage of the participant students for the fruits intake were the highest (29.4%) for those who eat more than once daily and the lowest (4.5%) for those who eat less than once daily. The vegetable intake was the highest (25.6%) for those who consume two to four times weekly and the lowest (5.0%) were for those who consume once weekly. In relation to the sweets the highest ratio (29.0%) was for those who eat sweets more than once daily and the lowest ratio (5.0%) for those who did not eat sweets at all. In relation to their cola and other soft drink, the higher ratio was for those who drink once daily and the lowest ratio (5.4%) for those who do not have such drinks. In relation to their milk drinking the highest ratio (44.3%) was for those who used not to drink ay milk and the lowest ratio between (2.9%) was for those who use to drink milk six times weekly. In their to ham or chicken meat eating, the highest ratio (58.3%) was for those who consume meat two to four times weekly, and the lowest ratio (4.20%) was for those who

consume meat more than once daily. In relation to their water drinking the highest ratio (93.7%) was for those who drink water more than once daily.

Table 5.15: indicates the ratios percentage of the participant students of their preferences for the nutritional habits which related to their body obesity regulation

No.	The activities	Students no.	Percentages%
1	Physical Activities	265	62.5
2	Generally, having less food	116	27.4
3	eating less Sweets	131	30.9
4	Less Fat Meals	122	28.8
5	More Vegetables and Fruits	116	27.4
6	Less Soft Drinks with Sugar	78	18.4
7	Having more Water	147	34.7
8	Restriction to a specific type of food	44	10.4
9	Followed supervised diet regime	18	4.2
10	Limitation to a certain number of meals	100	23.6
11	Fasting for no religious purpose	23	5.4
12	Vomiting	33	7.8
13	Laxatives or weigh Loss Tablets	14	3.3
14	Smokes more	11	2.6

3. From Table (5.15) , it can be observe that the highest ratio percentage (62.5%) was for those participants who followed the exercise physical activities to keep on regulating their weights. Another ratio percentage (34.7%) was for those participants who prefer to drink water to reduce their appetite in order to keep on regulating their

weights. Another ratio percentage (30.9%) was for those participants who prefer to reduce eating the sweets in order to keep on regulating their weights. Another little ratio percentage (5.4%) was for those participants who preferred fasting in order to keep on regulating their weights.

5.3.5 The Smoking Habits:

Table 5.16: illustrates the ratios percentage of the participant students related to their smoking habits

No.	Smoking habit	Percentages%
1	no	85.8
2	yes	14.2

1.From Table (5.16) , it can be seen that only (14.2%) of the participant students was smoking cigarettes at a minimum of one time in their life.

Table 5.17: distribution of the participants according to the smoking habit frequency

No.	Smoking frequency	Percentages%
1	daily	1.9
2	Not in a daily form but, as min. once weekly	38.9
3	Less than one time in the week	4.5
4	Not smoke	54.7

2.Table (5.17) shows the ratios percentage of the participant smokers (14.2%) according to their smoking frequency per fixed time (day or week).a ratio of (1.9%) was for those who use to smoke cigarette daily ,a ratio (38.9%) was for those who smoke once weekly and the ratio of (4.5%) was for those who use to smoke cigarettes less than once weekly.

Table 5.18: shows the ages of the participant students when they were started smoking and the number of cigarettes which they smoke per fixed time (day)

Age (years)	Percentages%	Cigarettes number	Percentages%
11	12.0	Less than one	36.6
12	9.0		
13	3.8	1-7	7.3
14	10.1	14-21	0.5
15	10.4	35 or more	0.9

3. From Table (5.18), it can be notice that the ratios percentage of the participant students according to their ages of starting to smoke were (12%) for those of the 11 years old , (9%) for those of the 12 years old ,(3.8 %) for those of 13 years old ,(10.1%) for those of 14 years old and (10.4%) for those participants of the 15 years old.

The Table also shows that the ratio percentage of the same participants related to the number of cigarettes which smoke per week were (36.6%) for those who smoke less than a cigarette weekly,(7.3%) for those who smoke 1 to 7 cigarettes weekly ,(0.5%) for those who smoke 14 to 21 cigarette weekly and (0.9%) for the participants who smoke 35 or more cigarettes weekly.

Table 5.19: illustrates the ratios percentage of the participants students related to the smoking nargilla habit

No.	Smoking habit	Percentage%
1	no	60.6
2	yes	39.4

4. From Table (5.19) ,it can be seen that the ratios percentage of the participants students related for the nargilla smoking were(60.6%) for those who never smoked nargilla and (39.4%) for those who were used to smoke nargilla.

Table 5.20: illustrates the ratios percentage of the participant students related to their number of times of smoking nargilla per a fixed period

No.	Frequency of nargilla smoking	Percentages%
1	Daily	2.4
2	At least one time per week, but not daily	47.4
3	Less than one time per week	23.6
4	Not smoking nargilla	26.7

5. From Table (5.20), it can be seen that the ratios percentage of the participants students (39.4%) related to the number of time of nargilla smoking were (2.4%) from those who use to smoke daily, (47.4%) for those who used to smoke nargilla one time at least weekly,(23.6%) for those who used to smoke nargilla one time in less than a week and (26.7%) for the participants who never smoked nargilla.

5.4 Clinical Examination Results

As the researcher had examined all the study sample students (424). The oral examinations were composed of two parts these are Community Periodontal Index for Treatment Needs (CPITN) and Simplified Oral Hygiene Index (SOHI).The researcher had divided the mouth into six sextants in each index. The sextants which were examined in the present study are 2544 (upper right, upper middle, upper left, lower right, lower middle ,lower left).The no. of the sextants were examined in this study are 2544 for each index.

Table 5.21: shows the ratios percentage of participant students according to their periodontal status

Periodontal status		Students' No.	Percentages%
	Healthy gingiva	111	26.2
Diseased gingiva	Bleeding	174	41.0
	Calculus	139	32.8
Totals		424	100

1. From Table (5.21), it can be seen that the ratios percentage of the participant students related to the experienced of periodontal status were (41.0%) for those who affected by gingival bleeding, (32.8) for those who affected by supra-gingival calculus and only (26.2%) of them were had healthy gingival (see fig 5.21 in appendix 4).

Table 5.22: distribution of the participant students according to their periodontal status and its site in the jaw

The jaw	Periodontal Status		right	middle	left
upper	Healthy	frequency	246	186	250
		Percentage （%）	58.0	43.9	59.0
	Bleeding only	frequency	114	106	106
		Percentage （%）	26.9	25.0	25.0
	Calculus only	frequency	62	130	64
		Percentage （%）	14.6	30.7	15.1
	Excluded sextant	frequency	2	2	4
		Percentage （%）	0.5	0.5	0.9
	Total	frequency	424	424	424
		Percentage （%）	100.0	100.0	100.0
lower	Healthy	frequency	279	169	281
		Percentage （%）	65.8	39.9	66.3
	Bleeding only	frequency	73	60	81
		Percentage （%）	17.2	14.2	19.1
	Calculus only	frequency	48	194	43
		Percentage （%）	11.3	45.8	10.1
	Excluded sextant	frequency	24	1	19
		Percentage （%）	5.7	0.2	4.5
	Total	frequency	424	424	424
		Percentage （%）	100.0	100.0	100.0

2. From Table (5.22), it can be seen that ratios percentage of the sites of the upper jaw of the participant students which were healthy are (58%) ,(43.9%) and (59%) of the right, middle and the left sites respectively.

The recorded ratios of the same sites show that the percentage levels of the gingival bleeding and the supra-gingival calculus. The healthy ratios of the lower jaw of the same participant students were (65.8%),(39.9%) and (66.3%) for the right ,middle and the left sites respectively. The ratios of gingival diseases (bleeding or calculus) of the three sits are presented in this table for the upper and lower jaws.

Table 5.23: shows the ratios percentage of the participant students according to their Distribution of the participants according to their oral hygiene status

Oral hygiene status	Students' No.	Percentages%
No debris	32	7.5
Debris	392	92.5
Total	424	% 100.0

2. Table (5.23) indicates that the ratios percentage of the participant students were only (7.5%) which is had no debris on their teeth while the higher ratio (92.5%) which was had experienced debris on their teeth (see fig 5.23 in appendix 5).

Table 5.24: shows the ratios percentage of the participant students according to the affected sites of their teeth by debris abundant

jaw	Oral hygiene status	right	middle	left
upper	No debris (%)	15.1	8.5	15.1
	debris on the one third of the tooth surface (%)	53.8	34.9	53.3
	debris on the two third of the tooth surface (%)	25.7	36.6	26.4
	debris on the all tooth surface (%)	5.4	20.0	5.2
lower	No debris (%)	14.9	8.0	14.6
	debris on the one third of the tooth surface (%)	52.6	32.5	53.1
	debris on the two third of the tooth surface (%)	25.9	37.7	26.9
	debris on the all tooth surface (%)	6.6	21.8	5.4

4. From Table (5.24), it can be seen that the ratios percentage of the sites of the teeth for the upper jaw were with no debris for the ratios of (15.1%),(8.5) and (15.1%) of the right, middle and the left sites of the jaw respectively. But the other recorded ratios for the upper jaw show that the teeth were experienced debris abundant with 1\3,2\3 and 3\3 or fully covered teeth surfaces.

The recorded ratios of the same sites of the lower jaw teeth show that (14.9%),(8%) and (14.6%) for the right, middle and the left sites respectively were with no debris ,while the affected sites that recorded in the table were experienced with debris cover of 1\3,2\3 and 3\3 or fully covered teeth surfaces.

5.5 Statistical Analysis of the Results

5.5.1 The relationships between the oral hygiene practices and CPITN:

Null hypothesis: there is no statistical relationship between oral hygiene level and periodontal diseases in the 15 years old students in Nablus city.

Table 5.25: indicates the relationships between oral hygiene practices and CPITN

Variables of oral hygiene practices		CPITN						Significant
		Healthy		Bleeding		Calculus		P- value
		n	%	n	%	n	%	
Teeth brushing	yes	83	19.6	130	30.7	95	22.4	0.383
	no	28	6.6	44	10.4	44	10.4	
No. of teeth brushing daily	one time or less	46	14.9	72	23.4	59	19.2	0.855
	twice	29	9.4	44	14.3	27	8.8	
	three times or more	8	2.6	14	4.5	9	2.9	
The time of teeth brushing	one min. or less	21	6.8	41	13.3	32	10.4	0.500
	Two (mins).	29	9.4	35	11.4	20	6.5	
	more than two (mins).	13	4.2	22	7.1	14	4.5	
	did not know	20	6.5	32	10.4	29	9.4	
Dental floss using	yes	17	4.0	20	4.7	18	4.2	0.645
	no	94	22.2	154	36.3	121	28.5	
Dentist visit	yes	82	19.3	131	30.9	107	25.2	0.849
	no	29	6.8	43	10.1	32	7.5	
The reason of the dentist	regularly	9	2.8	19	5.9	9	2.8	0.207

visiting	occasionally	16	5.0	13	4.1	14	4.4
	Pain	57	17.8	99	30.9	84	26.3

- The Table (5.25) illustrates the Chi –square test that was used to assess the relationships between oral hygiene practices and CPITN in the participant students. These illustrations including the variables participant students brushing their teeth (p=0.383), the number of teeth brushing /day (p=0.855), the times of brushing (p=0.855), dental floss using (p=0645), the dental visits (p=849) and the reason of dentist visiting (p=0.207).

- There is no significant statically relationships between oral hygiene practices and the gingival status in the students under study, as these variables have the P- values higher than (0.05) .

5.5.2 The relationships between nutritional habits and CPITN:

Null hypothesis: there is no statistical relationship between nutritional habits and periodontal diseases in the 15 years old students.

From Table (5.26) below, it can be notice that:

- Chi –square was used to assess the relationships between nutritional habits and CPITN.

- There is a significant statistical relationships between the times (frequency) of meat consumption per week and the gingival status in the students under study (p=0.006).

- There is no significant statistical relationship among the variables presented in this table and the gingival status, as these variables have P- values higher than (0.05).

Table 5.26: the relationships between nutritional habits variables and CPITN

Variables of nutritional intake		CPITN						Significant
		Healthy		Bleeding		Calculus		P- value
		n	%	n	%	n	%	
No. of breakfast taking per week	No one	12	2.8	13	3.1	17	4.0	0.658
	One time	4	0.9	9	2.1	2	0.5	
	Twice	14	3.3	16	3.8	11	2.6	
	Three times	4	0.9	10	2.4	7	1.7	
	Four times	2	0.5	6	1.4	4	0.9	
	Five times	6	1.4	16	3.8	14	3.3	
	Daily	69	16.3	104	24.5	84	19.8	
Fruits eating frequency / week	never	6	1.4	11	2.6	7	1.7	0.171
	Less than one time	3	0.7	13	3.1	4	0.9	
	Once time	8	1.9	10	2.4	8	1.9	
	2-4 times	36	8.5	30	7.1	40	9.4	
	6 times	7	1.7	12	2.8	9	2.1	
	Once daily	27	6.4	39	9.2	30	7.1	
	More than one time daily	24	5.7	59	13.9	41	9.7	
vegetables eating frequency / week	never	3	0.7	12	2.8	8	1.9	0.366
	Less than one time	5	1.2	19	4.5	11	2.6	
	Once time	7	1.7	6	1.4	8	1.9	
	2-4 times	32	7.5	42	9.9	35	8.3	
	6 times	14	3.3	13	3.1	9	2.1	

	Once daily	22	5.2	46	10.8	38	9.0	
	More than one time daily	28	6.6	36	8.5	30	7.1	
Sweats eating frequency/week	never	3	0.7	14	3.3	4	0.9	0.215
	Less than one time	9	2.1	16	3.8	12	2.8	
	Once time	11	2.6	13	3.1	14	3.3	
	2-4 times	29	6.8	29	6.8	31	7.3	
	6 times	10	2.4	8	1.9	5	1.2	
	Once daily	20	4.7	45	10.6	31	7.3	
	More than one time daily	29	6.8	49	11.6	42	9.9	
Juice drinking frequency/week	never	4	0.9	14	3.3	5	1.2	0.640
	Less than one time	17	4.0	28	6.6	14	3.3	
	Once time	9	2.1	9	2.1	11	2.6	
	2-4 times	31	7.3	41	9.7	44	10.4	
	6 times	5	1.2	9	2.1	9	2.1	
	Once daily	23	5.4	40	9.4	30	7.1	
	More than one time daily	22	5.2	33	7.8	26	6.1	
Milk drinking frequency/week	never	46	10.8	80	18.9	62	14.6	0.504
	Less than one time	18	4.2	25	5.9	14	3.3	
	Once time	8	1.9	10	2.4	7	1.7	
	2-4 times	8	1.9	17	4.0	20	4.7	

	6 times	2	0.5	4	0.9	6	1.4	
	Once daily	25	5.9	32	7.5	21	5.0	
	More than one time daily	4	0.9	6	1.4	9	2.1	
Meat eating frequency/week	never	9	2.1	11	2.6	4	0.9	0.006
	Less than one time	2	0.5	18	4.2	3	0.7	
	Once time	12	2.8	15	3.5	8	1.9	
	2-4 times	56	13.2	99	23.3	92	21.7	
	6 times	5	1.2	8	1.9	9	2.1	
	Once daily	20	4.7	19	4.5	16	3.8	
	More than one time daily	7	1.7	4	0.9	7	1.7	
Water drinking frequency/week	Never	0	0.0	0	0.0	0	0.0	0.553
	Less than one time	0	0.0	0	0.0	0	0.0	
	Once time	0	0.0	0	0.0	0	0.0	
	2-4 times	2	0.5	1	0.2	3	0.7	
	6 times	4	0.9	5	1.2	4	0.9	
	Once daily	6	1.4	3	0.7	4	0.9	
	More than one time daily	99	23.3	165	38.9	128	30.2	

5.5.3 The relationships between socioeconomic status and CPITN:

Null hypothesis: there is no statistical relationship between SES and periodontal diseases in the students under study.

From Table (5.27) below, it can be notice that:

- Chi –square was used to assess the relationships between SES and CPITN.
- There is a statistical relationship between the working status of the participants' mothers and the gingival status in the students under study (p=0006).
- There is no significant statistical relationships among the variables that presented in this table and the gingival status, as these variables have p- values higher than (0.05).

Table 5.27: indicates the relationships between the family factors of the students' house living and CPITN

Variables of house living		CPITN						Significant
		Healthy		Bleeding		Calculus		P- value
		n	%	n	%	n	%	
Who live with the students?	Mother only	5	1.2	11	2.6	9	2.1	0.137
	Father only	1	0.2	3	0.7	1	0.2	
	Both mother and father	102	24.1	160	37.7	129	30.4	
	Live with others	3	0.7	0	0.0	0	0.0	
The no. of brothers and sisters?	0	1	0.2	3	0.7	4	0.9	0.670
	1-2	30	7.1	43	10.1	26	6.1	
	3-4	53	12.5	81	19.1	72	17.0	
	5 or more	27	6.4	47	11.1	37	8.7	
Mother's working status	working	18	4.2	36	8.5	14	3.3	0.039
	Not working	93	21.9	138	32.5	125	29.5	
Father's working status	working	97	22.9	150	35.4	123	29.0	0.834
	Not working	14	3.3	24	5.7	16	3.8	

Mother's educational level	High	29	6.8	43	10.1	27	6.4	0.593
	Middle	40	9.4	55	13.0	49	11.6	
	Lower	42	9.9	76	17.9	63	14.9	
father's educational level	High	37	8.7	56	13.2	35	8.3	0.497
	Middle	29	6.8	54	12.7	47	11.1	
	Lower	45	10.6	64	15.1	57	13.4	
Economic status of the students' families	High	28	6.6	49	11.6	40	9.4	0.377
	Middle	79	18.6	111	26.2	86	20.3	
	Lower	4	0.9	14	3.3	13	3.1	

5.5.4 The relationship between smoking habits and CPITN:

Null hypothesis: there is no statistical relationship between smoking and periodontal diseases in the students under study.

From Table (5.28) below, it can be notice that:

- Chi –square was used to assess the relationships between smoking habits and CPITN.
- There is no significant statistical relationships among the variables that presented in this table and CPITN codes .This means that there is no effects for the smoking habits on the gingival status in the participant students, as these variables have p-values higher than (0.05) .

Table 5.28: shows the relationships between the Smoking habits and CPITN

Variables of smoking			CPITN						Significant
			Healthy		Bleeding		Calculus		P- value
			n	%	n	%	n	%	
Cigarettes smoking status in past		Yes	11	2.6	25	5.9	24	5.7	0.252
		No	100	23.6	149	35.1	115	27.1	
Smoking frequency per week		Daily	1	0.2	3	0.7	4	0.9	0.493
		More than one	40	9.4	65	15.3	60	14.2	
		Less than one	3	0.7	8	1.9	8	1.9	
		Not smoke	67	15.8	98	23.1	67	15.8	
Nargilla smoking status		Yes	47	11.1	63	14.9	57	13.4	0.523
		No	64	15.1	111	26.2	82	19.3	
Nargilla Smoking frequency per week		Daily	1	0.2	6	1.4	3	0.7	0.733
		More than one	51	12.0	79	18.6	71	16.7	
		Less than one	30	7.1	41	9.7	29	6.8	
		Not smoke	29	6.8	48	11.3	36	8.5	

5.5.5 The correlations between SOHI and CPITN:

Table 5.29: shows the relationships between the gingival status and the teeth status

Teeth status	Gingival status		Total%
	Healthy %	Diseased %	
Clean	6.6	0.9	7.5
Not clean	19.6	72.9	92.5
Total%	26.2	73.8	100.0

Table 5.30: shows the relationships between SOHI and CPITN

Variables		CPITN					
		Healthy		Bleeding		Calculus	
		n	%	n	%	n	%
SOHI	No Debris	28	6.6	3	0.7	1	0.2
	Debris on 1/3 of teeth surfaces	64	15.1	118	27.8	60	14.2
	Debris on 2/3 of teeth surfaces	19	4.5	50	11.8	57	13.4
	Debris on 3/3 of teeth surfaces	0	0.0	3	0.7	21	5.0

Table (5.29)&Table (5.30) shows the relationships between SOHI scores and CPITN scores .In terms of this relationships ,the Pearson Correlation Coefficient was used to

examine the effected relationships of the gingival status and the oral hygiene status of the participant students.

Table 5.31: Pearson Correlation results between SOHI &CPITN

Oral hygiene status		Gingival status
	"Pearson" Correlation Coefficient	0.399
	Statistical significant value	0.000
	Study sample	424

From Table (5.31), it can be concluded that there was a strong correlation between oral hygiene level and gingival status in the participant students, as the value of Pearson Coefficient was (0.399), and the significance value is (0.000)

$$P=0.000<0.05$$

This means that there is a positive effect of the oral hygiene status on the gingival status and vice –versa in the participant students.

5.6 The effects of sex and type of school on gingival status

5.6.1 Sex and gingival status

Table 5.32: the relationships between sex and CPITN

Variables Gender		CPITN					
		Healthy		Bleeding		Calculus	
		n	%	n	%	n	%
Sex	male	42	9.9	77	18.2	82	19.3
	female	69	16.3	97	22.9	57	13.4

From the Table (5.32), it can be observe that there was some differences in the gingival status according to sex ,as the healthy gingiva was seen more among females (16.6%) than males (9.9%),bleeding gingiva was seen more among females (22.9%) than males(18.2%), while calculus was seen more among males (19.3%) than females(13.4%).

To test the relationships between sex and CPITN, T-Independent Samples test was used as following.

Table 5.33: T-Independent Samples results of the relationships between sex and gingival status

Sex	Frequency	Mean	Standard Deviation	T- Value	Significant " P- Value "
Male	201	0.7910	0.4076	2.360	0.019
Female	223	0.6906	0.4633		

From Table (5.33), it can be seen that there is variations in means of gingival status with statistical significance , as T- value =2.360 with p value = 0.019 , and as p value =0.019<0.05 ,this mean that the sample students have a variations in their gingival status with their sex .

5.6.2 Type of school and gingival status

Table 5.34: relationship between type of school and CPITN

Variable		CPITN					
		Healthy		Bleeding		Calculus	
		n	%	n	%	n	%
School type	governmental	93	21.9	158	37.3	128	30.2
	private	18	4.2	16	3.8	11	2.6

Table (5.34) illustrates the relationship between type of school of the sample students and their gingival status, and to examine this relationship, T-Independent Samples test was used as the following.

Table 5.35: T-Independent Samples results of the relationships between type of the school and gingival status

School type	Frequency	Mean	Standard Deviation	T- Value	Significant " P- Value "
governmental	379	0.7546	0.4309	2.239	0.026
Private	45	0.6000	0.4954		

From Table (5.35), it can be seen that there is variations in means of gigngival status with statistical significance, as T- value =2.239 with p -value = 0.026, and as p value

= 0.026 <0.05, this mean that the sample students have a variations in their gingival status with their type of schools.

5.7 Treatment needs

Table 5.36: illustrates the treatment needs in the sample students

Criteria	CPITN	treatment	Sextant no.	Treatment type
Healthy	0	T0	1411	None
Bleeding	1	T1	540	OHE
Calculus	2	T2	541	OHE & Scaling

Table (5.36) show that 450 sextants are needed to oral hygiene instructions only,451 sextants are needed to oral hygiene instructions and scaling ,while 1141 sextants are not needed to treatment.

5.8 Periodontal diseases in 15 years old students in the eyes of gingival index (GI)

Introduction (some identification for the gingival indices)

Several gingival indices have been introduced and developed in an attempt to accommodate and quantify the gingival diseases. Gingival scores have been measured the inflammation at histological and clinical levels as they assess colour, contour, consistency, crevicular fluid flow, and bleeding of the gingiva (Greenstein, et al, 1981). Dental professionals in their clinical practice used gingival indices to assess the initial disease status, and to evaluate the outcomes of their effective interventions. The researchers have used the gingival indices to identify the prevalence and the incidence of the disease, as well as the outcome of the treatment or the product intervention in their clinical trials. The researchers have been identified 15- gingival indices that used for the adult populations. Many of these indices were used the tissues description which were susceptible to subjective "examiner subjective" such as "slight", "marked"

or "obvious". Other indices such as the Papillary Marginal Attachment Index, Gingival Index, Modified Gingival Index, and Papillary Bleeding Score gave no suitable era for the measurements of the entire gingival unit or for measurement of both the buccal and lingual gingiva (Donnelly,2010).

5.8.1 The gingival index (GI)

A numerical rating scale (figuring) for classifying the periodontal status of a person or population. The GI was introduced at 1963 by Loe and Sileness. Since then and up to now, this index have been used to assess the prevalence as well as the severity of the condition. It is based upon probe measurement of periodontal pockets and on gingival tissue status (GI, 2011).

In this index each tooth is examined at the mesial, lingual, distal, and facial (or buccal) surface. A probe is used to press on the gingiva to determine its degree of firmness, and to run along the soft tissue wall adjacent to the entrance to the gingival sulcus (see appendix 7).

Scores and Criteria of GI

0= Normal gingiva

1= Mild inflammation-slight change in color, slight edema; no bleeding on probing

2= Moderate inflammation-redness, edema, and glazing; bleeding on p probing

3= Severe inflammation-marked redness and edema; ulceration; tendency to spontaneous bleeding

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Each surface is given a score, then the scores are summed and divided by four. That number is divided by the number of teeth examined to determine the GI.

Ratings are 0 = excellent; 0.1-1.0 = good; 1.1-2.0 = fair; 2.1-3.0 = poor (Chaves, et al, 2005).

Despite the clarity of the index categories, after more than 30 years of use, it is apparent that experienced clinical examiners vary widely in their interpretation. In an

attempt to partly address this limitation, some examiners prefer only to record the presence or absence of bleeding on gentle probing (Galgut, et al, 2001). The instruments which are used for GI : mouth mirror, periodontal probe.

This index can be used both as simplified or a full mouth index.

The teeth were selected are: 16, 12,24,36,32 and 44 (Rao, 2008).

Tsami et al (2010) in their study, which included indices adoption, they proposed that the Community Periodontal Diseases for Treatment Needs Index, the Simplified Gingival Index and Oral Hygiene Index were significantly statistically correlated with the presence of a coexisting disease, frequency of teeth brushing and bleeding upon brushing. This proposal seems to be in accordance with the obtained data of the present study. The CPITN scores therefore could be correlated with the GI scores. The present study proposed that score 1 of CPITN which is = (gingival inflammation), is presenting the score 2&3 in GI (score 2= mild gingival inflammation with slight oedema, score 3= moderate gingival inflammation with oedema) .

Table 5.37: shows the ratios percentage of the participant students according to their gingival status

gingival status		Students' No.	Percentages%
	Healthy gingiva	111	26.2
Diseased gingiva	Mild inflammation with slight oedema	87	20.5
	Moderate inflammation with oedema	87	20.5
	Severe inflammation with marked redness and oedema	139	32.8

Totals	424	% 100.0

From Table (5.37), it can be seen that the ratios percentage of the participant students who experienced gingival diseases were (20.5%) for those who were with mild inflammation, (20.5) for those who have moderate inflammation with redness oedema, glazing with bleeding on probing, (32.8) for those who have severe inflammation, marked redness, oedema with tendency to spontaneous bleeding and only (26.2%) of the students were with healthy gingiva .

Table 5.38: shows the correlations between SOHI and GI

Variables		GI						
		Healthy		Mild inf.		Moderate inf.		Severe inf.	
		n	%	n	%	n	%	n	%
SOHI	No Debris	28	6.6	1	03	2	0.4	1	0.2
	Debris on 1/3 of teeth surfaces	64	15.1	59	13.4	59	13.4	60	14.2
	Debris on 2/3 of teeth surfaces	19	4.5	25	5.9	25	5.9	57	13.4
	Debris on 3/3 of teeth surfaces	0	0.0	1	03	2	0.4	21	5.0

Table (5.38) shows the correlation between SOHI scores and GI scores. According to these scores correlations, it can be observed that the gingival status of the participant students in the present study were affected by the oral hygiene status of these students which is represented by the SOHI scores (see table 5.31).

CHAPTER SIX

1. Discussion

Periodontal diseases have been defined as "a group of lesions affecting the tissues surrounding and supporting the teeth in their sockets". The majority of periodontal diseases are including gingivitis and periodontitis. These diseases occur as a result of the presence of bacterial plaque or calculus on supra-gingival or sub-gingival teeth surfaces. It is generally accepted that periodontal diseases begin as gingivitis, which progresses on, in some individuals, to periodontitis (Carranza, 2006). It is now established that periodontal diseases are initiated by bacterial plaque. Host defense mechanisms appear to be an active factor against the periodontal diseases (Carranza, 2006; Jinkins,2007; Lorencini,et al,2009). In addition, a number of systemic abnormalities are thought to be affect the host response to the local irritants, which increasing the severity of the diseases (Whelton &Mullane, 2007; Lorencini, et al, 2009). Health inequalities are obviously related to social and environmental inequalities. This is also applies to periodontal destruction (Borrell, 2006; Bower, et al, 2007). It has been accepted that the bacterial effects are essential for gingivitis and periodontitis to occur; also there is a consensus acceptance that most gingivitis does not necessarily resulted to periodontitis (Carranza, 2006; Lorencini, et al, 2009).

This study was the first epidemiological survey in the West Bank region to highlight the problem of periodontal diseases and their related risk factors in 15-years old schools' students. Epidemiological assessment of periodontal diseases burden on the basis of this study data and on the basis of other studies is complex, since yet no epidemiological standard definition for gingivitis and periodontitis has been widely accepted (Page& Eke,2007; Savage, et al, 2009). Additionally, comparison with

published studies is complicated due to different definitions for periodontal diseases, methodological, and recording disparities (Albandar&Ramus, 2002). This study presents a representative sample of the Palestinian 9th grade schools students which are aged 15-years in Nablus city. Simple random clustered sampling technique was used to select 424 students from 9 schools.

Determining the prevalence of periodontal diseases is a necessary step for the health care planners in order to identify the resources needed for the dental services in the community and to provide preventive and curative services to combat dental health problems.

Two systems of indices were used, these are CPITN & SOHI, Also several statistical analysis were employed for examining and determining the prevalence of periodontal diseases and their relation with preventive oral hygiene behaviors, smoking, SES, and nutritional habits in the students under study.

A. Periodontal Treatment Needs

The ratio percentage of the participant students was (73.8%) for those who were have unhealthy gingiva, (41.0%) for those students who were have gingival bleeding (=score 1 of CPITN), (32.8 %) for those students who have supra-gingival calculus(=score 2 of CPITN) and only (26.2%) of the participant students were with healthy gingiva. These results were in agreement with the concluded results of Ibrahim (2010) in Al-Sudan, Jain (2009) in India, Kazemnejad et al (2008) in Iran and Beltran, et al (2006) in Tanzania.

The numbers of the healthy sextants of the participant students were 1141 and the number of sextants which were in need to the treatments was 1081. From the latter unhealthy sextants number, 540 sextants were needed oral hygiene instructions and 541 were needed oral hygiene instructions and scaling. Similar results have been showed by Beiruti et al (2001) in Syria. Also almost similar results were reported in Saudi Arabia, Pakistan, Lebanon (WHO, 2008a) and in Nigeria (Kolawole, et al, 2011).

B. Simplifies Oral Hygiene Index and Oral Hygiene Activities

Oral hygiene status, in means of SOHI, was measured to be (92.5%) of the participant students who were with bad oral hygiene status. The correlation between oral hygiene status and CPITN shows a significant statistical relationship with p-value= 0.000.This results were in good agreement with the results of Albandar (2002) & Nyvad (2003) studies.

In this study, it was found that (27.4%) of participant students were used to not brush their teeth, while (72.6%) of them were used to brush their teeth daily. The obtained results were in agreement with Philippinian students (Yabao, et al, 2005) who got similar results in the students of the 12- years old. The frequency of teeth brushing in the participant students of the mentioned percentage (72.6%) were (41.7%) of them were used to brush their teeth once daily, (23.6%) for those who use to brush their teeth twice daily,(7.3%) who used to brush their teeth for more than twice daily. Similar results were reported in Kuwait by Al-Nasari (2003) and in Niger by Ayanbadejo et al (2005).Also the present results were in accordance with the results of Khami et al (2006) and Kirtiloglu et al (2006).Twice daily brushing was recommended for better improving plaque control and to achieve sufficient plaque removal by performing oral hygiene measures at home (Attin, et al, 2005).

It was found also in relation to the duration of brushing in the participant students that (22.2 %) of participants need a minute or less to brush their teeth, while (19.8%) of them need two minutes and the lowest ratio (11.6%) for those who take more than two minutes to brush their teeth. Nighnteen point one percent of participants didn't know how much time the brushing their teeth take. The founded percentage ratios of the brushing durations of the participant students were a bit less than the teeth brushing durations in Nigeria (Clement, et al, 2010) and in other studies (Khami, et al, 2006; Kirtiloglu,et al,2006; Khami, et al,2007).The other results may be related to the special affecting factors.

Dental floss is the most recommended interproximal plaque remover where a tooth brush cannot reach where a toothbrush cannot reach (Ficshman, 1997).Because the interproximal area is unreachable ,the earliest periodontal lesions may form there and be more frequent and sever (Bader, 1998).Now more research is pointing to periodontitis and its systemic effects (Grossi,2001).It has been theorized that

periodontal pathogens work their way through the blood stream, affecting distant sites. Bacteremia caused by flossing irregularly can be avoided by daily flossing (Carroll &Sebor, 1980). It has shown in numerous studies that the practice of daily flossing is quite low (Stuart, 2004).

In the present study it was found that the majority of participant students (87%) do not use the dental floss as an adjunctive teeth cleaning activity. This results was agree with results in Spain which found that (13.5%) of respondents answered they flossed daily (frequent flossing), while (29.5%) of the respondents said they flossed irregularly (Infrequent flossing), and (57%) reported not flossing at all.

In the present study it was found that only (9.0%) of the participant students were visited the dentist regularly twice yearly or once every 6- 12 months. Similar results were recommended by Yabao (2005) in Philippine. A ratio of (56.6%) of the participant students were visited the dentist only when they suffer from teeth ache, while (10.1%) of participants had visited the dentist irregularly. Similar results were reported by Al-Omiri, et al (2006) in Jordan.

while (24.5%) of participants did not had a previous visit to a dentist at all during their past life, while the highest ratio (75.5%) was for students who had a previous visit to the dentist ,of them (56.6%) had visit the dentist when they suffer from teeth ache while (10.1%) of participants had irregular visits to the dentists. This results similar to the results in the Jordan (Al-Omiri, et al, 2006).

Also it was found in this study around (50%) from the participant students had visited the dentist since more than a year and this frequency of dentist visiting in the study students was less than the global frequency because the global proportion of the adult population who had not visited the dentist for at least 12 to 24 months was declined since 1980.The dentist visiting frequency was changed with the changes in the dental insurance systems in developed countries, especially during recent years ,with increased costs to the patient ,may be a contributory reason for visiting a dentist frequently (Ekman, 2006).

A dental visit every six months is recommended. In U.S, this time scale is recommended for around 75 percent of the population, although it is thought that a

great number of this percentage will visit the dentist less than the recommended bi-annual guideline as 12 years students in Philippine (Yabao, 2005).

Also it was found, no significant statistical relationships between these oral hygiene activities and gingival status in the participant students of 15- year's old students in Nablus city. These results were in good agreement with the reported results of Kolawole et al (2011).

C. The Nutritional and Diet Habits

In the present study it was found that (60%) of the participant students were used to take their breakfast daily. Similar result was reported in the 15- years old American students (ABCnews, 2005). But the number of breakfast intake by the participant students was lower than the number that reported in Norwegian students of the same age (Ask, et al, 2006).The different of this result may be related to the differences in the nutritional and diet activities in different countries.

In the present study, it was found that (28%) of the participant students were consuming sweets more than once daily. Similar results were reported by Al-Aqra'a (2006) in Bethlehem in the students of 12-years old. But this frequency was twice the recommended by WHO (WHO&FAO, 2003).

A ratio (58.3%) of the participant students were eating meats 2 to 4 times weekly. This result was in agreement with the reported findings in Canada, America and Mexico (CROP, 2004). The present study results for eating meats by the participant students in Nablus city were higher than that frequencies in Bethlehem 12-years old students (Al-Aqra'a, 2006). These variations in the results may be related to the differences of the affecting factors. The present activities of the meats eating showed significant statistical relationships with gingival status with p-value=0.006.

A ratio of (25%) of the participant students were consuming fruits and vegetables 2 to 4 times weekly. Lower ratios of 12-years old students for the fruits and vegetables consumption were obtained by Al-Aqra'a (2006) in Bethlehem. These variations in the results may be related to the differences of the affecting factors.

It was found that, there was no statistical relationship between the nutritional and diet variables and CPITN scores, it means that there was no effect for these variables on the gingival status 15-years old students in Nablus city.

D. The Smoking Habits

During the last 30 years, smoking has recognized as an effective risk factor for the health in general as well as for the oral health (Tomar&Asma, 2000). Smoking was associated with higher periodontal treatment needs (Natto, 2005; Bergstrom, 2006).

In the present study. Both intensity and duration of smoking in the Palestinian students of 15 years old were assessed. It was found that (85.8%) of the participant students were non-smokers in the past times .In the present time a ratio of (54.7%) from the participant students were non-currently smokers, and (45.3%) of them were currently smokers. The latter ratio was higher than the ratio (20.8%) that found to be present in 2006 for the American students smokers (CDC, 2007). Also the mentioned ratio (45.3%) was higher than the ratio of the smokers (23.3%) in Canada and Great Britain (McMurray, 2004). But the ratio of the smokers in Jordan (51%) which was reported by CDC (2003) was higher than the ratio of the present study .In Palestine , PCBS (2006) reported that the rate of smoking in persons of age 15-29 years old was (17.6%).

In the present study it was found that (36.6%) of the participant students were smoked an average of less than one cigarette weekly. In general an average of 15 cigarettes was globally reported to be smoked. In America and Europe, 18 cigarettes were smoked daily by people (think quest statistics, 2011).

In the present study it was found that there was no statistical relationship between the smoking variables and CPITN scores; this means that there was no effect for the mentioned smoking variables on the gingival status of the participant students. Similar findings were reported by Lopez et al (2001) who found no evidence for increased level of risk in developing periodontitis in Chilean students of age 12–21 years old. Lopez et al (2002) found no relationships between the destructive periodontal conditions and cigarettes smoking.

Water pipe (sheesha, hookah, nargila); is a special device in which the inhaled smoke is passing through long tube and a water trap to aid in filtering and reducing the inhaled nicotine for the smokers (Rastam, et al , 2004).

In the present study, it was found that there was no statistical relationship between the nargilla smoking and CPITN with P-value higher than (0.05). This means that there was no effects of the nargilla smoking on the gingival status on the 15-years old students. The present results were in accordance with findings of Ashri & Al-Sulamani (2003) ; Baljoon et al (2005) and Dar-Odeh et al (2010).They reported that, the relationships between the water pipe smoking and the periodontal health was with little significant relationships.

E. Socioeconomic Status

In the present study the socioeconomic effects was assessed as in the following terms:

- With whom the participant students were living (with either mother, father, both or others).The results showed that (92.2%) of the participant students were lived with their parents in the same house. The statistical analysis showed no relationships between with whom the participant students were living and CPITN scores with P- value higher than (0.05) in the 15 -years old students .

- Number of the brothers and sisters who were living with the participant students indicated the following ratios: (26.4%) of the students were living with five or more brothers and sisters,(25.0%) of the students were living with four brothers or sisters and only (1.9%) of the students were with no brothers or sisters.The statistical analysis showed that no relationships between the number of brothers and sisters who were living with the participant students and the CPITN scores with P- value higher than (0.05) in the 15-years old students .This means that no effects of the type of house livings on gingival status in the 15-years old students.

- The effects of the working status of the parents of the participant students' were indicated the following ratios: (87%) of the students' fathers were having

a job, (16.0%) of the students' mothers were having a job. The statistical analysis indicated that, there was no relationships between the working status of the students' fathers and the CPITN scores with P- value higher than (0.05) in the 15 years old students; while there was a significant statistical relationships between the working status of the students' mothers and the CPITN scores with P- value =0.039 in the 15 years old students.

- The effects of the educational levels of the participant students' parents were indicated that (30.2%) of the participant students' fathers achieved the higher level of education and (39.2%) of the students' fathers achieved the lower level of education; while (23%) of the participant students' mothers achieved the high level of education, (42.7%) of the students' mothers achieved the lower level of education. There was no significant statistical relationships between the educational levels of students' fathers and mothers with the CPITN scores (P- values higher than 0.05) in the 15 years old students.

- The effects of the economic status of the families of the participant students as the students opinion showed that (50.5%) of the students were classified in the high economic status, (42.2%) of the students were classified in the middle economic status with their families; while only (7.3%) of the students were classified in the low economic status. There was no significant statistical relationships between the economic status of the students' families with the CPITN scores (P-value higher than 0.05) in the 15-years old students.

The results of this study were in agreement with the findings of Sakeen (2006) who reported that, the gingivitis was prevalent in children of both high and low economic status in their families. The obtained results were also in accordance with the findings of Taani (2002) in Jordan. He reported that the gingival status was worse but not significantly worse among poor children than they were among rich children.

However,the periodontal health of many documented results and for many years have shown significant differences in a variety of groups and areas (Albandar, 2000). The high- income of Blacks, as an example exhibited a higher prevalence of periodontitis than did low- income Blacks and high- income whites (Luisa, et al, 2008). The dental health education was recommended for both the poor and rich SES groups in Jordan (Taani, 2002).

In present study, it was found that (82.2%) of the participant students' mothers were housekeepers with no jobs, thus they belong to the low level of education and SES. Such circumstances were reflected on the results of the statistical analysis which showed a significant statistical relationship between SES and the CPITN scores. Similar conclusion was reported by Craig et al (2001); Sheiham &Netuveli (2002); Vallejos et al (2008) who said that the high frequency of periodontal diseases worldwide is associated with lower social class.

Conclusions

The present research is a continual potential to be added to the theoretical five semesters of studies to achieve the MSc degree.

The present research study supported some conclusions, mainly the followings:

1. In Palestine the oral health systems are in a transitional developmental state. Comprehensive preventive programmes are needed. A comprehensive plan for oral health care is needed for the students in particular and for all the public in general.

2. The dentist, schools, parents have to increase the awareness for the necessity of preventive oral health programmes.

3. The social organizations and the public health authorities are required to address the discrepancies in oral health hygiene in the early childhood, adolescence and older ages and addresses the educational platforms and oral health care in wide social publications.

4. Further research studies of the oral health in Palestine is a necessary task, both in the students and other classes of population.

The upper mentioned conclusions are based on many of the present results; some of these findings are mainly the followings:

- The majority of the participant students (92.5%) were diagnosed to have bad oral hygiene .Such a result seems to be reflected on increasing ratio (73.8%) of the periodontal diseases prevalence in the 15-years old students.
- The higher percentage ratio (72.6%) of the participant students, although they used to brush their teeth but they did not know the right and the accurate methods of the teeth brushing; others (27.4%) they were never brushed their teeth at all.
- The higher ratio (56.6%) of the participant students never visited the dentist, but only when they severely suffer from the teeth ache

3. Recommendations

Periodontal diseases are considered the diseases of worldwide prevalence which constitutes important public health challenges. Identifying these diseases and

determining their magnitude and distribution in population are major steps in controlling or maintaining them at an acceptable level (Narvai, et al, 2009).

For citizens

- Adult people should regard healthy dentition as an integral part of good general health.
- The students must have regular opportunities to perform screening dental examination and oral self-care should be acknowledged from childhood up to adulthood.

For dental professionals

- The dentists should put an emphasis on oral self-care instructions which occur during each patient's visit and treatment, especially for those who are with low oral hygiene status.
- Preventive systems should be highlighted in continuing education and during curriculum revision.
- Proper techniques of teeth brushing and flossing must be explained and demonstrated on models at health centers and schools .One needs to emphasize that teeth brushing should not only be performed in the morning and evening bed-time but also after meals or snacks.

For policy-makers

- National oral health prevention programmes should be introduced widely, with the priority that may give to those who are with low oral hygiene status.
- Oral health care should be integrated with the other health care promotion programs, employing the common risk factor approach.
- The strategic plan for a comprehensive oral health care system in Palestine should be always revised and renewed for better innovation. The composition and distribution of dental professionals should be rearranged to cover the different areas equally in the rural and urban areas of Palestine.

- Coverage of dental insurance and school-based of oral health-promotion programmes are in need of development and reevaluation.

- Dental insurance should place an emphasis upon preventive services for periodontal treatments needs and for dental prophylaxis and scaling.

- For more innovative of the prevention aspects of the dental care system in Palestine, the health insurance scheme should include regular dental check-ups.

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Appendix (1)

بسم الله الرحمن الرحيم

جامعة القدس

كلية الدراسات العليا

معهد الصحة العامة

برنامج الصحة العامة

إستمارة
أخي الطالب :
تقوم الباحثة بإجراء دراسة بعنوان
" <u>أمراض دواعم الأسنان لدى الطلبة البالغة أعمارهم 15 سنة في مدينة نابلس</u> "
وذلك ضمن متطلبات الدراسات العليا في برنامج الصحة العامة . جامعة القدس .
بهدف الكشف عن حالات أمراض دواعم الأسنان ومؤشرات اختطا ره بين طلبه المدارس لتقييم مدى امتداد مثل هذه الأمراض وربط هذه الأمراض مع العوامل والمسببات الممكنة لها وبالتالي التفكير بالحلول المناسبة للتقليل من هذه الأمراض التي تقود إلى صحة الفم والأسنان .
الرجاء الإجابة على أسئلة الاستمارة بكل صدق وموضوعية، علما بأن المعلومات التي سيتم جمعها سوف تستخدم فقط لأغراض البحث العلمي ، وستعامل بسرية تامة .
وشكرا لتعاونكم

بإشراف : د . زياد عابدين   الطالبة : سرى إبراهيم كزلك

<u>أولاً : خلفية المبحوث :</u>

1 .اسم الطالب / ة :.................................... .

2 . اسم المدرسة : ....

3 – الجنس :   أ. ذكر ☐ ب. أنثى ☐

4. نوع المدرسة: أ.حكومية ☐ ب.خاصة ☐

5. نظام التعليم في المدرسة :   أ.غير مختلط ☐ ب.مختلط ☐

ثانياً : محاور الدراسة :

المحور الأول : العائلة :

في هذا المحور سوف نسألك عن الأشخاص الذين يسكنون معك في البيت

A.1) من يسكن معك في البيت؟ (أشر إلى خانة واحدة في كل سطر) –

لا	نعم		
☐	☐	أمك	1.
☐	☐	أبوك	2.
☐	☐	تعيش في ملجأ أو بيت للأيتام/بيت داخلي	3.

A.2? كم أخ وأخت يسكنون معك في نفس البيت –

☐ 3. 2   ☐ 2. 1   ☐ 1. أنت فقط

☐ 6. 5 أو أكثر   ☐ 5. 4   ☐ 4. 3

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A.4 - هل لوالدتك عمل؟	A.3 - هل لوالدك عمل؟
🞏 1. نعم	🞏 1. نعم
🞏 2. لا	🞏 2. لا، لكنه يبحث عن عمل
🞏 3. لا اعرف	🞏 3. لا أعرف
🞏 4. لا ألتقي بأمي بتاتا	🞏 4. لا ألتقي بأبي بتاتا

A.6- ما هو تحصيل والدك العلمي؟	A.5- ما هو تحصيل والدتك العلمي؟
🞏 1. لم يُنهي المدرسة الثانوية	🞏 1. لم تُنهي المدرسة الثانوية
🞏 2. أنهى الثانوية (التوجيهي)	🞏 2. أنهت الثانوية (التوجيهي)
🞏 3. أكمل دراسته بعد المدرسة الثانوية ولكن دون مستوى البكالوريوس	🞏 3. أكملت دراستها بعد المدرسة الثانوية ولكن دون مستوى البكالوريوس
🞏 4. يدرس في الجامعة أو تخرج منها	🞏 4. تدرس في الجامعة أو تخرجت منها

A.7- حسب رأيك، ما هو الوضع الاقتصادي لعائلتك؟

🞏 2. جيد   🞏 1. جيد جداً

🞏 4. ضعيف   🞏 3. متوسط

المحور الثاني : عادات التنظيف :

B.1 – هل تنظف أسنانك عادةً ؟

☐ أ. نعم   ☐ ب – لا

* إذا كانت الإجابة في السؤال السابق (لا) ، أذهب إلى سؤال B.3 في الصفحة التالية

B.1.1 – إذا كنت تنظف أسنانك ، فكم مره في اليوم تنظف أسنانك؟

☐ أ– مره واحده يوميا أو أقل   ☐ ب–مرتين يوميا

☐ ج–أكثر من مرتين في اليوم

B.1.2– إذا كنت تنظف أسنانك ، فمتى يكون ذلك ؟(يمكنك اختيار أكثر من أجابه)

☐ أ–في الصباح   ☐ ب–بعد تناول طعام الغداء

☐ ج–قبل النوم   ☐ د–في أحيان أخرى (أذكرها)–––––

B.1.3– إذا كنت تنظف أسنانك ، فكم من الوقت تستغرق في تنظيف أسنانك؟

☐ أ – دقيقه أو أقل   ☐ ب–دقيقتين

☐ ج–أكثر من دقيقتين   ☐ د–لا اعرف

B.2 – كم مره تنظف أسنانك مستعملا خيط الأسنان؟

☐ أ– مره واحده يوميا أو أقل   ☐ ب –أكثر من مره في اليوم   ☐ ج –لا
استعمل خيط الأسنان أبدا

B.3 – هل قمت بزيارة طبيب الأسنان (على الأقل مرة واحدة) في حياتك :

☐ أ. نعم   ☐ ب– لا

* إذا كانت الإجابة في السؤال السابق (لا) ، أذهب إلى المحور الثالث في الصفحة التالية

B.1.3– إذا كنت تقوم بزيارة طبيب الأسنان ، كيف يحدث ذلك ؟

☐   ☐ أ–مره أو مرتين بالسنة (بصوره منتظمة)   ☐ ب–أحيانا

☐ ج–عندما يكون عندي الم في الأسنان

B.2.3–إذا قمت بزيارة طبيب الأسنان ، متى كانت أخر مره :

☐ أ–قبل 6 أشهر   ☐ ب–قبل 6–12 شهر

☐ ج–قبل سنه–سنتين   ☐ د–قبل 2–5 سنوات

☐ ه–قبل أكثر من خمس سنوات

B.3.3–– إذا قمت بزيارة طبيب الأسنان ، ما سبب زيارتك عاده:

☐ أ–أوجاع   ☐ ب–توصيه من صديق أو قريب

☐ ج–توصيه من طبيب أسنان أخر   ☐ د– الكشف على أسناني

☐ ه–تنظيف أسناني واللثة   ☐ و –سبب أخر(يرجى تسجيل)---------

المحور الثالث : التغذية وعادات تناول الطعام

C.1 – كم مرة في الأسبوع تتناول عادةً وجبة <u>الإفطار</u> (أكثر من كأس حليب أو شاي أو عصير فواكه)؟

الرجاء الإجابة بما يتعلق <u>بأيام الأسبوع</u> وأخرى تتعلق <u>بالعطلة الأسبوعية</u> بوضع دائرة حول الحالة التي تنطبق عليك <u>:</u>

	C.2.1 <u>في العطلة الأسبوعية</u>		C.1.1 <u>في أيام الأسبوع</u>
☐ 1.	ولا مرة أتناول وجبة الإفطار في العطلة الأسبوعية	☐ 1.	ولا مرة أتناول وجبة الإفطار في أيام الأسبوع
☐ 2.	عادةً أتناول وجبة الإفطار في أحد أيام العطلة الأسبوعية	☐ 2.	في يوم واحد
☐ 3.	عادةً أتناول وجبة الإفطار في يومي العطلة الأسبوعية	☐ 3.	في يومين
		☐ 4.	في 3 أيام
		☐ 5.	في 4 أيام
		☐ 6.	في 5 أيام
		☐ 7.	في 6 أيام
		☐ 8.	في 7 أيام

C.2 – كل كم من الوقت أنت تأكل أو تشرب الأشياء التالية :

(أشر إلى خانة واحدة بوضع إشارة (×) تحت الحالة التي تنطبق عليك في كل سطر) :

أكثر من مرة واحدة في كل يوم	مرة واحدة في كل يوم	6 مرات في الأسبوع	2-4 مرات في الأسبوع	مرة واحدة فقط في الأسبوع	أقل من مرة في الأسبوع	لا أتناولها أبداً	الفقرة	الرقم
							فواكه	C.1.2
							خُضراوات	C.2.2
							حلويات (امثل ملبس أو شُوكُلاتة)	C.3.2
							كـــولا أو مشـــروبات خفيفــة تحتــوي على سكر	C.4.2
							حليب	C.5.2
							لحوم أو دجاج	C.6.2
							ماء	C.7.2

C.3 - أيّ من الأشياء التالية قمت بتنفيذها في الـ 12 الأشهر الأخيرة <u>من أجل مراقبة وزنك</u>؟ (أشر إلى خانة <u>واحدة</u> بوضع إشارة (×) تحت الحالة التي تتطبق عليك في كل سطر) :

لا	نعم	الفقرة	الرقم
		قُمتُ بنشاطات رياضية	C.1.3
		بشكل عام، أكلتُ أقل (أي كميات أقل)	C.2.3
		تناولت حلويات أقل	C.3.3
		تناولت مأكولات دسمة أقل	C.4.3
		أكلتُ فواكه أو خضروات أكثر	C.5.3
		شربت مشروبات خفيفة مع سكر أقل	C.6.3
		شربت ماء أكثر	C.7.3
		قيدت نفسي بنوع معين من فئات الطعام (مثلاً، فقط فواكه وخضار، شربت فقط، تناولت فقط الخبز والماء)	C.8.3
		قمت بإتباع حمية غذائية تحت إشراف مهني	C.9.3
		لم أتناول بعض الوجبات	C.10.3
		صُمتُ (ليس لغاية دينية)	C.11.3
		تقيأتُ	C.12.3
		تناولت أقراص لتخفيف الوزن أو أدوية مُسْهِلة	C.13.3
		دخنت أكثر	C.14.3
		آخر، حدد _____	C.15.3

المحور الرابع : التدخين

D.1 – هل حدث أن دخنت سجائر بالماضي ؟ (على الأقل سيجارة واحدة)

☐ 1. نعم   ☐ 2. لا

D.2– كم مره تدخن <u>حاليا</u> سجائر أو منتجات التبغ؟ (أشر إلى خانة <u>واحدة</u> فقط)

☐ 1.   كل يوم

☐ 2.   على الأقل مرة في الأسبوع، ولكن ليس بشكل يومي

☐ 3.   أقل من مرة في الأسبوع

☐ 4.   أنا لا أدخن

* إذا كانت الإجابة في السؤال السابق (لا أدخن) ، أذهب إلى سؤال D.3

D.1.2 – إذا كنت مدخناً للسجائر، في أي عمر بدأت بتدخين سيجارة لأول مرة (أكثر من نفخة واحدة)؟

العمر   ☐☐

D.2.2 – إذا كنت مدخناً للسجائر ، كم سيجارة تُدخن عادة في الأسبوع؟

1. إذا كنت تدخن أقل من سيجارة في الأسبوع ، رجاءاً سجل (0   )

الإجابة :   ☐☐

2. إذا كنت تدخن أكثر من سيجارة في الأسبوع ، رجاءً اكتب عدد السجائر في الأسبوع

الإجابة :   ☐☐

D .3 – هل حدث بالماضي أن دخنت أرجيلة؟

☐ 1.   نعم   ☐ 2.   كلا

D. 4– كم مره تدخن اليوم أرجيلة؟

☐ 1.   كل يوم

☐ 2.   على الأقل مرة في الأسبوع، ولكن ليس بشكل يومي

☐ 3.   أقل من مرة في الأسبوع

☐ 4.   أنا لا أدخن الأرجيلة

انتهت

Appendix (2)

Name of the student: other date:

Sex (M=1,F=2)

Periodontal status (CPITN)

0=healthy

1=bleeding.

2=calculus.

X=excluded sextant.

Oral hygiene status(OHIS)

0=no debris

1=debris on the one third of the tooth surface.

2= debris on the two thirds of the tooth surface.
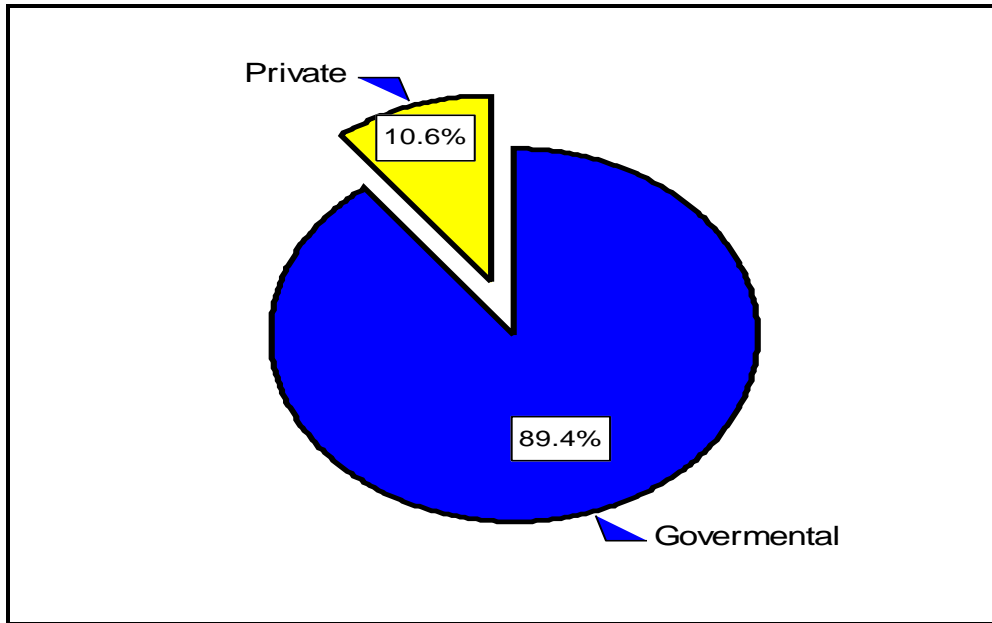
3=debris on the all tooth surface.

Fig 5.1: Distribution of the study sample by the type of school

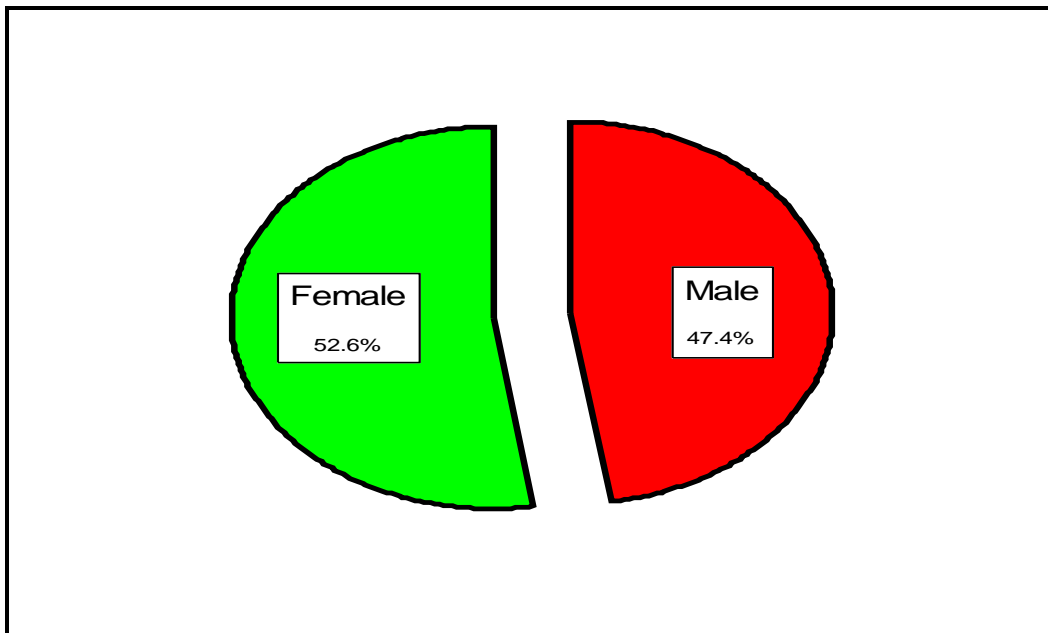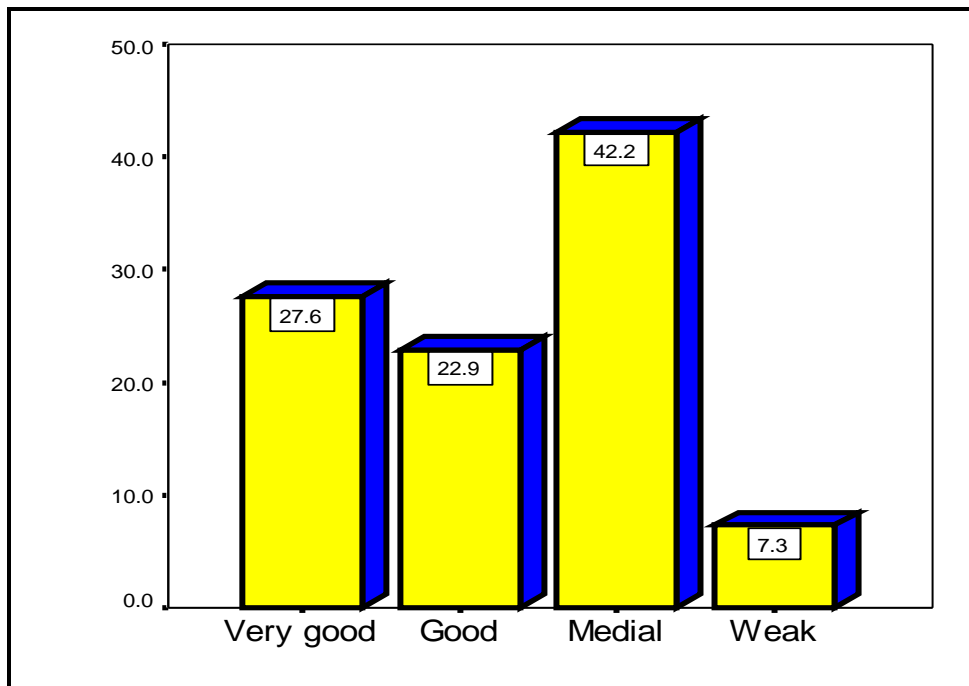**Fig 5.2: Distribution of the study sample by sex**

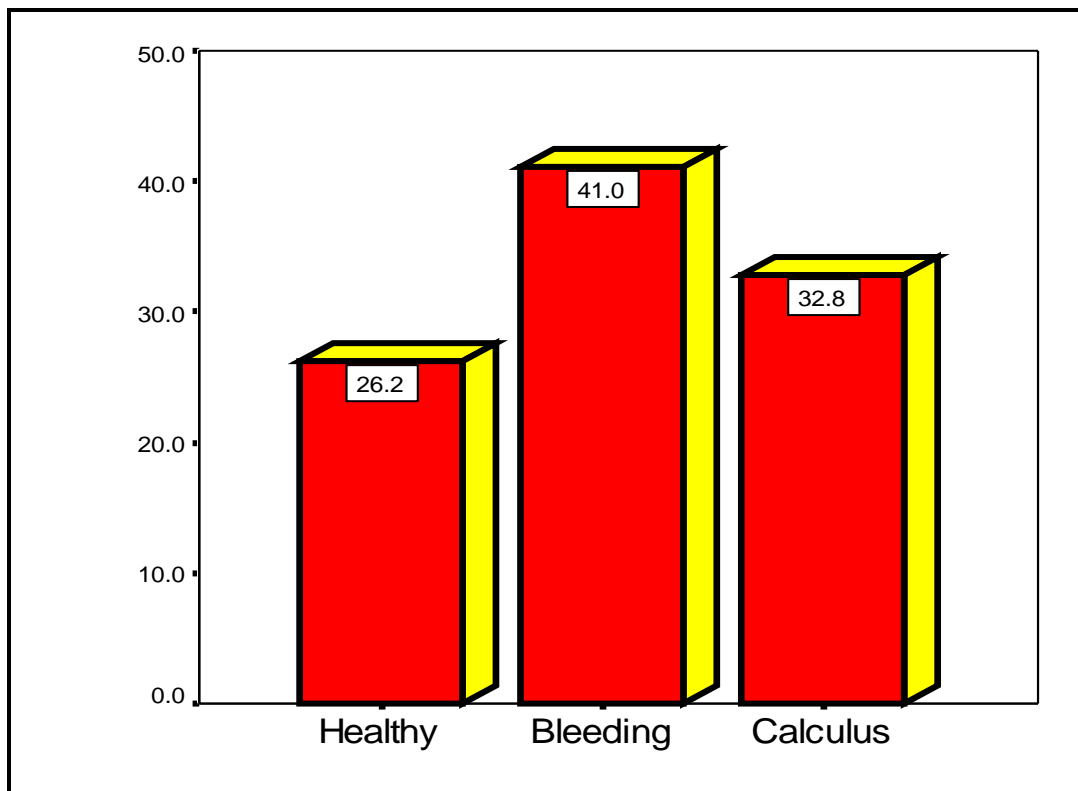**Fig 5.7: Distribution of the participant students according to their economic status**

Fig 5.19: Distribution of participant students according to their periodontal status
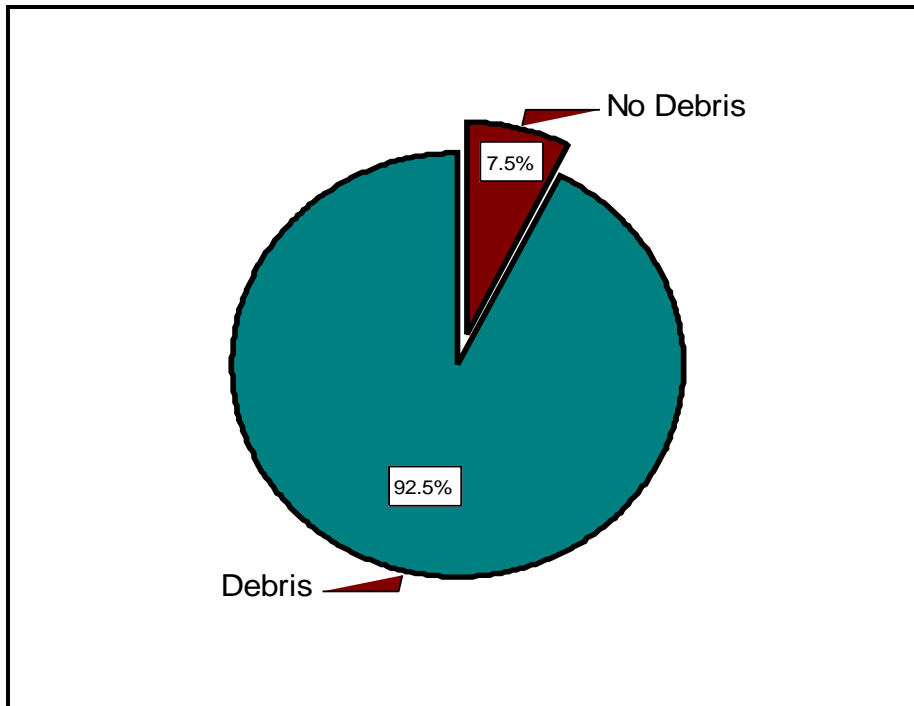
Fig 5.23: Distribution of the participant students according to their oral hygiene status

Appendix (6)

The list of schools' names which were sampled in the present study

School's name	School's type	School's system
Abu-Baker Al-Sedaik	Governmental	Males
Al-Rahbat	Private	Mixed
Al-Rawda college	Private	Males
Bait wazan	Governmental	Mixed
Dafher Al-Masri	Governmental	Females
Ibn Qutaiba	Governmental	Males
Ma'azooz Al-Masri	Governmental	Females
Sarem Aldain AlNajmi	Governmental	Males
Tufaha	Governmental	Females

Appendix (7)

Purpose: To use the Gingival Index (GI) of Loe and Silness to evaluate the degree of gingivitis in a patient.

data   enter

Are you evaluating the extent of gingivitis involving a person's teeth? (Y or N)

Y	:-):-):-)

enter an "x" in the appropriate column for each tooth surface (give only 1 answer per row)

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal			x		Yes2
						0
maxillary right first molar	lingual		x			Yes1
						0
	mesial				x	Yes3
						0
	distal			x		Yes2

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal		x			Yes1
						0
maxillary right lateral incisor	lingual		x			Yes1
						0
	mesial	x				Yes0
						0
	distal			x		Yes2

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal	x				Yes0
						0
maxillary left first bicuspid	lingual		x			Yes1
						0
	mesial			x		Yes2
						0

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		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	distal			x		Yes2

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal				x	Yes3
						0
mandibular left first molar	lingual				x	Yes3
						0
	mesial				x	Yes3
						0
	distal			x		Yes2

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal			x		Yes2
						0
mandibular left lateral incisor	lingual			x		Yes2
						0
	mesial			x		Yes2
						0
	distal			x		Yes2

		no inflammation	mild inflammation	moderate inflammation	severe inflammation	
	buccal		x			Yes1
						0
mandibular right first bicuspid	lingual		x			Yes1
						0
	mesial		x			Yes1
						0
	distal	x				Yes0

calculate	result	
data complete?	Yes	
evaluation appropriate?	Yes	:-):-):-)
Gingival Index for		
• maxillary right first molar	2.0	
• maxillary right lateral incisor	1.0	

• maxillary left first bicuspid	1.3
• mandibular left first molar	2.8
• mandibular left lateral incisor	2.0
• mandibular right first bicuspid	0.8

Gingival Index for	
• the first molars	2.4
• the first bicuspids	1.0
• the lateral incisors	1.5
Gingival Index for the patient	1.6

indicating moderate inflammation

"مدى انتشار أمراض دواعم الأسنان بين طلاب المدارس الذين أعمارهم 15 سنه في مدينه نابلس"

أعداد: سرى إبراهيم كزلك

أشراف: الدكتور زياد عابدين

ملخص:

أمراض دواعم الأسنان هي مشكله صحية كبرى في معظم دول العالم وفي العديد من الدول العربية ،وتزداد هذه الأمراض مع الوقت أكثر بين الدول النامية .لقد وضعت عده عوامل لشرح الاختلاف في تقييم مدى انتشار أمراض دواعم الأسنان عامه،ومع التطور المستمر والتغيير الحاصل في طريقه الحياة في فلسطين،عادات تنظيف الأسنان والعادات الخاصة بالتغذية والتي ظهرت مؤخرا والتي بدورها لها تأثير على مدى انتشار أمراض دواعم الأسنان.وفي ظل قله الدراسات التي تخص صحة الفم والأسنان بين المواطنين ،هذه الدراسة تهدف إلى تسليط الضوء على مشكله أمراض دواعم الأسنان بين طلبه المدارس الذين أعمارهم 15 سنه في مدينه نابلس.

هذه الدراسه دراسة مقطعيه بطبيعتها وقد أجريت من الفترة من 15\11\2010 إلى 30\12\2010. جميع التلاميذ في الصفوف المذكورة تم مقابلتهم لتعبئه الاستبانه ألمعده للدراسة والتي تتضمن اسئله عن وضع الطلاب الاجتماعي الاقتصادي وحول عادات تنظيف الفم والأسنان والعادات الغذائية وعادات التدخين.

كما انه تم الفحص الطبي للعينة المختارة لتحديد حاله اللثة وذلك من قبل طبيبه أسنان مدربه وباستعمال مراه الأسنان وتحت ضوء النهار حسب معايير منظمه الصحة العالمية.

وقد تم قياس مؤشرين رئيسين في هذه الدراسة (CPITN, SOHI) وقد تم دراسة العلاقة بين هذه المؤشرات.

نتائج هذه الدراسة أظهرت أن (73.8%) من الطلاب المفحوصين لديهم مشاكل في لثتهم منهم (41.0%) لديهم مشاكل نزيف في اللثة و(32.8) لديهم تكلسات على اللثة والأسنان وهذا يعني تقريبا أن ثلثين ألعينه المؤخوذه من الطلاب تحتاج لعلاج وتنظيف اللثة.وأظهرت النتائج أيضا وجود علاقة وثيقة بين مؤشر نظافة الفم (SOHI) ومؤشر حاله اللثة (CPITN) حيث كانت قيمه معامل بيرسون =(0.399) . لذلك يجب اتخاذ خطوات مهمة من اجل زيادة المعرفة بطرق العناية بالأسنان واللثة والإجراءات الوقائية في المدارس والمجتمع.

أيضا الحالة العملية للام كان له دلاله احصائيه طرديه مع حاله اللثة عند الطلاب (0006= p) ,بمعنى انه الأمهات اللواتي لديهن عمل كانت لثة الأبناء أحسن بالمقارنة مع لثة الأبناء الذين أمهاتهم ليس لديهن عمل , بينما لم تكن هناك علاقة احصائيه بين ألحاله ألعلميه للأب مع حاله اللثة عند الطلاب وهذا يقود إلى أن السياسات التربوية والصحية ربما تكون أكثر فاعليه أذا ماوصلت إلى المجتمع من خلال الأم .

كذلك الدراسة بينت وجود دلاله احصائيه بين حاله اللثة وعاده (كميه) تناول اللحوم (p=0006) وقد وجد أيضا أن نسبه عاليه من الطلاب يتناولون نسبه عاليه من السكريات وهذا يقودنا إلى أن الإجراءات الوقائية يجب أن تشمل الإقلال من تناول المواد السكرية وزيادة تناول اللحوم والفواكه .