PREVALENCE OF DENTAL CARIES AND ITS ASSOCIATED RISK FACTORS AMONG LIBEN PRIMARY SCHOOL STUDENTS ABOVE 12 YEARS OLD, WOLISO TOWN, SOUTH WEST SHOA

BY:- GETU ABEBE (DENTAL INTERN)

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JIMMA, ETHIOPIA

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ADVISOR:- Dr. FIKIRTE AKLILU (DMD)

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ABSTRACT

Background:- Dental caries is a progressive disease leading to destruction of the hard tissues of the teeth. The rapidly changing disease patterns throughout the world are particularly linked to change in life style which includes diets rich in sugar, wide spread use of tobacco and increased consumption of alcohol. Caries and painful teeth may cause malnutrition in children due to difficulty in mastication. They could even present a major aesthetic and psychological problem for some patients.

Objective:- To determine the prevalence of dental caries and to assess the relationship between dental caries and its associated risk factors among Liben primary school students.

Methods:- A cross- sectional study will be conducted to determine prevalence of dental caries and its associated risk factors among Liben primacy school students above 12 years old, Woliso town, South West Shoa. The study was conducted on sample population of students who were selected by simple random sampling technique from 1400 source population. The data will be collected by structured question format through self administered questionnaire. The data will be processed, analyzed by software. The results will be presented using numbers, graphs and tables. Different statistical tests like P-value and chi square tests will be done to associate different variables.

Results;- A total of 272 subjects were participated in the study with male to female ratio of 1 to 1.34.There was a high prevalence of dental caries among the study subjects.Only 57% of them were caries free.There is statistically significan association between dental caries and age,habit of tooth cleaning,frequency of tooth cleaning,type of cleaning material,time of cleaning,consumption of sugared foods,type of sugared containing food,frequency of consumption and students who rinse their mouth after consumption of sugared food with a p-value of 0.001,0.00,0.00,0.00,0.00,0.000.001,0.001,0.000 respectively.

Conclusion and Recommendation:- The prevalence of dental caries among the study subjects was high.Conducting proper sample sized study and initiating preventing activities such as promoting awareness on oral health to the students were some of the recommendations.

Key terms:- Dental caries, sugar in take, fluoride exposure, oral hygiene practice.

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ABBERVIATION

DM:- Diabetes Mellitus

DMFT:- Decayed, missed & filled permanent tooth

dmft:- decayed, missed & filled deciduous tooth surface

dt:- decayed deciduous tooth

FT:- Filled permanent tooth

PI:- Principal Investigator

S.mutans:- Streptococcal mutans

WHO:- World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Back ground

Dental caries is process that may take place on any tooth surface in the oral cavity where dental plaque is allowed to develop over period of time.

Caries has been defined in many ways in the literature, modern evidences reveals that there is a continuum of disease states ranging from subclinical subsurface changes to more advanced clinical detectable subsurface caries to various stages of more advance lesion with microscope and later microscopic cavitations of enamel and significant involvement of dentin.

The burden of suffering from dental caries is a common phenomenon and it finds across all socioeconomic strata. It is a common oral disease in children.

Three factors are required for caries to exist; cryogenic bacteria, fermentable carbohydrate and susceptible tooth surface.

There are a number of organisms normally present in plaque which can cause caries. These cariogenic bacteria can;

- Transport sugars and convert them to acid (acidogenic)
- Produce intracellular and extracellular polysaccharides which contribute to the plaque matrix
- Thrive a low PH (acidogenic). some of the bacteria are capable of fermenting dietary carbohydrate substrate (such as the sugars, Sucrose and glucose) to produce acid, causing the plaque ph to fall to below 5 within 1-3 minutes. Repeated falls, in ph may in time results in demineralization of the tooth surface. Experimental studies have confirmed that s.mutans are the most potent cariogenic bacteria which can produce ph low enough to decalcify tooth surface (lower than 5 ph) and also rapidly produce lactic acid from sucrose which can cause greater fall in PH.

Bacterial plaque is the essential precursor of caries and for this reason sits on the tooth surface which encourage plaque retention and stagnation are particularly prone to progression of lesion. These sites are:-

- In pits and fissures & occlusal surfaces of premolars and molars, buccal pits of molars and premolars and palatal pits of maxillary incisor.
- Smooth surface just cervical to the contact point
- The enamel of the tooth just coronal to gingival margin
- In patients where periodontal disease has resulted in gingival recession the area of plaque stagnation is on the exposed root surface.
- The margin of restoration particularly those that are deficient or over hanging restoration

carbohydrates are the only components of diet that could cause caries because they are the main component up on which oral bacteria produce organic acid. This acidogenecity of carbohydrates is determined by type of carbohydrate taken, amount & frequency of carbohydrate intake. Although great international and regional difference exists, the incidence and the prevalence of dental caries have been declined in the industrialized countries over the past 20-30 years but its prevalence and incidence increase in developing countries due to increased consumption of sugars & inadequate exposure to fluorides.

1.2. Statement of the problem

Dental caries is one of the common oral diseases which hinder the achievement and maintenance of oral health. Dental caries is an infectious disease which is caused by acid producing s. mutans and lactobacillus bacteria. These affect all are groups, not only children.

WHO painted that the global problems of oral diseases still persists despite great improvements I the oral heath of populations in several countries. WHO also claimed that poor oral health may have a profound effect on general health as well as quality of life, and several oral diseases are related to chronic disease.

Oral disease quality as a major public health problems due to these high prevalence and incident in all regions of the world and as for all diseases the greatest burden of oral disease on the disadvanced and socially marginalized population. the severe impact in terms of pain and suffering impairment of function and the effect on quality of life must also be considered. Furthermore, oral diseases restrict activities at school, at work and at home causing million of school and work hour to be lost each year throughout the world.

At present the distribution and severity of dental caries vary in different parts of the world and within the same country or region.

Also a most prevalent oral disease in several Asian and Latin American countries. However, it is expected that the incidence of dental caries will increase in the near future in many developing countries (20)

The three major factors in dental caries are diet, microorganisms and susceptible tooth structures which were identified several years ago. Since then large number of local and general risk factors have been added. Diet has taking a large share in contributing forward major oral disease (i.e. caries process).

Statistics from WHO global oral data indicate that in many developing countries the prevalence of dental caries is rising rapidly. For instance in India , it is believed that the prevalence of dental caries is

relatively more frequent in urban than rural areas and that oral disease are related to economic, education, environmental status, types of diet, life style and lack of knowledge about oral health. Nowadays, as a consequence of high prevalence of dental caries the treatment need is increasing. However, treatment cost for dental disease is normally high. Traditional treatment of oral disease is extremely costy in several industrialized countries and not feasible or possible to most low income and middle income countries. The treatment is estimated to account for between 5-10% of health cost in industrialized countries. In USA annual treatment costs are estimated to be at least 4.5 billion dollar(23) The problem of dental caries is exaggerated in children with poor family, elderly people, people without dental insurance, mentally ill people, medically compromised and homeless people.

In developing countries (2) the availability of dental care is almost nonexistent and the caries experience is higher in the cities than in the rural (21). In newly industrialized countries there is evidence of increasing rates of caries in the children and adults as well. In developed countries where the availability of dental service coupled with a more preventive and maintenance approach has lead to decrease in the DMFT scores and greater number of retained tooth.

In Africa the dentist to population ratio is approximately in 1:150,000 against about 1:20,000 in most industrialized countries and while we have made a limited progress in reducing tooth decay among younger people in the developing world, for many older people it remains a major source of pain and ill health (20)

Despite efforts to promote and organize the oral health, and the adoption of relevent resolution at the WHO assembly and regional committees over recent years, oral health is still not an integral part of existing health services, even at the important primary health care level.

In Ethiopia where access to oral health service is limited in some hospital and private clinics which mainly located in Addis Ababa. These existing dental clinics are mainly concentrate on curative and restorative services that don't reduce overall prevalence of oral health problem. In Ethiopia painful teeth are left untreated or extracted traditionally in most populations. So, the prevalence of dental caries can't be found in hospitals or clinics, rather it is found by going and asking the community. Therefore, this study will be done to assess the prevalence of dental caries and associated risk factors among Liben primary school students and to recommend responsible bodies and organizations to prevention and management of existing dental caries in the community.

CHAPTER TWO

LITERATURE REVIEW

Dental caries is a bacterial infectious disease which causes the destruction of the hard parts of a tooth. It is mediated by physico chemical flow of water dissolved ion. Oral micro organisms when organized in masses as dental plaque on tooth surface, hydrolyze starches and metabolize sugars to form organic acids which slowly and intermittently dimineralize the hard calcified tissue (3).

In Almata conference in 1978, WHO informed that the percent of population affected with dental caries in the world was very high (90%). They began to work for programme for dental health care (26). But, until now this programme has depended on socio economic status, and ability of each country. Therefore, the result of these programme been varied (1).

Dental caries affects all human irrespective of location and country, nation, race or color. Though the disease is often considered as, a result of modernization, data indicate that developing countries have also become victims (4).

The DMFT index of < 1.1 is considered as very low, 1.2 – 2.6 as low, 2.7 – 4.4 as moderate, 4.5 – 6.5 as high and above 6.5 is considered as very high. But it varies from country. In 1960's the index average was less than one for most third world countries, but figures in 1993 shows sharp reversal of trends 2.08 for developing countries and 3.1 for developed countries.

There are accountable reasons for the rapidly raising of dental caries in developing countries (19) this are; inappropriate dental curriculum in African set up, few oral cares personnel and an imbalance between personal and population needs, rural and peri urban communities without basic care or without emergency care, due to the high cost or unavailability of other treatment, low priority given to oral health care due to the prevalence of several general health problems & enormous development needs and low awareness of oral health by the population (18)

WHO carried out several surveys to evaluate the prevalence of tooth decay all over the world using standardized surveys and index (123) which describes the prevalence of dental caries in an individual & is obtained by calculating the number of decayed (D) Missed (M) & filled (F) teeth. The WHO goal time indicates that a maximum of 3 teeth as a mean may be affected by the age 12. However, a low mean caries level such as 3.0 doesn't exclude a number of individuals with considerable high DMFT values in the same population (13).

WHO in 2005 reported that dental caries experience in children is relatively high in the American (DMFT = 3.0) & the Europeans (DMFT = 2.6) where as the index is lower in most African countries (DMFT = 1.7).

In most developing countries the level of dental caries were low until recent years, but the prevalence rate of dental caries and dental caries experience are now tending to increase. The main reason for this trend is the increasing consumption of sugars and in adequate exposure to fluoride. In contrast a decline

has been observed in most developed countries over the past 20 years. This result was explained by the effectiveness of fluoride together with changing living conditions, life style and improved self care protection (20).

About 60- 90% of school children worldwide suffers from dental caries, severe gum disease and is found in 5 -20% of middle aged adults (11). At global level rapid changes in pattern of oral disease have been noted during the past decade (15, 16).

By the age of 17, 78 % of young Americans have had a cavity and 7% have lost permanent tooth. In adult between the age of 35 & 44, 69 % have lost at least one permanent tooth.

Dental caries experience is strongly age related, There is often an increase in severity and prevalence with increased age (9).

As study done on the prevalence and distribution of caries in the 12 – 15 years urban children in Nigeria showed that out of 353 students, 24.1% had caries. The total mean DMFT was 0.45 + 0.53 with a DMFT of 0.35 and 0.54 in males and females respectively. Caries was most prevalent in the first molar (46.5%) while canine and first premolars were caries free (14).

A study done in Kenya in February 2004 showed that out of 141 sample subjects 56.7% were caries free while 43.3% had caries experience. The percentage of females with caries was higher than that of males, of these with caries, 72.1% were women and 27.9% were men. Among whom the 35-44 age groups were the most affected (17).

On a study done in east Africa Urban children (in Nairobi and Dare Selam) to get a base line data on caries prevalence showed that out of 762 children at the age of 12, the mean DMFT was 0.67 in dare Selam, Tanzania and out of 802 samples in Kenya, Nairobi of the same age group the DMFT was 0.51, which was very low according to WHO DMFT level at age of (12).

A study from 39 African countries in 2005 showed that the DMFT among of 12 years old is very low 13 (33%) countries, low 19 (49%), and moderate in 7(18%). Most this represents untreated caries and reflects the inadequacy of the response to the problem by current oral health services. (9)

A study done on oral status of school children Uganda, Showed that the mean DMFT was 1.5 (+0.85) with females had higher DMFT index (1.6 + 0.85) than males (1.3 + 0.85), dt was 2.7 but more in female (3.1) than in males. (19).

A study done on Ethiopia emigrants from Jerusalem in 1994 showed that mean DMFT was 0.33 at the age of 12 and 2.46 at the age above 51. The prevalence has age related, 45% of (13-20 years), 67.2% (21-50 yrs) and 83.3% of above 51 years have caries (7).

A study on Ethiopia immigrants in to Jerusalem in 2008, showed that 70.10% of the examines were caries free as compared to 57 .3% after 5 yrs, DMFT had increased from 1.48 to 2.31. (16)

In a study done in 1985 on dental caries prevalence in a rural high land community in North Ethiopia among 815, 5 years old children the prevalence of dental caries was 47.81. Low rate were detected among those who used the local brush, high prevalence were shows in individual with poor oral hygiene (8).

One cross-sectional study (13) assessed the association between oral hygiene and dietary factors and dental caries in 12-13 years old children Korea, they didn't find any significant association between cavitated caries experience and the following variables; tooth brushing frequency and sugar in take frequencies between meal. On the other hand Weissen bacetal (25) assessed the association of caries lesion and DMFS with tooth brushing frequency and sugar consumption in 12-24 years old children in India. They found that sugar consumption and tooth brushing frequency were significantly associated with dental caries/ lesion.

A number of studies in recent decades have emphasized the positive effects of healthy behavior of individuals on improving oral health in general as well as dental health in specific (16). Vehkalani conducted a study in 1998 to find out if there is a relationship between the occurrence of caries and subjects dental habits, such as the frequency of tooth brushing, the avoidance of sugar and regularity of dental visit. The result shows that a high frequency of tooth brush was strongly related to a low occurrence of caries for both male (OR =4.3, P value $P < 0.005$) and women (OR = 4.5, P value < 0.001) (21).

Once study on the association between dental caries and socio economic status in Saudi shows that socio economic status and DMFT in children have inverse relationship. Mothers of the higher class have higher preventive care awareness and accompany their children regularly to visit a dental at any early age(1).

The socio behavioral risk factors have been found to play a significant roles in the occurrence of dental caries in both children and adults worldwide (20). Other social factors related to dental caries were also concluded in bastos study that low level of maternal schooling, and low monthly family income were statically associated with dental caries (5). On the other hand Browns study indicated that there was no difference of DMFT between 6-18 years who were at or below the poverty level and those above the poverty level (DMFT = the former and 1-89 for the latter(6). Older children (12-18 years) exhibited more caries than their younger counter parts whose age was from 6-11 years, their DMFT permanent teeth are 6.65 and 1.67 respectively.

A cross sectional study done in West bank in 2005 shows that there is no significant association between frequency of brushing and DMFT category (P value = 0.9510). The proportion of non zero DMFT (DMFT>0) among those who brushed their teeth more than twice a day is not much difference among those who didn't brush. The researcher also shows that there was significant association between unfixed brushing behavior, brushing after getting up and DMFT category (P value = 0.38 for the former & P Value = 0.27 for the latter). In those who didn't brush their teeth regularly the prevalence of non zero DMFT score was higher (88.5) than on those who did (69.2). Students in brush after getting up group had lower non zero DMFT score (67.9) prevalence than not brush after getting up groups (81.1)(7)

2.2 Significance of the study

Dental caries is the most common disease of the oral cavity affecting many people in the world. The prevalence is remarkably increasing in Ethiopia mostly due to the changes in our dietary habits. Despite this fact there is very little intervention being applied to solve the problem. In Liben there is no a base line data about dental caries prevalence, so this study will be conducted and DMFT, dmft of the area will be determined and the information obtained will be used by public health workers and health planners to implement dental caries preventive measures. It will also serve as a base line for other dental researchers and forward appropriate recommendations to concerned bodies.

CHAPTER THREE

OBJECTIVE

1. General objective

To assess the prevalence of dental caries and its associated risk factors among Liben primary school students above the age of 12 years old.

2. Specific objective

- To determine the prevalence of Decayed, Missed & Filled teeth among Liben primary school students at a given age group.
- To correlate the prevalence of dental caries with the level of oral hygiene practice among Liben primary school students.
- To correlate the prevalence of caries with the pattern of dietary habits among Liben primary school students.

- To determine (evaluate) DMFT, dmft, according to socio economic status among Liben primary school students.
- To recommend appropriate caries preventive measures to the responsible body.
- To create base line information concerning caries changes for the coming researchers.

CHAPTER FOUR

METHODOLOGY

4.1 Study area and period

4.1.1 Study area

The study was conducted in governmental school, Liben primary school, Woliso town, South West Shoa. It is located 114 km from Addis Ababa. Woliso has average altitude of 2063m above sea level. According to National population and housing census of Woliso town of 2007 the population of Woliso town was 37,878 of whom 18,880 are males and the remaining are females.

4.1.2 Study period

The study was conducted from June 3/05/2013-13/05/2013.

4.2 Study Design

A cross sectional study on the prevalence of dental caries and its associated risk factors among Liben primary school students above 12 old children.

4.3 Population

4.3.1 Source population

All students of Liben primary school

4.3.2 Study population

All Liben primary school students above the age of 12 years were selected by simple random sampling technique (lottery method)

4.4 Eligibility Criteria

- Inclusion criteria:- all students above the age of 12 were included in the study because it is a time where deciduous tooth are changed by permanent tooth
- Exclusion:- all students below the age of 12 were excluded from the study

4.5 Sample size & sampling Technique

4.5.1. Sample size

From the no of students:-

The sample size was determined by the formula

$$n = \frac{NZ2pq}{d2(N-1)+Z2pq}$$

Where Z= 1.96 precise at 95%

N = Total no of population

P= Prevalence at 50% (0.5)

n = Sample size

Q = 1-p

d= degree of accuracy (margin of error) = 0.05

N =1400 (Total no of students above 12 years old)

Then

$$n = \frac{1400 \times (1.96)2 \times 0.5 \times 0.5}{(0.05)(1400) + 1.96 \times 0.5 \times 0.5}$$

n= 337

And since the total number of students in Liben primary school is less than ten thousand. We use correction formula that is

$$Nf = \frac{ni}{1+\frac{ni}{N}}$$

Where = nf = final sample size

N = Target population

ni = initial sample

$$N = \frac{337}{1+\frac{337}{1400}} = \frac{337}{1.24071} = 271.6 = 272$$

Sample section from the students is calculated as follows by using stratified sampling method

$$Ni = \frac{(Ni)nf}{N}$$

N= Total number of students

Ni= Number of each grade students

ni= Sample size to be determined for each grade

nf= Number of students of the class (grade)

ni (Grade 1 students)

205 X 272 = 40

1400

ni (Grade 2 students)

195 X 272 = 38

1400

ni (Grade 3 students)

192 X 272 = 37

1400

ni (Grade 4 students)

158 X 272 = 31

1400

ni (Grade 5 students)

191 X 272 = 37

1400

ni (Grade 6 students)

159 X 272 = 31

1400

ni (Grade 7 students)

160 X 272 = 31

1400

ni (Grade 8 students)

140 X 272 = 27

1400

Therefore the sample size of grade 1-8 is 40, 38, 37, 31, 37,31,31 and 27 respectively. From the total of 1400 students of Liben Primary School, after sampling 272 students were selected. system random sampling was considered every stratum of students by using the following formula.

Therefore the sampling was taken every 5th interval from each class. From the formula

n/N = 272/1400 = 1.5

The 1st student from the 5th students in each class was selected randomly using a lottery method.

4.6 Sampling technique

Stratified sampling technique will be used to determine the sample size and the sampled students will be selected by (lottery method) is going to be employed.

4.7 variables

4.7.1 Independent Variable

- Age
- Sex
- Family income
- Grade level
- Dietary habits,
- tobacco smoking habits
- Oral hygiene practice
-

4.7.2 Dependent Variables

- Dental caries

4.8 Data collection technique & tools

Personnel; two data collector and one PI was participated in data collection and clinical examination was also done by PI.

4.8.1 Questionnaire

A structured questionnaire with closed ended question was administered to participants. The questionnaire has 6 parts which contains information on demographic, oral hygiene practice, dietary habits, health seeking behaviors, fluoride exposure and tobacco smoking habits. Also clarification was given to the study population in order to handle misunderstanding which was one of the major limitation of self administered questionnaire. The questionnaire were written in English and translated in to the local language (Afan Oromo) for the respondent who doesn't understand English. The record forms was cross checked for errors and completeness after each days field work.

4.8.2. Clinical Examination

The clinical examination was done by the principal investigator by using disposable glove portable torch, wooden spatula and probes in class. Dental caries were assessed by using the DMFT index, which describes the prevalence of dental caries in permanent teeth in an individual. DMFT reflects numerically express of caries prevalence and were obtained by calculating the number of

D= Decayed permanent

M = Missed permanent

F = Filled permanent

For deciduous tooth we use dmft to indicate caries existence.

The missed and filled component indicates those teeth missing or filled as a result of caries. DMFT score will be calculated as follow

$$\text{Mean DMFT} = \frac{Dn + Mn + Fn}{\text{Total member of students examined}}$$

According to DMFT index dental caries is recorded as being present when a lesion in Pit or fissure or on smooth surface has a detectable soft flour, Undermined enamel, soft wall or temporary restoration. It is assumed missing due to dental caries if there was history of pain and presence of a cavity prior to extraction. The prevalent rate of caries can be calculated as;

$$Pr = \frac{\text{No of all cases affected with caries}}{\text{Total population}}$$

The delivery of dental service to a population can be determined by

$$\text{Caries experience index} = \frac{FT \times 100}{DMFT}$$

Where FT = Filled tooth

4.9 Data quality control

The data collection format questionnaire were tested prior to actual study on 10 students of Liben primary school. The principal investigator had an ongoing supervision each day and time during data collection to ensure quality of data by checking filled formats for their completeness and consistency.

4.10 Data Analysis Methods

The data collected were stored, processed & analyzed by using computer soft ware (SPSS Version) and results were presented by using number, percentage and tables.

4.11 Operational Definition

- Cariogenic bacteria- this are bacteria which can produce caries
- Decayed – a tooth which is demineralized by cariogenic bacteria
- Deciduous tooth – a tooth which is primarily erupt on the jaw in children

- Dental caries - Progressive irreversible bacterial damage of the hard tooth structure exposed to the oral environment
- Dental plaque – A dense non-calcified organic matrix that doesn't wash off by salivary flow
- DMFT – The average number of permanent teeth per person which are Decayed, Missed and Filled
- dmft – The average number of deciduous teeth per person which are decayed, missed and filled
- Extraction – Painless removal of tooth from its socket
- Filling – The replacement of affected tooth surface by restorative materials
- Missed – a tooth which is absent in its position due to caries
- Risk factors of dental caries – are factors which favors caries to exist
- Scaling – a procedure of removing calculus from tooth by scalers

4.12 Ethical consideration

A formal letter of permission was written by Jimma University SRP office to Liben primary school to get permission and support during data collection. The objective of the study was explained to the dean of the school and the students. They were requested for verbal consent before being recruited into the study.

3.1 Dissemination Plan

The result of the research was reported to Woliso Health Bureau, the administration of Woliso St. Lucas Hospital and the administration of Liben primary school to teach the students and the community on prevention methods of dental caries & give curative measures for those who are already affected by caries.

CHAPTER FIVE

RESULTS

Almost all the study subjects were participated in the interview process with response rate of 99.3%. Some of them refused to respond due to fear of opening their mouth during the intraoral examination. The sex distribution was 156 (57.4%) males and 116 (42.6%) females. Concerning grade level distribution, the majority of the respondents were from grade 1-4

Regarding ethnicity of students, Oromo and Amhara were the dominant ethnic group accounting for 186 (68.4%), 57(21%) respectively. Most students are followers of Orthodox Christianity 97(35.7%) and followed by followers of Muslim 83(30.5%) and Protestants 65(23.9%) and the rest 27(9.9%) were others.

The students fathers occupation were governmental employee 90(33.1%), merchant 87(32%), 98(36%) of their mother house wives, 63(23.2%) were involved governmental employee.

Most of the students 175 (64%) cleaned their teeth and 97% (36%) of them did not clean their teeth. The greater number of the students used toothpaste 57(21%)next to mefakia 105(38.6%) and 13(4.8%) were used other materials to clean their teeth. 211 (77.6%) of the students sampled consumed sugar containing food staffs. Most of the female students used to consumes sugar containing food. Biscuit and candy were the frequently used sugar containing foods by the students. They took these food staffs mostly once a week 91(35.5%), twice a day 85(31.3%) three times a day 69(25.4%) and 27(9.9%) in a week.

From the treated students extraction holds the highest number 52(19.1%) who were at age of above 17, 15(5.5%) are filled due to caries. concerning home practices, water with salt 61(22.4%), Areki 17(6.3%) and herbs 5(1.89%) respectively were done by the students. Surprisingly from all the students sampled no one smoke cigarette.

During the intraoral examination 155(57%) of the students were caries free and most of them were at the age distribution of 15-17. The prevalence of dental caries was found to be 43%. 41(15.1%) of the students with dental caries were Orthodox in religion and the rest were protestant 37(13.6%), Muslim 29(10.7%) and others 10(3.7%).

The prevalence of dental caries was strongly associated with consumption of sugar containing food staffs, tooth cleaning habits, frequency of tooth cleaning and type of cleaning material with a p-value of 0.001, 0.000, 0.000, and 0.000 respectively. There is also a significant association between age and dental caries with p-value of 0.001.

There is insignificant association between dental caries and gender, religion, grade level and ethnicity with a p-value of 0.02, 0.1, 0.4, and 0.07respectively.

CHAPTER SIX

DISCUSSION

This study assessed that the prevalence of caries and its associated risk factor including socio demographic characteristics, intake of food they use regularly feeding habits and tooth brushing habits among students of Liben primary school, Woliso town South west shoa zone ,Oromiaregionalstate,Ethiopia,2013 GC.

Most of the students of Liben Primary school were aware of the presence of dental clinic in St.Lukas hospital except some. But they were not aware of whether they have or not visit dental clinic and at what interval should they visit.

The prevalence of dental caries of liben primary school students was 43% which is less than study done in a rural highland community in northern Ethiopia among 815 in 1985, the DMFT score were 0.2, 0.05, and 0.23 for the age distribution of 12-14, 15-17 and > 17 years old respectively. Over all decayed students were 43%. This may by due to the higher consumption of sugar containing food staffs (P-Value 0.001).

The prevalence of dental caries was strongly associated with consumption of sugar containing food staffs (P- value =0.001), numerous students didn't rinse their mouth after consumption of carbohydrate. This provided adequate atmosphere to the microorganisms to develop dental caries hence those who didn't rinse had high caries rate (P-value = 0.032). No association could be forwarded with cigarette smoking since no one of them smokes cigarette.

The study showed that the dental caries was significantly less frequent among subjects who used modern teeth brush for cleaning that means toothpaste.

Most of the students consumed sugar containing food, three times a day this exposed them to high caries rate with its significance association (P-value =0.019). The study conducted in Vehkalani in 1998 to find out if there is a relationship between the occurrence of caries and subjects dental habits, such as the frequency of tooth brushing, the avoidance of sugar and regularity of dental visit and the result shows that a high frequency of tooth brush was strongly related to low occurrence of caries for both male (p value < 0.005) and women (P value < 0.001).

The types of tooth mostly affected are molars followed by premolar which is in agreement with study done on the prevalence of and distribution of caries in the 12-15 years Urban children in Nigeria which show that caries was most prevalent in the first molar (46.5%)

Females shown high number of decayed and missed which is in agreement with study done in Kenya.

Increased number of filled teeth was seen in male students than female students.

Since most of the students' parents were governmental employees they could be funded enough money to by sweet foods out of the normal consumption in their home. They experienced high intake of extrinsic sugar.

In this study, occlusal surface is the mostly affected tooth structure and palatal is the least.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

- Dental caries is prevalent or more common problem in the school
- The study demonstrates that those who did not clean their teeth, mouth, and who consumed of sugar containing food staffs shown association with dental caries.
- Most of the students knew that there is dental clinic in St. Lukas hospital but most of them did not visit at all since they have lack of awareness at what interval should they visit dentist.
- None of the students did not smokes cigarette.
- Most of the students took sugar containing food staffs three times a day, this exposed them to high caries risk.
- The type of tooth mostly affected are molars followed by premolars.
- Caries was prevalent since almost all of the students consumed sugar containing food staffs.

7.2 Recommendations

- Awareness about the effect of consumption of sugar containing food on caries development should be given for the school children.
- Families are strongly recommended to minimize the frequency of feeding sugar containing food staffs to their children.

In general the policy makers, school administrators, health care providers should also give better attention to resolve the problem of prevalence of dental caries and oral health care in school children and the community as a whole.

Table 1: The number and percentage distribution of students by socio demographic characters in Liben primary school, June, 2013

Socio-demographic characteristics	Number	Percent
AGE		
12-14	72	24.5
15-17	104	38.2
>17	96	35.3
Total	272	100
GENDER		
Male	156	57.4
Female	116	42.6
Total	272	100
RELIGION		
Muslim	83	30.5
Orthodox	97	35.7
Protestant	65	23.9
Catholic	7	2.6
Others	20	7.4
Total	272	100
GRADE LEVEL		
1-4	146	53.7
5-8	126	46.3
Total	272	100
ETHNIC GROUP		
Oromo	186	68.4
Amhara	57	21
Tigray	23	8.5
Other	6	2

Total	272	100
FAMILY INCOME/MONTH		
< 526 birr	70	25.7
526 – 800 birr	137	50.4
< 800 birr	65	23.9
Total	272	100
FATHER S EDUCATION LEVEL		
Illiterate	47	17.3
Can read and write	58	21.3
1-8	32	11.8
9-12	62	22.8
Above 12	73	26.8
Total	272	100
FATHERS OCCUPATION		
Farmer	70	25.7
Merchant	87	32
Government Employee	90	33.1
Other	25	9.2
Total	272	100
MOTHER OCCUPATION		
House wife	98	36.1
Merchant	24	27.2
Governmental employee	63	23.2
Others	87	32
Total	272	100

Table 2:- The type of material used by Liben primary school students to brush their teeth June, 2013.

Cleaning material	Number	Percent
Tooth brush with paste	57	21
Mefakia	105	38.6
Others	13	4.8
Total	272	100

Table 3:- The prevalence of dental caries by soci-demographic characteristics among Liben primary school students .June 2013.

Socio demographic	No of Examines	With dental caries		Without dental caries		Chi-square	p-value
Age group						1.95	0.001
12-14	72	36	13.2	36	13.2		
15-17	104	42	15.4	62	22.8		
> 17	96	39	14.3	57	21		
Total	272	117	42.9	155	57		
Gender						9.82	0.02

Male	156	45	16.5	111	40.8		
Female	116	52	19.2	64	23.5		
Total	272	97	35.6	272	64.3		
Religion							
Orthodox	97	41	15.1	56	20.6	6.2	o.1
Muslim	83	29	10.7	54	19.9		
Protestant	65	37	13.6	31	11.4		
Others	27	10	3.7	17	6.3		
Total	272	117	43	158	58.2		
Grade l							
Evel							
1-4	146	66	24.3	80	29.4	0.62	0.4
5-8	126	51	18.8	75	27.6		
Total	272	117	43.1	155	57		
Ethnicity							
Oromo	186	62	22.8	124	45.6	23.2	0.00
Amhara	57	38	14	19	7		
Tigray	23	14	5.1	9	3.3		
Others	6	3	1.1	3	1.1		
Total	272	117	43	155	57		

Table 4:- prevalence of dental caries by predisposing and associated risk factors among Liben primary school students, June 2013.

Predisposing/Risk factor	Total	With dental caries		Without dental caries		Chi-square	p-value
		No	%	No	%		

Oral hygiene practice							106	0.000
Tooth cleaning								
Yes	175	35	12.9	140	51.5			
No	97	82	30.1	15	5.5			
Total	272	117	43	155	57			
Frequency of cleaning							30.9	0.000
After every meal		67	5	1.8	62	22.8		
Twice/day	76	7	2.6	69	25.4			
Once/day	17	4	1.5	13	4.8			
Sometimes	15	9	3.3	6	2.2			
Total	175	25	9.2	150	55.2			
cleaning material							25.3	0.000
Tooth brush with paste	57	18	6.6	39	14.3			
Mefakia	105	13	32.7	116	42.6			
Others	13	4	1.1	1	0.4			
Total	175	25	40.4	156	57			
Time of cleaning							29.1	0.000
Morning		57	15	5.5	68	25		
Before	27	12	4.4	15	5.5			
Mixed	76	7	2.6	69	25.4			
Not fixed		15	9	3.3	6	2.2		
Total	175	43	15.8	158	58.1			
Dietary habits								
Consumption of sugared foods							28.7	0.000
Yes	2.11	109	40.1	102	37.5			
No	61	8	2.9	53	19.5			
Total	63.11	117	43	155	57			
Type of sugar containing food								
Candy	70	39	14.3	31	11.4	9.5	0.001	
Biscuit	81	50	18.4	31	11.4			
Sweet milk		58	27	10	17	6.3		
Others	2	1	0.4	1	0.4			

Total	211	117	43	70	29.5		
Frequency of consumption							
3 X1 day	69	43	15.8	26	9.6	17.2	0.001
2 X 1 day	85	36	13.2	49	18		
1 X 1 week	21	27	9.9	64	23.5		
Some times	27	11	4	16	5.9		
Total	202	117	43	155	57		
Who rinse their mouth after for consumption							
Yes	114	23	8.5	91	33.5	41.8	0.000
No	158	94	34.5	64	23.5		
Total	272	117	43	155	55		
Smoking habits							
Active smoking							
Yes	-	-	-	-	-		
No	272	117	43	155	57		

Table 5:- Distribution of DMFT by age group, sex, religion, grade level & monthly family income Liben primary school students June, 2013.

	Decayed	Missed	Filled	Mean DMFT
Age group				
12-14	36	12	4	0.2
15-17	42	18	9	0.25
> 17	39	22	2	0,23
Total	117	42	15	0.68
Gender				
Male	45	20	13	0.29
Female	52	32	12	0.32
Total	97	52	25	0.61
Religion				
Orthodox	41	16	6	0.23

Muslim	29	12	5	0.17
Protestant	37	14	4	0.2
Other	10	10	0	0.1
Total	117	52	15	0.7
Grade-level				
1-4	66	11	3	0.32
5-8	51	31	12	0.35
Total	117	42	15	0.67

Table 6:- Distribution of DMFT by type of teeth affected among Liben Primary School June, 2013.

			Arch	Tooth			
	Central	lateral	Canine	1st pm	2nd pm	1stM	2nd M
Maxillary right							
Right							
D	0	0	0	3	5	17	0
M	0	0	0	1	5	3	3
F	0	0	0	2	1	1	0
Total	-	-	-	6	11	21	3
Left							
D	0	0	0	0	0	29	0
M	0	0	0	3	2	4	4
F	0	0	0	0	1	1	1
Total	-	-	-	-	3	34	5
Mandibular Right							
Right							
D	0	0	0	0	0	27	13
M	0	0	0	3	2	8	9
F	0	0	0	2	2	1	1
Total	-	-	-	5	4	36	23
Left							
D	0	0	0	4	6	13	0

M	0	0	0	0	0	2	3
F	0	0	0	0	1	1	0
Total	-	-	-	4	7	16	3

Table 7:- Type of home practice provided for dental problems among Liben primary school students June, 2013.

Home practice done	Number	Percent
Not any form of treatment	45	16.5
Water with salt	61	22.4
Areki	17	6.3
Application of herbs	5	1.8
Total	83	30.5

Table 8:- Treatment done for dental problems among Liben primary school students June, 2013.

Treatment done	Number	Percent
Scaling	11	4
Extraction	52	19
Filling	15	5.5
Other	23	8.4
Total	101	36.9

Table 9:- Distribution of dental caries according to tooth surface among Liben primary school students June, 2013.

Tooth surface	Permanent tooth	
	Number	Percent
Occlusal/incisal	47	17.3

Interproximal	21	7.7
Buccal/labial	33	12.1
Lingual/palatal	16	5.9
Total	117	43

Annex-I

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ANNEX II

QUESTIONNAIRY

JIMMA UNIVERSITY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES

SCHOOL OF DENTISTRY

Questionnaire to be filled by students of Liben primary school. This questionnaire is designed for the purpose of determining the prevalence of dental caries and its associated risk factors among students of Liben primary school.

Instruction

Please read the questions carefully and put 'X' mark in the space provided where required.

1. General information

1. Name _____
2. Age _____
3. Sex Male Female
4. Place of residency Rural Urban
5. Religion

Orthodox Muslim

Protestant Other

6. Ethnicity Amhara Oromo

Tigray Other

7. Grade level 1-4 5-8
8. Family income /month <526.birr 526-800 birr 800birr
9. Fathers educational level

Illiterate

Can read and write

1-8

9-12

Above 12

10. Mothers Education Level

Illiterate Can read write

1-8

9-12

Above 12

11. Father Occupation

Farmer

Merchant

Government Employer

Other (specify)

12. Mothers Occupation

House Wife

Merchant

Farmer

Government employer

Other (specify)

Oral hygiene Practice

1.Do you brush your teeth? Yes NO

1. How often do you brush your teeth?

After every meal

Twice / day

One /day

2. What material do you use to clean your teeth?(you may choose more than one)

Tooth brush with paste

Mefakia

Charcoal

Other / specify/

1. Where do you brush your teeth (you may choose more than one)

Morning

Before

Mixed

Not fixed

2. DI ETABY HABITS

1. Do you eat sugar containing foods?

Yes No

2. If your answer for Q1. Is yes which of the following food do you eat?

Candy Biscuit

Tea coffee Sweetend milk

Others (Specify)

3. How often do you eat sugar containing foods

3 times in a day

2 times in a day

Once a week

sometimes

4. SMOKING HABITS

1. Do you smoke cigarette Yes No

2. How often do you smoke cigarette (If yes for Q.1)

Occasionally

Once a week

1x/day

> Once a week

5. FLUORIDE SUPPLEMENT

1. Do you use fluoridated tooth paste to brush your teeth?

Yes No

6. DENTAL CLINIC VISITING HABITS

1. What treatment do you got at home for dental problem?

Not used any treatment

Water with salt

Anti pain

Application of herbs

Other (Specify)

2. Have you ever had dental problem in previous 3 months? A. yes B. NO

3. If your ans. For Q.2 is yes what treatment do you got for the problems?

Scaling

Extraction

Filling

Other (Specify)

Oral Examination

17 16 15 14 13 12 11 21 22 23 24 25 26

27

47 46 45 44 43 42 41 31 32 33 34 35 36

37

A2 dmft index

55 54 53 52 51 61 62 63 64 65

85 84 83 82 81 71 72 73 74 75

Where S = Sound tooth

D = Decayed

M = Missed due to caries

F = Filled

B1 DMFT index

17 16 15 14 13 12 11 21 22 23 24 25 26 27

47 46 45 44 43 42 41 31 32 33 34 35 36 37

B2 – dmfts index

55 54 53 52 51 61 62 63 64 65

85 84 83 82 81 71 72 73 74 75

Yuniversiitii Jimmaa

Kolleejjii Fayyaa Ummataafi Saayinsii Medikaalaa Mana Barumsa Yaala Ilkaanii. Gaaffiilee Barattoota Mana Barumsa Liiban Sadarkaa 1ffaa tiin guutamu .Gaaffileen kun babalina tortoruu ilkanii fi rakkoolee isaan dhufan beekuuf kan nu gargaaruudha.

Ajaja

Maaloo, gaaficha haalan dubbisiitii mallattoo ”x” bakka duuwaa siif kennametti guuti.

I. Odeeffannoo walii galaa

1. Maqaa_____

2. Umrii _____

3. Saala dhiira dhalaa

4. Bakka jireenyaa baadiyyaa magaala

5. Amantaa ortodoksii musiliima pirootestaantii kanbiraa____

6. Saba Amhaaraa Oromoo Tigraay. kan biraa_____

7. Sadarka barumsaa 1-4 5-8

8. Galii warraa/ jia <526 birr 526-800 birr >800

9. Sadarkaa barumsa

kan abbaa. kan hin baranne

Barreessuufi dubbisuu kan danda'u

1-8

9-12

12-10

10. Sadarkaa barumsa kan haadhaa Kan hin baranne

Barreessuufi dubbisuu

kan dandessu

9-12

12 ol

1-8

11. hojii abbaa Qote bulaa Kanbirra (ibsi) Daldalaa Hojjataa mootummaa

12. Hojii Haadhaa

Hojjattuu manaa Daldaltuu Hojjattuu moutumma Kan birra (ibsi)___

Karaalee Qulqullinni Afaanii itti eegamu

1. I lkaan kee nj rjgattaa? Eeyyee lakki

2. Ilkaan kee yeroo meeqa rigatta? Nyaata booda yeroo hunda quyyatti yeroo lama guyyaatti yeroo tokko Yeroo tokko tokko

3. Ilkaan kee rigachuuf meeshaa akkamii fayyadamta? (tokko ol filachuu ni dandeessa)

Biruushii ilkaanii saamunaa ilkaanii faana Rigaa mukaa Cilee Kanabiraa (ibsi)

4. Ilkaan kee yeroo kam rigatta? (tokkoo ol filachuu ni dandeessa)

Barii Galgala yeroo lachuu dhaabbataa miti

Amala Nyaachuu

1. Nyaata sukkaara of keessaa qabu ni nyaattaa eeyyee Lakki

2. Deebiin kee gaaffii 1ffaa Eyyee kan jedhu yoo ta'e Nyaata armaan gadii keessaa kam nyaatta?

Karameella Biskuutii aannan mi'aawaa

kan biraa (Ibsi)

3. Nyaata sukkaara qabu yeroo meeqa nyaatta?

Guyyaatti yeroo sadi qyyaatti yeroo lama guyyaatti yeroo lama

Guyyaatti yeroo tokko torbanitti yeroo lama Yeroo tokko tokko

Amala sigaaraa Aarsuu

1. Sigaaraa ni Aarsitaa? Eeyye Lakki

2. Sigaaraa yeroo meeqa Aarsita? (yoo deebiin kee gaafii tokkoffaa Eeyyee ta'e)

Darbee darbee Torbanitti yeroo tokko Guyyaatti yeroo tokko

Itti fayyadama filooraayidii

1. Ilkaan kee rigachuuf saamunaa ilkaanii filooraayidii qabutti ni fayyadamtaa?

eeyyee lakki

Eegumsa Ilkaanii

1. Mana keetti rakkina ilkaanii si mudatef furmaata akkami argatte?

Furmaata tokko him arganne Ashahaboo bishaaniin bulbulame

Qoricha dhukkubbii Araqee Qoricha Aadaa kan biraa (ibsi) _____

2. Jioota sadan darbanitti rakkinni ilkaanii si meedatee beekaa?

Eeyyeee Lakki

3. Kan simudate you ta'e yaala akkami argatte?

Ilkaan dhiquu Ilkaan guutuu Ilkaau buqqisuu Kan biraa (Ibsi)