ADDIS ABABA UNIVERSTY

SCHOOL OF GRADUATE STUDIES

DETERMINANTE FACTORS OF DEANTAL CARIES IN ETHIOPIAN MILITARY PERSONNAL

BY

SENAIT MANTEGAFTOT (B. Sc)

A THESIS TO BE SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTER IN PUBLIC HEALTH

Advisor: Dr. Nigusse Deyessa (MD, MPH)

APRIL, 2005

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LIST OF ABBREVIATIONS

CI:-	Confidence Interval
DMFT:-	Decayed, Missing and Filled permanent teeth
E.C:-	Ethiopian Calendar
Km:-	kilometer
PVT:-	Private Soldier
OR:-	Odds Ratio
South.N	Southern Nationalities
WHO:-	World Health Organization
Yr :-	year

Abstract

A military based case-control study was conducted from December, 2004 to February, 2005 among Core 105 Ethiopian Army found around Dessie, to assess socio-demographic and lifestyle determinants of dental caries and to review knowledge and practices towards oral health among cases and controls of dental caries in military personnel.

The study population was selected using multi-stage sampling technique, comprising stratification and simple random sampling technique. Dental examination was undertaken to identify cases and controls of dental caries. Once cases and controls were identified, a semi-structured and self administered core questionnaire was made.

Oral hygiene practice was found to be lower among cases (57.0 %) as compared to their controls (83.2%), and the differences was statistically significant after adjusted for other variables (OR= 3.40, 95 % CI, 2.30, 5.02), but there was no differences among cases and controls in using toothpaste, tattooing the gum and mouse rinsing practices.

In this study, year of employment, (being employed in 1990 or after 1990 E.C), grow rift valleys area, consumption of sweet food items, Khat chewing habit and presence of calculus, gingivitis and plaque in the oral cavity was significantly associated with dental caries.

There was no significant difference among cases of dental caries and their controls in their knowledge towards oral health, age, rank, educational status, marital status, religion, ethnicity, diet ,alcohol drinking, and cigarette smoking habits .

Promotion of good oral hygiene practices In addition, initiation and strengthening of the screening program for the new militaries are recommended to minimize cases of dental caries. The results of this study help the Health Command and other concerned bodies to design effective intervention and strategies to improve oral health of the militaries.

1. INTRODUCTION

Dental caries is among the most prevalent and costly diseases affecting both developed and developing countries, and yet it is highly preventable (1).

The distribution and severity of dental caries vary in different part of the world, and within the same country or region. A data base was established over a number of years and increasing number of epidemiological studies documented. A pattern of change in caries prevalence that is increasing in certain developing countries and decline observed in many developed countries. (2)

The caries decline observed in many developed countries was the results of a number of public health measures, coupled with changing living condition, life style, and improved self care practice. The trends of dental caries in developing countries were increasing at freighting rate. The explanation for this said to be the growing consumption of sugar and inadequate exposure to fluoride (2).

Throughout the world losing teeth is seen by many people as natural consequences of aging while in same industrialized countries there is a positive trend of reduction in tooth loss among adults in recent years. In many developing countries access to oral health service is limited and teeth are often left untreated or are extracted because of pains or discomfort (3).

In African countries oral health has started to deteriorate and currently it is expected that the incidence of dental caries will increase (4). About 90 % of dental lesions in African

countries are untreated, and this reflects the minimum amount of dental treatment received by the population which may be explained by the current unfavorable dentist/ population ratio, inadequate facilities, and resources as well as poor dental health awareness in the general population. (5)

In Ethiopia the previous reports have indicated that “Ethiopians have excellent teeth and that their dental needs are low. However, after same years the literature does not substantiate this view and, indeed paints an alarming picture of wide spread dental disease among this population dental disease is prevalent in the Ethiopian population and there is evidence that is increasing. The average person understands of this problem and its prevention is virtually non existent. For example, the number of people who maintain an acceptable standard of oral hygiene is low in addition; harmful traditional practices are still prevalent (6).

Oral health and its relation to military readiness have become increasingly important in recent years. An oral health survey of military recruits conducted in United Nation by the Department of Defense (DOD) in 2000 indicated that an increasing number of recruits were coming to this service with oral health problem, while the number of practicing military dentists was decreasing. From that prospective, oral health can be seen as a national security issue. “Dental caries is taken seriously by the army” because a solider who is in the filed in pain and no where near a dentist will be distracted and less focused, his or her effectiveness will be compromised (7).

No effective measures existed for preventing dental caries, and the most frequent treatment was tooth extraction. Failure to meet the minimum standard of having six opposing teeth was a leading cause of rejection from military service in both world wars. (8)

In Ethiopia oral disease and their treatment receive little attention and public health planning (6). Studies are not carried out sufficiently and also there is no reported studies showing dental health problems in relation to military personnel. Therefore the present study attempts to assess the risk factor for dental caries in military personnel.

2. Literature Review

2:1 Occurrence

Dental caries has been known throughout history but a sharp increase occurred in prevalence and incidence of the disease during the 1920s and 1950s, and it became recognized as a major health problem in same countries notably when demand for caries was increased in 1950_5 and early 1960s, and some countries recorded that almost no children were free from caries (9).

Certain developing countries have reported an increase in dental caries in 1980s and the raising trend of caries incidence in developing countries accounted for 75 % of the world's population out weighed the opposite trends in the developing countries (9).

At the beginning of 20^{th} century, extensive dental caries was common in the United States and in most developed and developing countries. In the United Kingdom, in 2000, a study done in children showed that caries affects 80 % of youth by the age of 17 years, (10).

An oral health survey conducted in southern region of Italia on a total of 5,064 persones showed that the mean DMFT was 2.12 and 36.5 % were caries free. As shown in this study the prevalence of dental caries in Italy is similar to most European countries even though the lowest values were found in the Northern European countries. "Data collected in the Ventura Region over the last 20 years shows a declining trend in caries from mean DMFT of 4.4 in the early 80s to 2.2 in 1994. "This is similar trend in other southern European countries for example Spain and France (11).

A study done in Southern India on rural population in 1992 showed that 30 % of the population had dental caries, and 16.2% had one or more teeth missing (11).In South African population tooth decay is widespread, but is also displays wide variation in prevalence and severity across communities, and the values for DMFT (Decayed, Missed, and Filling Teeth) range from 5 to 32. (12)

The prevalence of dental caries approaches 90 % in most South African adult communities An oral health survey done in South Africa in 1998, showed that 4.3 million (34.6 %) African men, and 6.3 million (46.9 %) African women aged ≥ 15 years experience oral health problem (13).

The 1958 Littleton's national survey had shown that its prevalence rate was low (23 %) and the majority of (77 %) population being free of dental caries as all studies agreed on an individual bases. However, the prevalence of caries in the population as a whole has increased recently (6).

In Ethiopia a survey of dental health conducted among 232 students in 6 campaign posts from three regions in 1976 showed that the DMFT rate was 53 % (49 %, 54 %, 65 % in age group of 15-19, 20-24, 25 years and over, respectively), only 37 (28.5 %) reported regular oral hygiene practice after at least two meals.(14)

The mefakiya, or local twig brush, was the means most regularly used (86 %), only 9 students used tooth pastes Thus for the age groups of 15-19 and 20-29 years, ICNND reported rates of 14 % and 22 % respectively (10). While this study finding rates were 49 %

and 61 % (for those 20 years and above). “There has been a steady increase in dental caries during most of recorded medical history (14).

The study done in Kimer Dingay North-Western Ethiopia, in 1985 indicates that the overall prevalence of dental caries was 47.1 %, the age group 20-29 years constituted the highest proportion, 16.7 %, and the males who had good oral hygiene only 18.6 % were positive for dental caries, and of females with oral hygiene the percentage was 27.9 % with caries. With bad oral hygiene, the dental caries percentage was 61.1 % and 70.11 % for males and females receptively. Among those using the local tooth brush (mefakiya) made from a twig, 23.1 % were caries positive and the rest negative (15).

A cross sectional community based survey done in Shashemene Woredas in south eastern Ethiopia in 1994, on 1228 individuals showed the overall prevalence of dental caries to be 51.4% it beings higher among rural residents (53.7 %) than urban residents (46.4 %). Dental caries prevalence showed an increase with increase in age (16).

2:2 Determinant Factors

Dental caries is a localized, progressive distraction of teeth which is caused mainly by organic acids, produced by microorganisms on the tooth surface that ferment carbohydrates, particularly sugars. The interrelationships of multiple factors are involved in the etiology of dental caries. Only when a susceptible surface, caries specific bacteria, and substrate or diet, are present and interacting for sufficient length of time does dental caries to develop (17,18 21).

Oral Hygiene

Oral hygiene is the maintenance of a state of normal health in the mouth taken as a whole enabling its function namely mastication deglutination, phonation and esthetic properties to be carried out with maximum efficiency. (19) Daily tooth brushing and proper dental care help prevent and reduce tooth decay and, as studies showed that there is a relationship between frequency of brushing and dental caries. (11, 16, 17)

Diet

Epidemiology studies clearly demonstrated the relation ship between diet and dental caries. Study of population living primarily on starchy foods but consuming little sugar have found low caries rates. Starch can cause caries but mach less than caused by sugar. Stable starchy foods, such as potatoes, pasta, rice and bread, are considered little threat to teeth. If starch finally ground, heat-treated and spatially mixed with sugar it can cause caries. There is much evidence that frequency of ingestion of dietary sugars is an important variable in caries etiology. Since the PH of dental plaque falls each time sugars are ingested, it stands to reason that the more times plaque PH will be depressed to a level at which dental enamel may dissolve. (11, 20, 22)

Sugar does not work alone /it also needs oral bacteria, teeth and time/ it is an essential component in the pathogenesis of dental caries. Evidence shows that free sugars are undoubtedly the most important dietary factors in the development of dental caries and the process depends on a sustained supply of fermentable sugars. The simultaneous presence of fermentable sugar and specific bacteria /mainly Streptococcus mutans/ lead to significant carries. (21)

Bacterial plaque

Is one of the most important etiologic agent for dental disease it begins as a clear film that stick to tooth and is made up bacteria, salivary product and dead cells from the oral mucosa If it sticks and so food contains refined sugar are easily trapped in it the bacteria in the plaque broken dawn the sugar to form acid which combine with plaque to form acid plaque this attacks teeth to form cavities. (22)

The amount and type of bacterial plaque formed is mainly related to two factors; the type of carbohydrate in the diet and the efficacy of oral hygiene measure. The organism in dental plaque will produce organic acids if certain sugars are eaten. The concentration and quantity of acids formed vary according to the type of sugar containing food eaten and the relationship of foods more than three times a day the hydrogen ion concentration of dental plaque will remain below PH 5.5 (23).

Dental calculus

Is basically plaque, which hardens by absorbing certain salivary minerals like calcium, phosphors and magnesium in crystalline hydroxyl apatite form calculus promotes farther plaque formation retaining bacteria close to tissues.(17)

Fluoride

Fluoride has the ability to inhibit demineralization of the enamel and to enhance re mineralization, that is, enhance repair by its presence in saliva and plaque. Further, fluoride has several antibacterial properties. Its concentration in plaque is sufficiently high to disrupt

bacterial enzyme systems, thus resulting in less acid production and possible prevention of bacterial adhesion to the enamel surface (18).

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Water fluoridation has been recognized as a significant method in preventing tooth decay since the 1930s.In areas where water fluoridation is not practical or desirable; fluoride supplements in the diet during the ages of tooth formation can provide protection. Some countries make fluoridated salt available. Other countries depend only on the topical application of fluoride by a dentist or dental hygienist, or on mouth washes containing fluorides. However, water fluoridation remains the cheapest, most effective form of fluoride treatment. (24)

3. Objectives

General objectives

- To assess the determinants factors of dental caries among military personnel of core One Hundred Five Ethiopian Army.

Specific objectives

- To identify socio-demographic charactstics Lifestyle charactstics and nutritional factors associated with dental caries in military personals.
- To assess knowledge and practices towards oral health among cases and controls of dental caries of military personnel.

4. Methods

4.1 Study Design

The study was a case-control study conducted from December, 2004 to February, 2005 among Ethiopian Core 105 Army to assess determinates of dental caries and review knowledge and practices towards oral health among cases and controls of dental caries of military personnel

4.2 Study Area

The study was conducted in area known as Dessie, which is located 400 Km North of Addis Ababa. In this area Core One Hundred Five of the Ethiopian army was assigned. The core has a Core staff having four departments, Infantry division having 16 battalions, and Mechanized division, having 12 battalions. Within the core there is a military hospital, having a dental care unit and there is a health station in each battalion for minor curative and preventive health services.

4.3 Study Population

All members of Ethiopian Core 105 Army were the source population. Members of the Army, who were on their annual leave, were excluded from the study.

4.4 Sample size

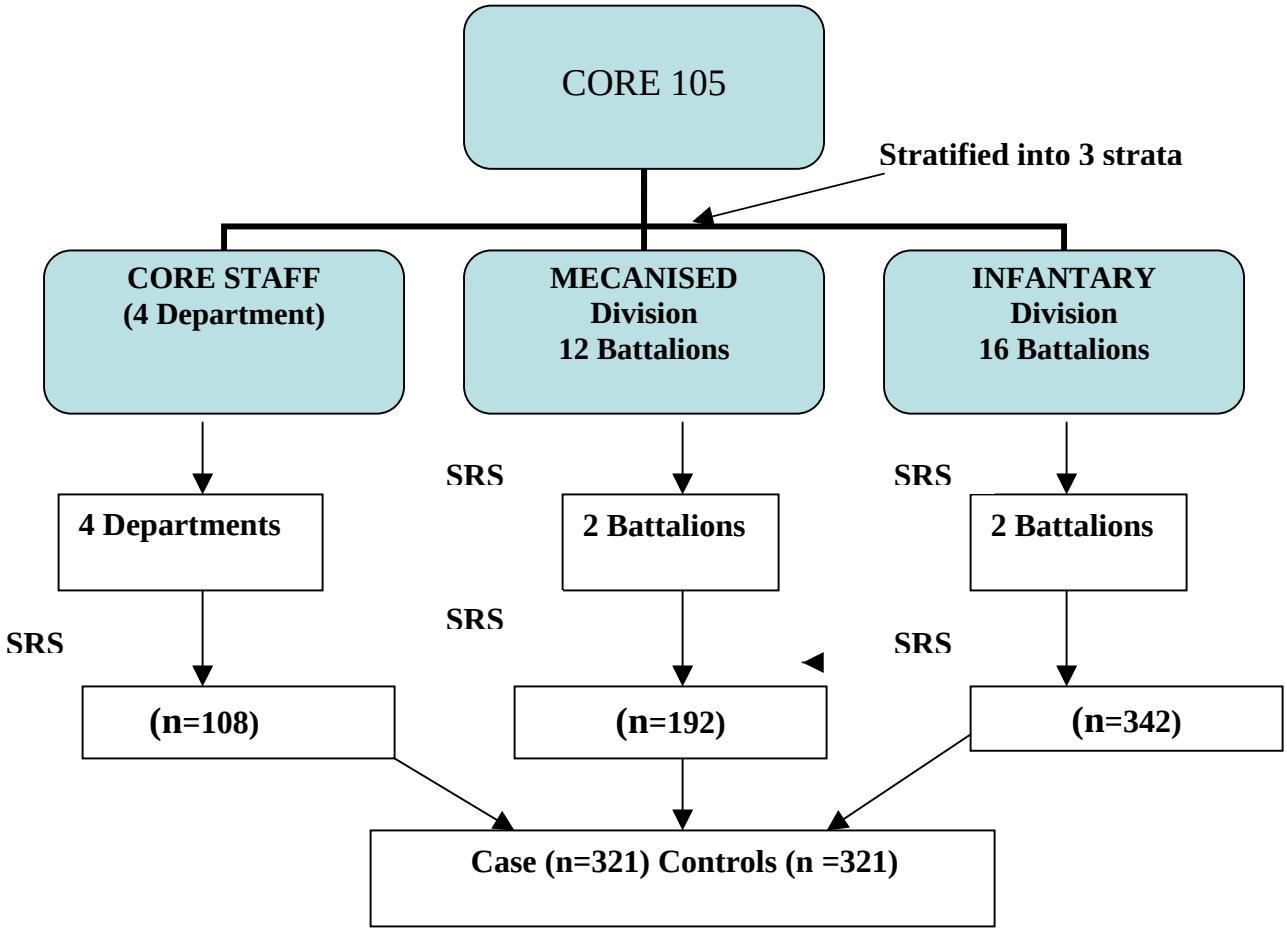
The sample size was calculated using sample size determination for case-control study design based on 95 % Confidence Interval, 80 % power and a probable exposure to a refined sweet of 60 % among cases of dental caries (16), a sample size of worthily determining of at least odds ratio of 1.65, and with a ratio between cases and controls of one to one. Accordingly, the sample size for each study group was 298. Adding 10 % for possible non-response, a minimum sample size of 328 cases and 328 controls of dental caries were needed.

4.5 Sampling procedure:

Core One Hundred Five Ethiopian Army was selected by convenience and the study population was selected using multi-stage sampling technique, comprising stratification and simple random sampling technique and the core stratified by their category into three strata, core staff, mechanized division and infantry division. To allow a representative proportion, the sample size was divided according to the probability to population size of militaries in the infantry, mechanized divisions and core staff.

Two Battalions of the 12 battalions in the mechanized division, and two battalions of the16 battalions in the infantry division were selected by simple random sampling. The study subjects from the three strata were selected using simple random sampling. Payroll was used as a sampling frame to identify the total number of soldiers in the core. Selected individuals took dental examination, and whenever an individual is found to have a dental caries, he or she was considered as a case, and if the next individual has no dental caries he/she was considered as a control until we get the required sample size. Selected individuals as a case or control were requested to continue to fill the prepared questionnaire to assess determinants of dental caries.

Fig.1.Architecture of sampling frame–work



4.6 Data Collection

A. Questionnaire

A self-administered questionnaire to assess socio-demographic and lifestyle characteristics, nutritional factors, knowledge and practice towards oral health among cases and controls of dental caries of the military personnel was first prepared in English and translated to Amharic and back to English for its consistency. The questionnaire was pre-tested among 20 military personnel attending dental clinic and other out patient clinics of the Armed Force General Hospital, Some modifications concerning clarification of the content and simplification of the wording was considered necessary after the pre-testing of the questionnaire.

B. Dental Examination

Dental examination was carried out to all randomly selected soldiers to identify cases and controls by two calibrated dental therapists under field condition with an assistant recording the observation. Prior to the study Dental therapists were given a brief reinforced training on dental caries assessment according WHO recommendation by dental specialist at Armed Force General Hospital, to maintain uniform and standard dental assessment. During the training each dental therapist examined 10 cases independently and, re-examined by both examiners for intra-examiner agreement, and another 10 subjects were re-examined for inter-examiner agreement .Intra-examiner and inter-examiner agreement for caries scoring was tested, and ranged from k= 0.86 to 0.94 it was found in good agreement according WHO recommendation (25) Caries experience was assessed using the DMFT indices as described by the WHO Oral Health Surveys (25). Caries was recorded as being present when a lesion in a pit or fissure or on smooth tooth surface had a detectable softened floor, undermined enamel or softened wall. A filled tooth also included in this

category when it contains one or more permanent restorations and one or more areas that are decayed. On proximal surfaces, the examiner should be certain that the explorer has entered a lesion. Where any doubt existed, caries was not recorded as present. Tooth was considered missing because of caries if a person gave a history of pain and / or presence of cavity prior to extraction and, the findings were charted on the oral health assessment form. (Annex B) The dental examination was done in daylight and supplemented by a flash light. Plane mouth mirrors, sharp dental probe, and disposable wooden spatula were employed to assess carious lesion. Plan mouth mirror and dental probe were disinfected and autoclaved after each examination through out the procedure.

4. 7 Data Analysis

Data entry and clearing was done using EPI info version 6.04d statistical package, and analysis was made using SPSS statistical program. To compare determinants of dental caries between cases and controls, X^2 was employed and was presented using the odds ratio and 95 % Confidence Interval. Logistic regression was used to control for confounding variables. Data were presented using tables and figures.

4.8 Ethical considerations:-

Approval of ethical clearance was taken from research and publication committee of the Department of Community Health, Addis Ababa University. A written permission was obtained from Core One Hundred Five Ethiopian Army. Informed consent was obtained from the study subjects and dental examination was done on voluntary bases. Upon completion of dental examination and the interview, health education about oral health was given to the study subjects and those with oral health problem were given appropriate therapy and those with sever problem were referred to Army Hospital**.** A brief report was given to the concerned body that participated in the study.

Variables of the study

Independent variables:--Socio-demography characteristic, including age, rank, marital status, year of employment, ethnicity, religion, educational status, and place of birth. Life style characteristic, including use of alcohol, cigarette, and khat, dietary habit, oral health knowledge and practices

Dependent variables: --- presence of dental caries and absence of dental caries.

5. Results

5:1 Socio-demographic characteristics of study subjects

A total of 656 military personnel were enrolled after fulfilling the inclusion criteria, out of which 14 military personnel refused to participate, which makes the non-response rate 2.0 %. The most common reason for non-participation was fear of rejection from the military service. Complete data were obtained from 642 military personnel, out of which 321 were cases of dental caries that consisted equal number of controls.

Majority of participants 638 (99.4 %) were males, and 4 (0.6 %) were females. A Four hundred and seventy one (73.4 %) of the study subjects were in the age group between 20 and 29 years, with a mean and standard deviation of age of 27.8 $\pm$ 5.1 years. One hundred and eight (16.8 %) of the study subjects were from the core staff, 192 (29.9 %) from mechanized division, and the remaining 342 (53.3 %) were from the infantry divisions.

A large proportion 563 (87.6 %) of the study subject were employed into the military services in1990 or after 1990E.C while the rest, 79 (12.4 %) were before 1990 E.C. Almost two thirds 402 (62.6 %) of the study subjects had private military rank followed by 188 (29.3 %) non Officers while the rest, 53 (8.2 %) were junior and senior Officers.

Three hundred and eighty four 384 (59.8 %) study subjects were never married; while the rest 258 (40.2 %) study subjects were currently married, divorced or widowed. About three quarter of the study subjects claimed to attend Elementary school while the other162 (25.2 %) attended secondary or more schooling.

Four hundred and sixty six (72.6 %) of the militaries were Orthodox Christians, followed by 113 (17.6 %) Muslims and the rest 63 (9.8 %) belonged to other Christianity religions. The major ethnic group of the study subjects was Amhara which constituted 249 (38.8 %), followed by Oromo constituting 142 (22.7 %), while other ethnic groups (Southern .N, Guragae and Somalis) constitute 251 (39.1 %) of the study subjects.

Three hundred and seventy three (58.1 %) of the study subjects were born in rural areas of the country, while 584 (91.0 %) of the study subjects reported to grow outside the rift valley areas, (Natherate, Awassa, Wonji, Zeway,Arbaminch .) (Table I).

Table I Socio-demographic characteristics of study participants of Core 105 Ethiopian Army May, 2005

Characteristics	Number	Percent
Sex		
Male	638	99.4
Female	4	0.6
Age		
20-29	471	73.4
30 or more	171	26.6
Mean ± SD	27.8±5.1	
Category of militaries		
Core staff	108	16.8
Mechanized	192	30.0
Infantry	342	53.2
Year of Employment		
Before 1990	79	12.4
1990 or After 1990	563	87.6
Military rank		
PVT	402	62.6
non Officer	188	29.3
Junior/ senior Officer	53	8.1
Marital status		
Never married	384	59.8
Married, Widowed and divorced	258	40.2
Educational status		
Elementary	480	74.8
Secondary or more	162	25.2
Religion		
Orthodox Christ.	466	72.6
Muslim	113	17.6
Other Christ.	63	9.8
Ethnicity		
Amhara	249	38.8
Oromo	142	22.1
Others	251	39.1
Place of birth		
Urban	269	41.9
Rural	373	58.1
Place of growth		
Outside rift valley	584	91.0
Rift valley area	58	9.0

5:2 Life style characteristics, Food consumption pattern and oral hygiene practices

Of the total study subjects, 394 (61.4 %) were currently smoking or used to smock cigarettes in their life time, 363 (56.5 %) reported to chew khat currently or in their life time and only 114 (17.8 %) reported to have alcohol drinking habit currently or in their life time.

The majority 597 (93.0 %) of study subjects reported that bread was their staple food for break fast, lunch or super time where as 155 (24.1 %) reported that Enjera was their staple food for break fast, lunch or supper time. About a three quarter of study subjects claimed to have habit of drinking coffee and/ or tea with sugar and, 570 (88.8 %) of the study group reported that they had habit of drinking soft drinks.

When study subjects were asked for usual intake of sweet food items like cookies, about 327 (50.9 %) of them reported that they were consistently taking sweet food items. One hundred ninety two (29.9%) study subjects reported that they do not have a habit of brushing/cleaning their teeth with tooth brush or cultural stick (Table II).

Table II Lifestyle characteristics, food consumption pattern and oral hygiene practices of Core 105 Ethiopian Army May 2005.

Characteristics	**Number**	**Percent**
Khat chewing habit		
Never chew	279	43.5
Chew	363	56.5
Cigarette Smocking habit		
Never smock	248	38.6
smock	394	61.4
Alcohol drinking habit		
Never drink	528	82.2
drink	114	17.8
Bread as major staple food		
No	45	7.0
Yes	597	93.0
Enjera as major staple food		
No	487	75.9
Yes	155	24.1
Habit of drinking tea and coffee with sugar		
No	165	25.7
Yes	477	74.3
Habit of drinking soft drinks		
No	72	11.2
Yes	570	88.8
Usual intake of sweet food items		
No	315	49.1
Yes	327	50.9
Habit of teeth brushing/cleaning		
No	192	29.9
Yes	450	70.1

5:3 Knowledge and Practice on Oral Health.

Assessment of the responses to the eight questions related to oral health knowledge showed that, both cases of dental caries and controls had highest knowledge about dental caries. More than 80 % of cases of dental caries and their controls knew about prevention and control of dental caries. Assessing for difference in oral health between cases and controls of dental caries, there was no difference on a single knowledge question among cases and their control. Further combining the questionnaire for knowledge, in which an individual was considered as knowledgeable if he/she knew all the eight questions on knowledge of oral health. There was no difference in overall knowledge between cases and control of dental caries. (Fig II).

Study subjects were also assessed for their practice on prevention of dental caries, and 267 (83.2 %) of the controls and 183 (57.0 %) of cases reported that they were cleaning their teeth with tooth brush or local tooth stick consistently. This difference in cleaning of their tooth between cases of dental caries and their controls was significant at $P < 0.0001$.

About 34 (18.6 %) of cases and 57 (21.3 %) of controls who consistently clean their tooth; claimed that they were using toothpastes. Forty five (14.0 %) of the cases of dental caries and 35 (10.9 %) of controls did tattooing as a traditional practice to prevent dental caries, and the majority 292 (91.0 %) of cases, and 297 (92.5 %) of controls were clamed that they were practicing mouse rinsing with water after each meal. These differences in use of toothpaste, tattooing the gum as a traditional practices, and mouse rinsing with water among cases and controls of dental caries were not to be found significantly different (Fig III).

More than (90 %) of cases and their controls have heard about dental caries and oral hygiene; the majority (78 %) cited that they have heard from health personnel, while the rest have heard from friends and families (Fig IV).

Among 138 (43.0 %) non-cleaner cases of dental caries when asked about the main reasons for not practicing tooth cleaning / brushing, A large proportion 72 (52.2 %) of non- cleaner cases of dental caries cited the reason for not cleaning was due to negligence, while 28 (20.3 %) and 24 (17.4 %) clamed that they didn't know its importance and due to lack of sufficient time respectively. Of the 54 (16.8 %) non- cleaner controls the main reasons for not practicing tooth cleaning / brushing , Majority 36 (66.7 %) reported that it was due to negligence, followed by 11 (20.4 %) 6 (11.1 %) cited it was due to lack of sufficient time, and due to lack of knowledge of its importance respectively (Fig V).

Fig II Description of knowledge on oral health of cases and control of dental caries Of Core 105 Ethiopian army, 2005 (n cases=321; n control=321).

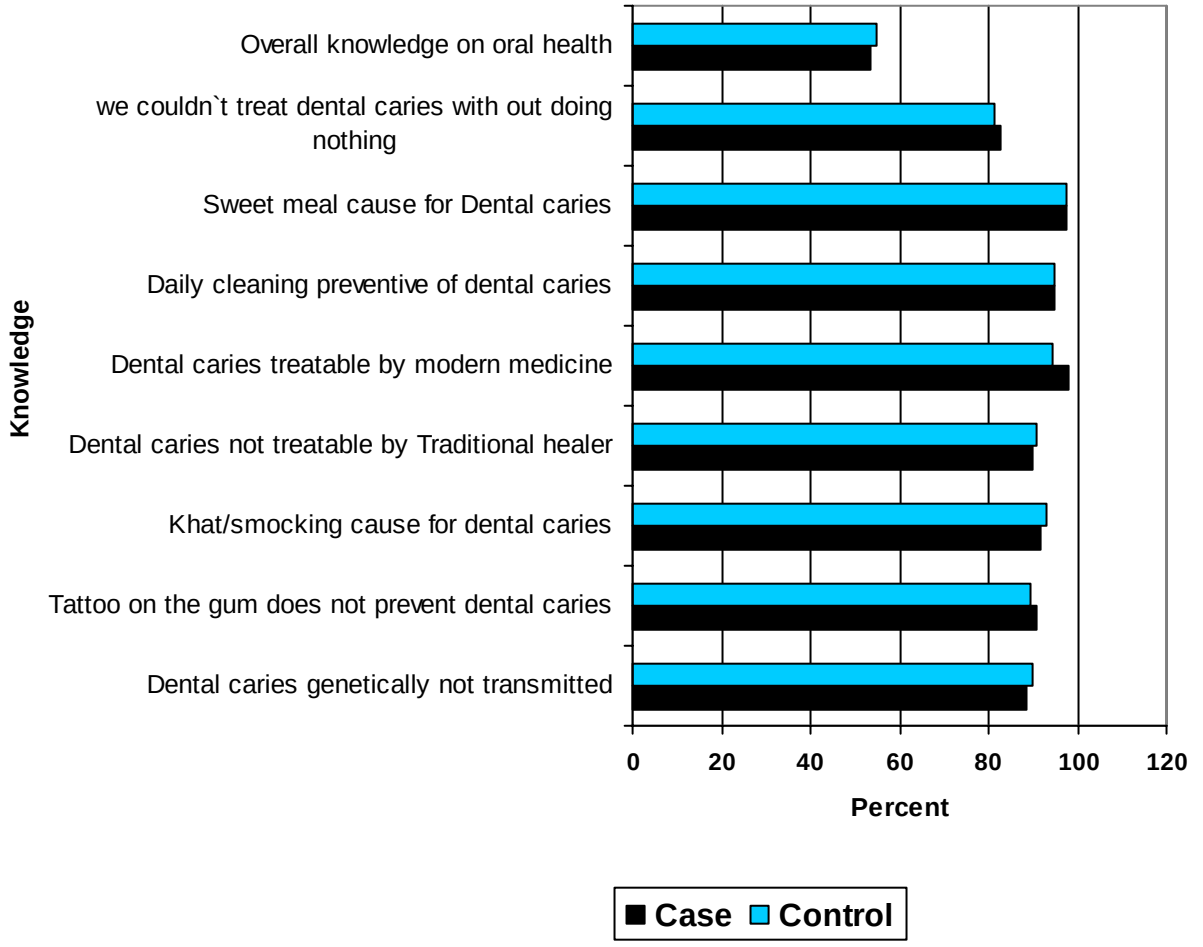
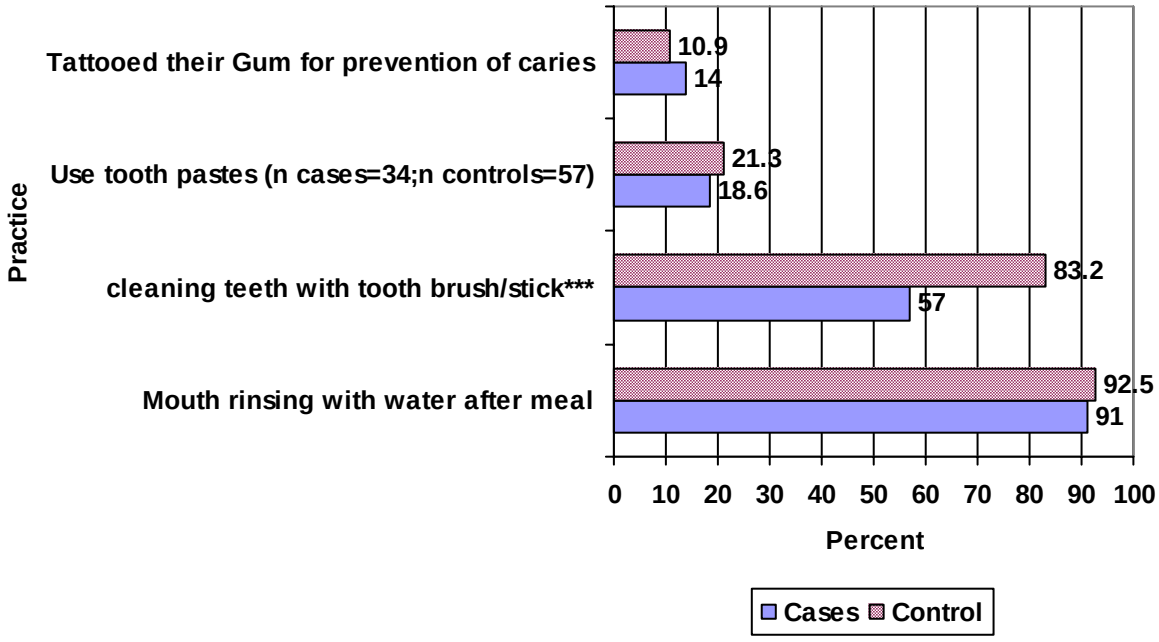


Fig III Comparison of practice on prevention for dental caries between cases and controls of dental caries of Core 105 Ethiopian Army, May 2005 (n= 321 each).



*** Significant differences between cases and controls of dental caries P<0.0001.

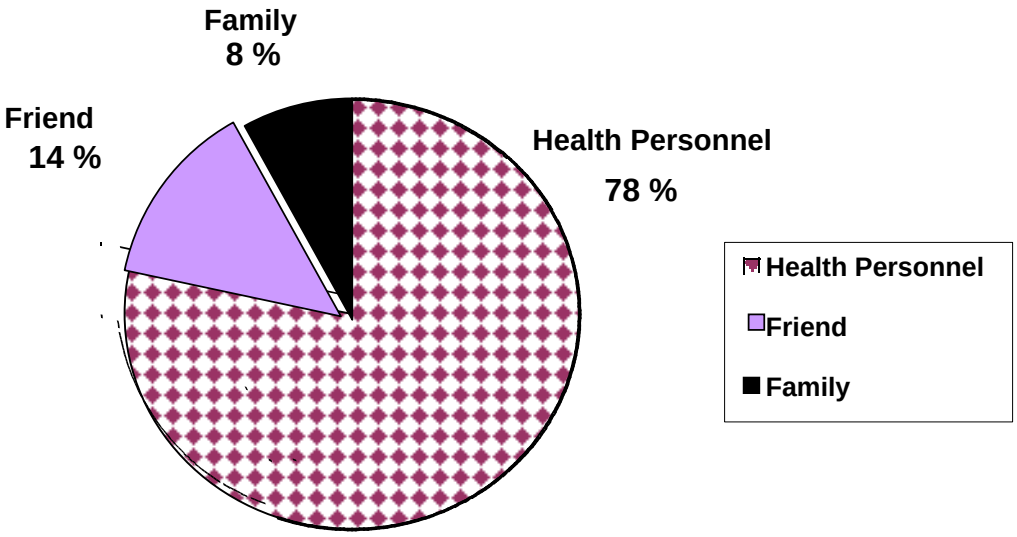
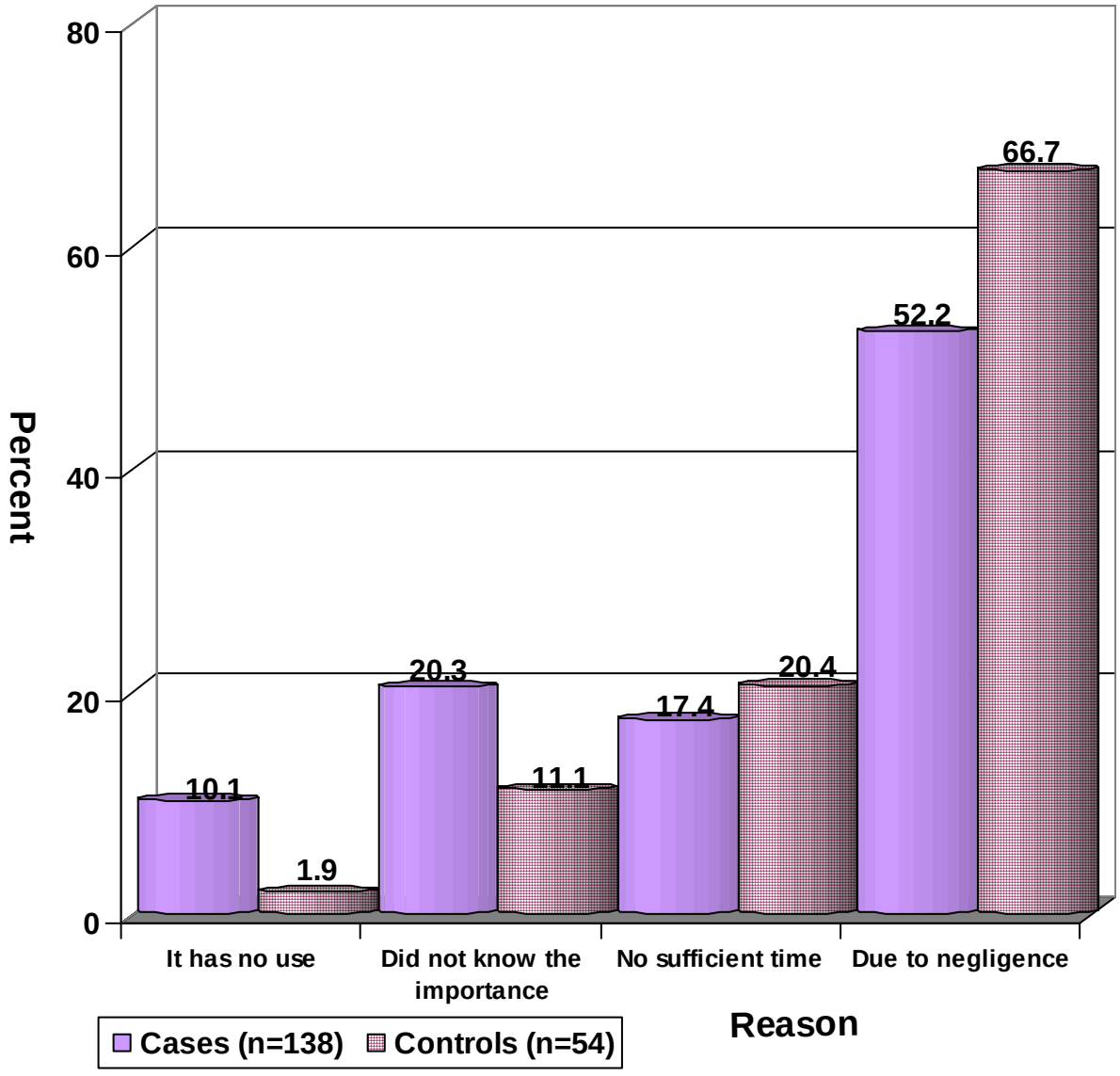


Fig. IV Sources of information about dental caries and oral hygiene Of Core 105 Ethiopian Army, May 2005(n=642)

Fig. V Reported reasons for not cleaning the tooth by those military personnel Who did not clean their teeth in Core 105 Ethiopian Army, May 2005



5.4 Socio-demographic characteristics and dental caries

Comparison of socio-demographic factors between cases of dental caries and their controls was made crudely; there was no significant difference between cases and controls no difference in age, rank, marital status, educational status, ethnicity, religion, and birth place. However, dental caries was found to be higher among those who joined military services in 1990 and after1990 E.C, than those who joined the military services before 1990 E.C (OR= 1.75, 95 % CI 1.08, 2.83)). More cases claimed that they were grow in rift valley areas of the country as compared to controls, and this differences was statistically significant (crude OR=2.02 95 % CI 1.15, 3.56) (Table III).

Table III. Comparison of odds of socio-demographic characteristics among cases and Controls of study participants in Core 105 Ethiopian Army, May 2005

Characteristics	Cases (%)	Controls (%)	Crude OR (95 % CI)
Age (years)			
20-29	229 (71.3)	242 (75.4)	1.00
30 and more	92 (28.7)	79(24.6)	1.23 (0.87, 1.75)
Marital status			
Never married	127 (39.6)	117 (36.4)	1.00
Married	194 (60.4)	204 (63.6)	0.88 (0.64, 1.21)
Educational status			
Elementary	235 (73.2)	245 (76.3)	1.00
Secondary or more	86 (26.8)	76 (23.7)	1.18 (0.83, 1.69)
Ethnicity			
Amhara	78 (24.3)	64 (19.9)	1.33 (0.88, 2.01)
Oromo	123 (38.3)	126 (39.3)	1.07 (0.75, 1.51)
Others	120 (37.4)	131 (40.8)	1.00
Religion			
Orthodox Christ.	229 (71.3)	237 (73.8)	1.00
Muslim	57 (17.8)	56 (17.4)	1.05 (0.70, 1.59)
Other Christ.	35 (10.9)	28 (8.7)	1.29 (0.76, 2.20)
Year of Employment			
Before 1990 E.C	30 (9.3)	49 (15.3)	1.00
1990 or After 1990 E.C	291 (90.7)	272 (84.7)	1.75 (1.08, 2.83)
Place of birth			
Urban	130 (40.5)	139 (43.3)	1.00
Rural	191 (59.5)	182 (56.7)	1.12 (0.82, 1.54)
Area of growth			
Outside rift valley	301 (93.8)	283 (88.2)	1.00
Rift valley	20 (6.2)	38 (11.8)	2.02 (1.15, 3.56)

5:5 Comparisons of, Cases and Controls for life style, and dietary pattern

Comparison of life style characteristics and dietary pattern between cases and their controls were made crudely ;there was no significant difference between cases and controls based on differences in their staple diet and consumption of alcohol ,but there was a difference between cases and controls with regards to khat chewing and cigarette smoking habits: The odds of khat chewing habits was higher among cases of dental caries than among controls, (Crude OR=1.41 with 95 % C.I (1.03, 1.93).The odds of cigarette smoking was higher among cases as compared to controls, (Crude OR=1.37 with 95 % C.I (1.00, 1.88).

The usual consumption of sweet food like cookies, cakes, etc; was higher among cases of dental caries than it was among controls (Crude OR =1.59 with 95 % CI 1.16, 2.17), but there was no significant difference in habit of drinking beverages/tea and coffee with sugar between cases and controls. Sugared drinks were scored (Annex E) according to the frequency of intake of tea and coffee with sugar and/or soft drinks. (Table IV)

Table IV Comparison of odds of cases and Controls for Life style characteristics and dietary Pattern of Core 105Ethiopian Army May 2005.

Characteristics	Cases (%)	Controls (%)	Crude OR (95 % CI)
Khat chewing habit			
Never chew	126 (39.3)	153 (47.7)	1.00
Chew	195 (60.7)	168 (52.3)	1.41 (1.03, 1.93)
Cigarette Smocking habit			
Never smock	136 (42.4)	112 (34.9)	1.00
smock	185 (57.6)	209 (65.1)	1.37 (1.00, 1.88)
Alcohol drinking habit			
Never drink	266 (82.9)	262 (81.6)	1.00
drink	55 (17.1)	59 (18.4)	1.09 (0.73, 1.63)
Bread as major stable food			
No	20 (3.1)	25 (3.9)	1.00
Yes	301(50.4)	296 (46.1)	0.79 (0.43, 1.44)
Enjera as major stable food			
No	243 (75.7)	244 (76.0)	1.00
Yes	78 (24.3)	77 (24.0)	1.02 (0.71, 1.46)
Intake of Sugared drinks*			
Low	14 (4.4)	24 (7.5)	1.00
High	307 (95.6)	297 (92.5)	1.77 (0.90, 3.50)
Frequent intake of sweat food			
No	139 (43.3)	176 (54.8)	1.00
Yes	182 (56.7)	145 (45.2)	1.59 (1.16, 2.17)

* Refer Annex E.

5:6 Comparisons of cases and control for presence of calculus, plaque and gingivitis

Among the study subjects, 145 (45.2 %) of cases, and 85 (26.5 %) of controls have calculus, and this difference was significant, (Crude OR=2.29, with 95 % CI, 1.64, 3.19).The odds of the detected gingivitis was higher among cases as compared to controls, crude (OR=1.82, with 95% CI., 1.16, 2.88).The likely of having plaque among the cases was higher than the controls, (Crude OR=1.39, with 95 % CI ,1.00, 1.92). (Table V)

Table V Comparison of cases and control for presence of calculus, plaque and gingivitis Core 105 Ethiopian Army May 2005.

Characteristics	Cases (%)	Controls (%)	Crude OR (95 % CI)
Presence of Calculus			
No	176 (54.8)	236(73.5)	1.00
Yes	145(45.2)	85(26.5)	2.29 (1.64, 3.19)
Presence of Gingivitis			
No	264(82.2)	303(94.4)	1.00
Yes	57(7.8)	18(5.6)	1.82 (1.16, 2.88)
Presence of Plaque			
No	188(58.6)	220(68.5)	1.00
Yes	133(41.4)	101(31.5)	1.54 (1.10, 2.16)

5:7 Determinants of dental caries

Comparison of variables that were statistically significant with dental caries on crude analysis were adjusted in table VI, and results showed that military personnel who were employed in 1990 E.C and after 1990 E.C had more dental caries than those who were enrolled into military services before1990 E.C (Adjusted OR=2.40 95% C.I=1.34, 4.23)

More cases claimed that they had been grown in rift valley area as compared to their controls this differences was statistically significant (Adjusted OR=2.14 95 % CI 1.16, 3.92). After adjusting for other variables the likelihood of having dental caries was higher among khat chewers than those who never chew khat, (Adjusted OR=1.89, 95 % CI 1.31, 2.75)

The odds of having dental caries was also higher among study participants who had the habit of usually consuming sweet food items than those who did not usually consuming sweet food items (Adjusted OR=2.55, 95 % CI 1.48, 4.39). Tooth cleaning practices were higher in controls as compared with cases of dental caries this difference was statistically significant after adjusting for age, year of employment, cigarette smoking, frequent consumption of sweet food, presence of calculus, gingivitis and plaque, (Adjusted OR=3.40 95 % CI 2.30, 5.02).

The presence of calculus, gingivitis and plaque in oral cavity was significantly associated with dental caries after adjusted for other variables. (Adjusted OR=2.07 95% C.I=1.44,

2.98), (Adjusted OR=1.69 95% C.I=1.03, 2.81) and (Adjusted OR=1.41 95% C.I= 1.00, 2.01) respectively.

After adjusted for age, year of employment, khat chewing habit, usual intake of sweet food, oral hygiene practices, and presence of calculus, gingivitis and plaque; there were no significant differences between cases and controls for age, cigarette smoking and alcohol drinking habits (Table VI).

Table VI Adjusted for determinant factors of dental caries among study participants of core 105 Ethiopian Army May 2005.

Characteristics	Cases (%)	Controls (%)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
Age				
20-29	229 (71.3)	242 (75.4)	1.00	1.00
30 or more	92 (28.7)	79 (24.6)	1.23 (0.87, 1.75)	1.14 (0.75, 1.74)
Year of employment				
Before 1990 E.C	30 (9.3)	49 (15.3)	1.00	1.00
After 1990 E.C	291 (90.7)	272 (84.7)	1.75 (1.08, 2.83)	2.40 (1.34, 4.23)**
Area of growth				
Outside rift valley	283 (88.2)	301 (93.8)	1.00	1.00
Rift valley	38 (11.8)	20 (6.2)	2.02 (1.15, 3.56)	2.14 (1.16, 3.92) **
Khat chewing habit				
Never chew	126 (39.3)	153 (47.7)	1.00	1.00
Chew	195 (60.7)	168 (52.3)	1.41 (1.03, 1.93)	1.89 (1.31, 2.75)**
Cigarette Smocking habit				
Never smock	136 (42.4)	112 (34.9)	1.00	1.00
Smock	185 (57.6)	209 (65.1)	1.37 (1.00, 1.88)	0.71 (0.48, 1.02)
Alcohol drinking habit				
Never drink	266 (82.9)	262 (81.6)	1.00	1.00
drink	55 (17.1)	59 (18.4)	1.09 (0.73, 1.63)	1.08 (0.69, 1.69)
Usual intake of sweat food				
No	139 (43.3)	176 (54.8)	1.00	1.00
Yes	182 (56.7)	145 (45.2)	1.59 (1.16, 2.17)	2.55 (1.48, 4.39)**
Tooth cleaning				
No	138 (43.0)	54 (16.8)	3.73 (2.58, 5.38)	3.40 (2.30, 5.02)**
Yes	183 (57.0)	267 (83.2)	1.00	1.00
Presence of Calculus				
No	176 (54.8	236 (82.2)	1.00	1.00
Yes	145 (45.2)	85 (26.5)	2.29 (1.64, 3.19)	2.07 (1.44, 2.98)**
Presence of Gingivitis				
No	264 (82.2)	287 (89.4)	1.00	1.00
Yes	57 (7.8)	34 (10.6)	1.82 (1.16, 2.88)	1.69 (1.03, 2.81)**
Presence of Plaque				
No	188 (58.6)	220 (68.5)	1.00	1.00
Yes	133 (41.4)	101 (31.5)	1.54 (1.10, 2.16))	1.41 (1.00, 2.01)**

** Significantly associated with dental caries after adjusted for Age, year of employment, Area of growth, Khat chewing habit, Cigarette Smocking habit, Alcohol drinking habit, usual intake of sweat food, Presence of Calculus, Presence of Gingivitis and Presence of Plaque

6. Discussion

This study has included military personnel having a high response rate, and this is may be due to the well informed consent, oral examination was under taken on voluntary bases, and appropriate arrangement was made by the local authority. This high response rate could minimize the differences that may exist between the sample and the parameter.

The study subjects have relatively high knowledge on oral health more over there was no difference in knowledge on oral health between cases and controls. This high knowledge among the military personnel could be due to the health education given, or it could be explained by higher education they have as compared with the general population.

Though the study group had high knowledge on oral health there are still people not practicing it, and this is in consistent to other studies that show knowledge alone could not change behavior of individuals (26). In this study, cleaning their teeth using tooth brush or local tooth stick was higher among controls as compared to cases, and the potential reason for this is as they claimed it was due to negligence.

The habit of not cleaning the teeth was found to be significantly associated with dental caries. Teeth cleaning have a protective effect as many studies agreed, but the frequency and method of cleaning has its own impact and contribution. Even though tooth cleaning is protective for dental caries the present study did not showed that applying tooth paste during cleaning of the tooth is protective. The possible explanation for this finding could be that tooth paste to be effective it depends on the frequency of using tooth past and the frequency of taking sweet food

items and also the efficiency of tooth pastes (10) The concentration of fluoride in the tooth pastes used by the study subjects could not be determined and in this study we did not assess also the frequency and the time when it was used so we failed to revealed the protective effect of the tooth paste could be due to the absence of relevant question in this study. Mouth rinsing with water after food was not found to be protective against dental caries similar result were also previously reported (13).

In our study, year of employments was found significantly associated with dental caries. Those recruited lately in 1990-1995EC were more affected than those who joined the military service before 1990 E.C. The former were younger than the later this was further to our knowledge there is no publication on this area the possible explanation for this finding that those who were employed lately were recruited with out screening for dental problem, this might be the mass recruitment of the militaries due to Ethio\ Eritrea war and they might have joined the military service after they had developed the caries; or it could be due to the diet consumed during the war like biscuit which is very hard and they call it ”Cochoro” however this finding needs further studies and explanations.

Grow in rift valley areas were a risk factor for the development of dental caries the possible explanation could be directly or indirectly related to the high fluoride level of the water in the area, may be flourotic teeth more liable to develop dental caries this is in agreement with other studies as studies has showed that there is a positive association between dental caries and dental fluorosis.(28).

This was in consistence with the result of previous studies (11, 16, and 17). Tea, coffee and soft drinks were not found to be associated with dental caries where as sweet foods items were found to be associated with dental cares. The possible explanation for this finding could be that fluids are less likely to stick on teeth, but the sweet food items are more likely to be retained and stick on oral cavity, and this was reported to favor the growth of bacteria and able to cause damage to the tooth surfaces (16, 17), and the other explanation could be Tea plant is known to accumulate fluoride which could tend to protect the teeth against dental caries (17, 28). As studies have shown (11, 14, and 17) dental caries has dose response relationship to sugar, but in our study, amount of sugar added to tea and coffee of the militaries were not quantified and this finding also needs farther studies and explanation.

Finding on the association between khat chewing and dental caries was found in agreement with other findings reported by other investigator. The previous study done in this country has showed that khat chewers take much sugar, tea and/or coffee with sugar when they chew Khat, which could have enhanced the association (16, 29); however it needs farther studies and explanation.

The higher frequency of presence of calculus, gingivitis and plaque were detected among cases as compared to controls. The association to the presence of calculus, gingivitis and plaque in the oral cavity and dental caries has also been documented by other studies in this country (16, 18). The possible explanation for this finding could be the presence of calculus, gingivitis and plaque have associations with oral hygiene, and this needs further study to elucidate whether the association is due to direct effect of oral hygiene or due to other mechanisms.

Religion, ethnicity, marital status, and rank, were not found to be associated with dental caries because they may not directly influence the occurrence of dental caries, rather it may be the individual behavior, habit and practice that has an effect on the development of dental caries. (14, 22)

6:1 STRENGTH

1. This study is the first in its kind in militaries in our country, and it could generate new ideas for farther studies.
2. The response rate of this study was high.
3. Training of dental technicians according WHO recommendation, and use of standardized measurement of dental caries is the other strength the study has.
4. Though life style is a sensitive issue to tell to others, use of self administered questioner and anonymous of their identity has prevented from losing information on those sensitive issues.

6:2 LIMITATIONS

1. In this study cases and controls were identified only with clinical caries, difficulty of radiological examination at field level could affect the actual results of this study.
2. Sweet food items and drinks were assessed by the usual patterns and/frequency of intake but, the amount and the duration of intake was not well assessed.
3. Lack of previous similar study made comparison difficult.
4. Females were few in number, so our study failed to show the relation of dental caries and sex.

7. Conclusion and Recommendation

7:1 Conclusion

1. Findings of this study showed that, the over all Knowledge and understanding of dental caries and its prevention among the military personnel were high.

2. Despite the higher Knowledge about oral health, tooth brushing was not still practiced by 30 % of the study participants.

3. Being employed in 1990 or after 1990 was found to be a risk factor for dental caries.

4. Growing in rift valley area is a risk factor for the development of dental caries.

5. The higher frequency of presence of calculus, gingivitis and plaque were associated with increased risk of dental caries.

6. The staple diet of the militaries was not found to be a risk factor for dental caries but the usual consumption of sweet food items like cookies was found to be a risk factor for dental caries.

7. Khat chewing habit was also found to be a risk factor for dental caries.

7:2 Recommendations

1. Promotion of good oral hygiene practices through Health education about practicing adequate and effective techniques of tooth cleaning should be reinforced in Army.

2. Initiation and strengthening of the screening program for the new militaries.

3. Providing materials used for oral health, like tooth pastes/ brush for lower cost.

4. Early detection and treatment of newly developed dental caries, calculus, gingivitis, and plaque.

5. Arranging a regular program for inspection of the oral cleanness of the militaries and as the same time to encourage them to practices oral hygiene.

6. The results of this study help the Health Command and other concerned bodies to design effective intervention and strategies to improve the oral health of the militaries.

7. Start to celebrate oral health day to give more emphasis and to initiate the militaries.

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Annex: -A

Addis Ababa University Department of Community Health

Questionnaire related to dental caries prepared for military personnel

Adapted from similar studies

01. Questionnaire identification number_____
02. Year of conducted _____
03. Core_____
04. place_____

041division

042catagory

1= core staff 2=infantry 3=mechanized

Introduction: - "My name is _____ I am working for the Defense University we administered this Questionnaire here in the _____ Mechanized / Infantry Division in order to find out the causes of dental caries and its impact on health services.

Therefore, this includes very personal questions your answer is strictly confidential, your name will not be written on this form and, will never be used in connection with any information you tell us. You do not forced to answer any questions that you do not want to answer, and you may be able to interrupt to answer this question any time you want. However, your honest answer to these questions will help us for better understanding about causes of dental caries its problem, and for future planning of the preventive services. We would greatly appreciate your help by responding to these questions. To finished this questionnaire it will take about ____minutes

Would you willing to participate?

1. Yes _____
2. No _____

Thank you!!

Date_____

Questionnaire Form **Identification .No ____**

Section-1 A .Sociodémographiques Information			
S. No	Question	Option/ answers	Code
101	Age	[ ] [ ]	
102	Sex.	1. Male 2. Female	
103	Militari Rank	1. Non officier 2. Privat 3. Junior officier 4. Higher officier	
104	Brigade	_____	
105	Battalion	_____	
106	Year of Employement	_____	
107	Educational Background	1. primary school 2. secondery school 3. under graduate 4. Graduate	
108	Ethnicity	1. oromo 2. Amahara 3. Tigeri 4. Guragae 5. Others (specify)_____	

109	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others(specify)_____	
110	Marital Status	1. Singel 2. Married 3. Divorced 4. Widowed	
111	Place of born	1. Addis Ababa 2. Out of Addis Ababa urban 3. Out of Addis Ababa rural	
112	Did you grow in one of these areas? (Natherate, Awassa, Wonge, Zeway Arba Minch.)	1. Yes 2. No	
113	Do you chew Khat?	1. Yes 2. No /to 115/ 3. I used to chew khat before	
114	If yes, How often did you chew khat?	1. Daily 3. 2-3days per Week 4. once a week 5. others _____	

115	Do you smoke cigarette?	1. Yes 2. No /to 117/ 3. I used to smoke but not now	
116	If yes, How many cigarettes do you smoke per day?	[_____]	
117	Do you have Alcohol drinking habits?	1. Yes 2. No /to120/ 3. I used to drink alcohol but not now	
118	If yes, How often did you drink Alcohol?	1. Usually/daily to weekly/ 2. Sometimes Occasionally 3. Occasionally 4. others_____	
119	What was the status of your parents/relatives when they compared with their neighbors?	1. Poor 2. Moderate 3. Rich	
120	Did your parents have caws or camels?	1.Yes 2. No	

Section: - 2 Information on food habits

S.N	Questionnaire	Response category	Code
201	What type food do you eat usually for Breakfast? (For the last one month) (Circle that apply)	1. Bread 2. Biscuit 3. Injera \ Wot or firfir\ 4. Kinchie 5. pourage 6. Other (Specify)_____	
202	What kind of food do you eat usually for Lunch? (For the last one month) (Circle that apply)	1. Bread 2. Biscuit 3. pasta 4. Injera \Wot or firfier\ 5. Kinchie 6. pourage 7. Other (Specify)_____	
203	What food do you usually eat for dinner? (For the last one month) (Circle that apply)	1. Bread 2. Biscuit 3. pasta 4. Injera \Wot or firfier\ 5. Kinchie 6. pourage 7. Other (Specify)_____	
204	Do you drink sugared tea?	1. Yes 2. No /to 206/	
205	If yes, how many caps of tea do you drink in a day?	Number of caps _____	

206	Do you Drink sugared Coffee?	1. Yes 2. No /to 208/	
207	If yes, how many caps of Coffee do you drink in a day?	Number of caps _____	
208	Do you take soft drinks?	1. Yes 2. No /to 210/	
209	If yes, how many soft drinks do you drink in a week?	Number of caps _____	
210	Do you eat sweat food staff like Cake, Cookies, Biscuit and Others?	1. Yes 2. No /to 212/	
211	If yes, how many times do you take in a week?	1. Daily 2. 2-3days in a week 3. Once a week 4. sometimes 5. others_____	
212	Do you used to drink milk during your child hood?	1. No ,I don't 3. Occasionally 4. Usually /daily to weekly/	

Section 3: - Knowledge, and practice about dental caries and its Prevention			
S. No	Questions	Response category	Code
01.	Have you ever heard of dental caries?	1. Yes 2. No	
02.	Have you ever have dental caries?	1. Yes 2. No	
03.	What are the major symptoms/ problems encountered? (Circle that apply)	1. Sever pain 2. Cosmetic problem 3. Bad smelling 4. Bleeding 5. Swelling 6. Don't know	
04.	If you have dental ache, where did you go?	1. To a health institution 2. To a pharmacy 3. To traditional healer 4. No where 5. Other (specify)____	
05.	If you go to health institution what was your reason to visit the dentist?	2. For tooth extraction 3. For tooth filling 4. For cleaning teeth 5. For reliving pain 6. Others (specify)___	

06.	Do you clean your teeth using tooth brush/ chewing stick on daily basis?	1.Yes /to308/ 2. No	
07.	If No, what is your reason for not cleaning your teeth?	2. No use 3. I don't know the importance 4. No time 5. Negligence 6. Others (specify)_	
08.	If yes, do you use toothpaste?	1. Yes 2. No	
09.	Do you have mouth-rinsing habit after food?	1. Yes 2. No	
10.	Have you tattooed your gum in order to prevent dental caries?	1. Yes 2. No	
11.	Do you agree that pain of dental caries is one of the sever pains human beings tolerate?	1. Agree 2. Neutral 3. Disagree	
12.	Do you agree to advice a person with dental caries to go to a traditional healer?	1. Agree 2. Neutral 3. Disagree	
13.	Do you agree to tell people to tattoo their gum so they will not develop dental caries?	1. Agree 2. Neutral 3. Disagree	

14.	Do you know that dental caries is transmittable genetically?	1. Yes 2. No	
15.	Could absence of tattoo on the gum result in dental caries?	1. Yes 2. No	
16.	Could khat chewing/ cigarette smocking almost everyday result in dental caries?	1. Yes 2. No	
17.	Are we able to treat a dental caries by going to a traditional healer?	1. Yes 2. No	
18.	Are we able to treat a dental caries by doing nothing?	1. Yes 2. No	
19.	Are we able to treat a dental caries by going to a modern medical institution?	1. Yes 2. No	
20.	Are we able to prevent dental caries by daily cleaning using toothbrush or chewing stick?	1. Yes 2. No	
21.	Are we able to prevent dental caries by not taking much sweaty meals?	1. Yes 2. No	
22.	Are we able to prevent dental caries by extracting milk tooth during childhood?	1. Yes 2. No	
23.	Has any one told you to keep your teeth clean?	1.Yes 2. No	
24.	If yes, Who told you?	1.Health personnel 2.Friend 3.Family	

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£ºî~ †ºmli ŒÙG

lPW"pı £¼Y^ LoYoY L}a•v †\LGŒs EMėªT· ¼~r £dTlå Lº¨jv

01. የመጠይቁ መለያ ቁጥር ___________

02. መጠይቁ የተካሄደበት ዓ/ም _________

03. ኮር __________

04. ቦታ __________

<u>መግቢያ</u>:- ይህ ጥናት የሚካሄደው በአዲስ አበባ ዩንቨርስቲና በመከላከያ ዩንቨርስቲ ፍቃድና አስተባባሪነት ነው:: የጥናቱ ዓላማ የጥርስ መቦርቦር/መበስበስ መነሻ ሊሆኑ የሚችሉ ምክንያቶችን ለማወቅ ነው:: ይህም ለህክምና አገልግሎቶች ዕቅድ ለሚያወጡ የመነሻ ሃሣብ ለመስጠትና የመከላከያ መንገዶችን ለመጠቆም ይሆናል::

በዚህ ጥናት ጊዜ _________ሜካናይዝድ/እግረኛ/ክፍለጦር______ብርጌድ______ ባታሊዎን በእጣ ተመርጠው በጥናቱ ፍቃደኛ የሆኑትን ሰዎች የጥርስ ምርመራ በማድረግና የተዘጋጁትን መጠይቆች በተሣታፊዎቹ እንዲሞሉ /እንዲመለሱ/ በማድረግ ይካሄዳል::

ሚስጥራዊነት እና ስምምነት /ፈቃደኝነት/

የሚሰጡት ምላሽም ሆነ የጥርስ ምርመራ ውጤትዎ በፍፁም ሚስጥራዊ ነው:: ስምዎም በፎርሙ ላይ አይፃፍም እናም ከማንኛውም መረጃ ጋር ተያይዞ ሊቀርብ አይችልም:: መመለስ የማይፈልጉትን ጥያቄ ያለመመለስ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው:: ነገር ግን ለጥያቄው እርስዎ የሚሰጡት እውነተኛና ትክክለኛ መልስና በምርመራው መሣተፍዎ ስለበሽታው መንስኤዎች ትክክለኛ ግንዛቤ እንዲኖረን በጣም ይጠቅመናል::ለጥያቄዎቹ ስለሚሰጡት መልስና ተመርምረው ስለመሳተፍዎ አድናቆታችን በጣም ከፍተኛ ነው:: ጥያቄው -------------- ምርመራው -------- ያህል ጊዜ ይወስዳል:: ስለዚህ በምርመራውና በጥያቄው ለመሳተፍ ፍቃደኛ ኖት?

1 አዎ ______

2 አይደለም ________

LG\å †•¿ ŠD} £¼Y^ NYLW'å¿~ Lº¨e¿ L LåFr ¨d¼Eå::

ክፍል አንድ ማህበራዊና ስነህዝባዊ

ተ.ቁ	መጠይቅ	መልስ	ኮድ
101	እድሜ	1. _____ ዓመት	
102	ፆታ	1 ወንድ 2 ሴት	
103	ወታደራዊ ማዕረግ	1 ባለሌላ ማአረግ 2 ተራ ወታደር 3 መስመራ" መኮንን 4 ከፍተኛ መኮንን	
104	ብርጌድ	[_____]	
105	ባታሊዮን	[_____]	
106	የቅጥር ዘመን /ዓመት/	[_____] ዓ.ም	
107	የትምህርት ደረጃዎ	1. አንደኛ ደረጃ 2. ሁለተኛ ደረጃ 3. ዲፕሎማ 4. ዲግሪ ምሩቅ 5. ድህረ ምሩቅ	
108	ብሔረሰብ	1. ኦሮሞ 2. አማራ 3. ትግሬ 4. ጉራጌ 5. ሌላ ካለ ይገለፅ _____	
109	ሐይማኖት	1. ኦርቶዶክስ 2. እስልምና 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይገለፅ ————	
110	የጋብቻ ሁኔታ	1. ያገባ 2. ያላገባ 3. የፈታ 4. ባለቤቱ የሞተበት	

111	**የተወለዱበት ቦታ**	**1. አዲስ አበባ** **2. ከአዲስ አበባ ውጭ ከተማ** **3. ከአዲስ አበባ ውጭ በገጠር**	
112	**ከዚህ በታች ከተዘረዘሩት** /£^N¼ `Ej/ **አገሮች ውስጥ ተወልደው አድገዋል**? /**ናዝሬት፣ ወንጂ፣ አዋሳ፣ ዝዋይ፣ አርባምንጭ፣** †"b፣ LG‹ 'TY/	**1. አዎ** **2. አይደለም**	
113	**ጫት ይቅማሉ**?	**1. አዎ እቅማለሁ** **2. ቅሜ አላውቅም/ወደ 115/** **3. በፊት እቅም ነበር**	
114	**/መልስዎ አዎን ከሆነ/ በሣምንት ስንት ጊዜ ይቅማሉ**?	**1. በቀን በቀን** **2. በሣምንት 2-3** d~r **3. በሣምንት አንድ ቀን** **4. ሌላ ካለ ይግለፁ** _____-	
115	**ሲጋራ ያጨሳሉ**?	**1. አዎ** **2. አይደለም /ወደ 117/** **3. በፊት አጨስ ነበር**	
116	**/መልስዎ አዎ ከሆነ/** I†M‹„ **በቀን ምን ያህል ሲጋራ ያጨሳሉ**?	[_____]	
117	**አልኮል መጠጥ ይጠጣሉ**?	**1. አዎ** **2. አይደለም /ወደ 119/** **3. በፊት እጠጣ ነበር**	
118	**/መልስዎ አዎን ከሆነ/** I†M‹„ **በየስንት ጊዜው አልኮል መጠጥ ይጠጣሉ**?	**1. አዘውትሬ እጠጣለሁ /በቀን በቀን ወይም በሣምንት/** **2. አልፎ አልፎ እጠጣለሁ** **3. የተለየ ፕሮግራም ሲኖር** **4. ሌላ ካለ ይግለፁ** _____	
119	**የቤተሰብዎ የኑሮ ደረጃ ከአካባቢው ሰውና ከጐረቤቶቻችሁ ጋር ሲወዳደር ምን ይመስላል**?	**1.** ªA **2.** L‹ŠE*f* **3. ሀብታም**	
120	**ወላጆችዎ /ቤተሰቦችዎ/ ላም ወይም ግመል ነበሩዋቸው**?	**1. አዎ** **2. አይደለም**	

ክፍል ሁለት የአመጋገብ ልማድ መረጃ

ተ.ቁ	መጠይቅ	መልስ	ኮድ
201	አዘውትረው ቁርስ የሚመገቡት ምንድን ነው? /ባለፈው አንድ ወር ጊዜ/ (Š†¿ IF¨ LG^ MŒln ¨uFG)	1. ዳቦ 2. n^Šår / wZ/ 3. ¸^q /L Z}¡/ 4. ^¿¯W /l '¼/ ÙYÙY/ 5. ቅንጬ 6. ገንፎ 7. ሌላ ካለ ይገለፅ ————	
202	አዘውትረው ምሳ የሚመገቡት ምንድን ነው? /ባለፈው አንድ ወር ጊዜ/ (Š†¿ IF¨ LG^ MŒln ¨uFG)	1. ዳቦ 2. n^Šår / wZ/ 3. Ü^q /L Z}¡/ 4. ^¿¯W /l '¼/ÙYÙY/ 5. ቅንጬ 6. ገንፎ 7. ሌላ ካለ ይገለፅ ————	
203	አዘውትረው እራት የሚበሉት ምንድን ነው? /ባለፈው አንድ ወር ጊዜ/ (Š†¿ IF¨ LG^ MŒln ¨uFG)	1. ዳቦ 2. n^Šår / wZ/ 3. Ü^q /L Z}¡/ 4. ^¿¯W /l '¼/ ÙYÙY/ 5. ቅንጬ 6. ገንፎ 7. ሌላ ካለ ይገለፅ ————	
204	ሻይ በስኳር ይጠጣሉ?	1.አዎ 2. አይደለም /ወደ 206/	

205	**/መልስዎ አዎ ከሆነ/ ስንት ስኒ በቀን ይጠጣሉ?**	**[_____]**	
206	**ቡና በስኳር ይጠጣሉ?**	**1. አዎ** **2. አይደለም /ወደ 208/**	
207	**/መልስዎ አዎ ከሆነ/ ስንት ሲኒ በቀን ይጠጣሉ?**	**[_____]**	
208	**ለስላሳ መጠጥ ይጠጣሉ? /ሚሪንዳ፡ ኮካኮላ፡ ፋንታ፡ እስፕራይት፡ ፔፕሲና የመሳሰሉትን/**	**1. አዎ** **2. አይደለም /ወደ 210/**	
209	**/መልስም አዎ ከሆነ/ I†M‹„ በሣምንት ስንት ጠርሙስ ለስላሳ ይጠጣሉ?**	**[_____]**	
210	**ጣፋጭ ምግቦችን ይበላሉ? /ኬክ፡ ብስኩት፡ ቸኮሌት እና የመሳሰሉትን/**	**1. አዎ** **2. አይደለም /ወደ 212/**	
211	**/መልስዎ አዎ ከሆነ/ በየስንት ጊዜ ይበላሉ?**	**1. በቀን በቀን** **2. በሣምንት 2 - 3 ጊዜ** **3. በሣምንት አንድ ጊዜ** **4. አልፎ አልፎ** **5. ሌላ ካለ ይግለፁ**	
212	**በልጅነትዎ ወቶት ይጠጡ ነበር?**	**1.አልጠጣሁም** **2.አልፎ አልፎ እጠጣ ነበር** **3. አዘውትሬ እጠጣ ነበር**	

ክፍል ሦስት ስለ ጥርስ መቦርቦር/መበስበስና ስለመከላከያው ያለ ግንዛቤና ልምምድ መረጃ/

ተራ ቁ.	መጠይቅ	መልስ	ኮድ
301	የተቦረቦረ/የበሰበሰ ጥርስ ኖርዎት ያውቃል?	1. አዎ 2. አይደለም	
302	የጥርስ ህመም ኖሮዎr የሚያውቅ ከነበረ ለህክምና ወዴት ሄዱ?	1. ወደ ጤና አገልግሎት 2. ወደ መድኃኒት ቤት 3. ወደ ባህላዊ ህክምና 4. ሌላ ካለ ይግለፁ——————— 5. የጥርስ ህመም ኖሮኝ አያውቅም	
303	ወደ ጤና አገልግሎት ከሆነ የሄዱት የሄዱበት ምክንያት ለምን ነበር?	1. ጥርስ ለማስነቀል 2. ጥርስ ለማስሞላት 3. ጥርስ ለማፅዳት 4. ስቃዩን ለማስታገስ 5. ሌላ ካለ ይግለፁ ———————	
304	ጥርስዎን በጥርስ ብሩሽ/በእንጨት መፋቂያ በየቀኑ ያፀዳሉ?	1. አዎ (ወደ 308) 2. አይደለም	
305	መልስዎ አይደለም ከሆነ የማያፀዱበት ምክንያት ምንድነው?	1. ምንም ጥቅም ስለሌለው 2. ጥቅሙን ስለማላውቀው 3. ጊዜ ስለሌለኝ 4. በቸልተኝነት 5. ሌላ ካለ ይግለፁ ———————	
306	መልስዎ አዎ ከሆነ ጥርስዎን ሲያፀዱ የጥርስ ሳሙና ይጠቀማሉ?	1. አዎ 2. አይደለም	
307	ከምግብ በኋላ ጥርስዎን †š'år T'å l'åB ¨µå L º L »Eå?	1. አዎ 2. አይደለም	

308	ጥርስዎን ከጥርስ መቦርቦር/መበስበስ ለመከላከል ጥርስዎን ተነቅሰው ያውቃሉ?	1. አዎ 2. አይደለም	
309	የጥርስ ህመም የሰው ልጆች ከሚችሉት አንዱና ከፍተኛው ህመም/ስቃይ }'ል። ይስማማሉ ?	1. እስማማለሁ 2. መስማማትም አለመስማማትም አልችልም 3. አልስማማም	
310	እጥርስ መቦርቦር/መበስበስ ያለውን ሰው ወደ ባህላዊ ህክምና እንዲሄዱ በመምከር ይስማማሉ?	1. አስማማለሁ 2. መስማማትም አለመስማማት አልችልም 3. አልስማማም	
311	ሰዎች ጥርሳቸውን ከተነቀሱ የጥርስ መቦርቦር/መበስበስ ሊያጋጥማቸው እንደማይችል በመንገር ይስማማሉ?	1. አስማማለሁ 2. መስማማትም አለመስማማት አልችልም 3. አልስማማም	
312	ስለጥርስ መቦርቦር/መበስበስ ስምተው ያውቃሉ?	1. አዎ 2. አይደለም	
313	ሊያስከትል የሚችለ'ል ከፍተኛ ችግር ወይም ስሜት ምንድነው?	1. ከፍተኛ ህመም/ስቃይ 2. የውበት ችግር 3. መጥፎ ሽታ 4. መድማት 5. እብጠት 6. አይታወቅም	
314	የጥርስ መቦርቦር /መበስበስ በዘር ሊተላለፍ ¨ vFG?	1. አዎ 2. አይደለም	

315	ጥርስን አለመነቀስ የጥርስ መቦርቦር/መበስበስ ምክንያት ሊሆን ይችላል?	1. አዎ 2. አይደለም	
316	አዘውትረው በየቀኑ ጫት መቃም/ሲጋራ ማጨስ የጥርስ መቦርቦር/መበስበስን ሊያስከትል ይችላል?	1. አዎ 2. አይደለም	
317	የጥርስ መቦርቦርን/መበስበስን ወደባህላዊ ህክምና በመሄዱ ማዳን እችላለን?	1. አዎ 2. አይደለም	
318	ይጥርስ መቦርቦር/መበስበስ ምንም ሳናደርግ ማዳን እንችላለን?	1. አዎ 2. አይደለም	
319	የጥርስ መቦርቦር/መበስበስ ወደ ዘመናዊ ህክምና በመሄድ ማዳን እንችላለን?	1. አዎ 2. አይደለም	
320	ጥርሳችንን በየቀኑ በጥርስ ቡሩሽ/በእንጨት መፋቂያ በማፅዳት የጥርስን መቦርቦር/መበስበስ መከላከል እንችላለን?	1. አዎ 2. አይደለም	
321	ብዙ ጣፋጭ ምግቦችን ባለመብላት የጥርስ መቦርቦርን/መበስበስን መከላከል እንችላለን?	1. አዎ 2. አይደለም	
322	የጥርስዎን ንፅህና እንዲጠብቁ የነገሮት ሰው አለ?	1. አዎ 2. አይደለም	
323	መልስዎ አዎ ከሆነ ማን ነገሮት?	1. የጤና ባለሙያ 2. ጓደኛ 3. ቤተሰብ 4. ሌላ ካለ የግለፁ_____	

Annex: - B

Dental caries assessment form

(Adopted from WHO oral health assessment form 1986).

Date _____ ID number ☐☐☐☐

Examiner _____

General information

Age in years ☐☐

Sex (M=1, F=2) ☐

Ethnic group ☐

Occupation ☐

Address

Brigade _____ Battalion _____

Dentition status

STATUS

Permanent

0 = Sound

1 = Decayed

2 = Filled & Decayed

3 = Filed no decay

4 = Missing due caries

5 = Missing any other reason

Annex:-C

OPERATIONAL DEFINITION

Clinical caries: _is defined as a cavity diagnosed by visual examination/probing of the mouth

Past caries: -past caries is manifested either by a filling or by loss of the tooth due to dental caries.

DMF:-_index per person: it is the average number of permanent teeth per person which are decayed, (**D**), Missing (**M**), Filled (**F)**because of caries it is a quantitative expiration the life time caries of expiration an individual.

Dentition status**:**

0-Sound tooth: - A tooth is recorded as sound if it shows no evidence of treated or untreated clinical caries

1-Filled tooth with decay: - A tooth is scored as filled with decay when it contain one or more permanent

3-Filled tooth with out decay: _A tooth is considered to be filled with out decay when one or more permanent restoration is present there is no secondary caries.

4-Tooth missing due to caries:-This score is used for permanent teeth that have been extracted because of caries.

5-Consumption patterns: - usual: any food item which is consumed once or more in a week.

6-Liefstyle; - Habit of taking alcohol, cigarette and khat.

7- Knowledgeable and non Knowledgeable: - Knowledge on oral health was assessed by eight Knowledge questions. The over all Knowledge was obtained by adding scores of eight knowledge questions. Those, who answered eight out of eight knowledge questions, were labeled as knowledgeable.

Annex:-D

Sample Size Calculation

The required sample size was calculated

Using sample size determination for case control study design.

The study will take the following assumption

Confidence Interval= 95%

Power = 80 %

Exposure (refined sweet) among cases of dental caries =60 %

Exposure (refined sweet) among controls=40 %

(5), to find a minimum odds ratio of 1.65. The formula below was used:

$$n= \frac{(Z \alpha_{/2} \sqrt{(}1+1/r) P (1-P) + Z \beta \sqrt{(P_1(1-p_1)+P_2 ((1-P_2)/r))^2}}{(p_1 - p_2)^2}$$

The minimum sample size require in each study groups will be= 298.

Adding 10%for possible non-response a total of 656 military personal were selected.

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Annex:-E

Drinks Scores

Items	**Labels**	**scores**
Tea with sugar	<7 Times/week	1
	7 times or more/week	2
Coffee with sugar	<7 Times/week	1
	7 times or more/week	2
Soft drinks	<7times/week	1
	7times or more/week	2

Total scores	**Drinks grading**
3 or less/ soldiers	=Low
4-5/ soldiers	=Moderate
6 or more /soldiers	=High

DECLARATION

I, the under signed, declared that this is my original work, has never been presented in this or any other university and that all source of material used for the thesis have been fully acknowledged

Name: Senait Mantegaftot.

Signature: _____

Place: -Addis Ababa University Department of Community Health

Date of Submission: May 25, 2005

This thesis has been submitted for exam with my approval as university Adviser.

Name Dr Nigussie Deyassa

Signature _____

Date May 25, 2005