Knowledge, attitude and practice and its associated factors towards dengue fever in Dire Dawa military camp, Ethiopia

Getahun Genssa, Dr Yosief Mamo, Aman Yesuf (MPH in Epidemiology, Assistant Professor), Col. Adisalem Mesfin(MPH in field Epidemiology)

Defence University College of health sciences post graduate mph program

Abstract:

Background: Dengue fever is a mosquito-borne infection that in recent decades has become an important global public health issue. It is most emerging infections in Eastern Ethiopia and can be fatal but preventable. Dengue has a significant impact on the health and readiness for combat of military personnel. Exploring the factors that affect behavior and practices on dengue among military populations is essential for implementation of effective prevention and controls interventions..

Objectives: To assess the knowledge, attitude and practice and its associated factors towards dengue fever in South Eastern Command, Dire Dawa military camps.

Materials and methods: A cross-sectional study was conducted among military personnel aged 18-52 years. A total of 296 participants were enrolled from February 8 to March 9, 2018 in Dire Dawa military camps and systematic sampling technique was applied. Pretested structured questionnaires were used .The collected data was entered to Epi data version3.1and exported in to SPSS version 20. Descriptive statistics such as percent, frequency, mean, SD, and proportion were used. Bivariate and multivariable logistic regression analysis was used to explore the association of dependent and independent variables.

Result: Overall poor knowledge were 138 (46.6%) with 95% CI (40.9-52.2), overall poor attitude level 108(36.5%) with 95%CI (30.7-41.9) and the participant's overall poor preventive practice 167(56.4%) with 95% CI (50.7-62.5). Main source of information was health personnel180 (60.9%). In multi variable logistic analysis the preventive practice was significantly associated with monthly income lessthan2000 birr were [AOR=6.754(1.624-

I

28.096)](p=0.009), monthly income between 20001-3000 were (p=0.028),3001-4000 were (p=0.047)and4001-5000 birr also were(p=0.006). Overall knowledge [AOR=2.346(1.319-4.172) (p=0.004) and overall attitude [AOR=2.249(1.198-4.224)(p=0.012), were 2 times more likely and health education less likely [AOR =0.072(0.031-0.167)(p<0.001) were significant associated with preventive practice.

Conclusion: This study found that overall good knowledge, good attitude But it was found that poor preventive practice of dengue fever. Factors associated with over all poor preventive practice in this study were monthly income; health education, knowledge, and attitude of participant's were significant associated with preventive practice. More emphasis must be given to health education can be given to more improve their awareness regarding dengue fever which can improve their poor preventive practice among military personnel's.

KEY WORDS: knowledge, Attitude, Dengue, Army personnel, preventive practice, associated factors

II

1. CHAPTER I INTRODUCTION

1.1. Background:

Dengue fever (DF) is an acute febrile disease due to a viral infection. Dengue virus infection caused by Aedes aegypti which is found in urban area and is causes significant morbidity and mortality worldwide. Although it is initially believed that an infection mainly affected the pediatric age group, this infection has been rapidly spreading across all age groups(1).Dengue fever is caused by any of four closely related viruses, or serotypes: DENV 1,2,3and 4. The agent causing dengue is a single-stranded RNA virus of flaviviridae family. The Aedes aegypti mosquito lives in urban habitats and breeds mostly in man-made containers. Unlike other mosquitoes Aedes aegypti is a day-time feeder; its peak biting periods are early in the morning and in the evening. The symptoms of infection is characterized by a sudden onset of high fever (38°c to 40°c), severe headache, backache, intense pain in joints and muscles, retro-orbital pain, nausea and vomiting and rash that usually begin 4-7 days after the mosquito bite and typically last 3-10 days(2).

The incidence of dengue has grown dramatically around the world in recent decades. The actual numbers of dengue cases are underreported and many cases are misclassified. One recent estimate indicates 390 million dengue infections per year, of which 96 million manifests clinically with severity of disease and 3.9 billion people, in 128 countries, are at risk of infection with dengue virus's serotype 2. Recovery from infection by one provides lifelong immunity against that particular serotype. However, cross-immunity to the other serotypes after recovery is only partial and temporary (3).

The epidemiology and public health effect of dengue in Africa is poorly understood, although the vectors of DENV are widely distributed .Dengue diagnosis is likely confounded by other diseases such as malaria and lack of laboratory diagnostic capability(4).

Dengue outbreaks were first reported in East Africa in the late 1970s to early 1980s. The available evidence so far indicates that DEN1, 2 and 3 appear to be common causes of acute fever East Africa including the 1982 outbreak on the Kenyan coast, DENV serotypes (1, 2 and 3) occurred in Mandera in northern Kenya ,DENV 1 and 2 outbreaks in the Comoros in various Years(1948 and later in 1983 and 1984) . Between 1977 and 1979 a major outbreak caused by dengue 2 was reported in the Seychelles Islands affecting >75% of the population and More recently in 2014, a dengue outbreak occurred in Tanzania (4).

In Ethiopia there is no report of dengue fever until the beginning of 2013.Since 2013; Ethiopia has reported more than 12,000 dengue fever cases. A confirmed Dengue fever case was reported for the first time in Ethiopia in Dire Dawa city in mid-September 2013. Suspected cases later reported from Gode town of Ethiopian Somali Region in January 2014 and in Afar Region 2014(5). Starting from 2014 to 2016 a total of 440 suspected cases were reported from Ethiopian Somali region in similar month that was January to March, this may shows that dengue outbreak was happening in cyclic ways and also the main preventive strategy is the awareness building in the community regarding the source reduction process(5).

1.2. Statement of the problem and Justification

According to WHO report, the incidence of dengue has grown dramatically around the world in recent decades. There is no specific treatment for dengue, but early detection and access to proper medical care lowers fatality rates below 1%. The number of dengue cases reported annually to WHO has increased from 0.4 to 1.3 million in the decade 1996–2005, it reached 2.2 million in 2010 and 3.2 million in 2015, also the incidence in Oct 2,2017 rises abut400 million dengue infection and 1.1 million DALYs globally(6).On April 2017,about 20,000 deaths are reported annually every year(7).

In Africa, dengue is an emerging disease and has caused major outbreaks in tropical and subtropical African related to urbanization growth. Regarding to WHO Africa report, the

expected DHF to DF ratio of 1% to 5% and thus, 0.2–1.0 million cases of DF could be expected to occur in Africa (8).

In Dire Dawa city administration, dengue is one of the most important emerging viral diseases that related to human habit of storing water in their homes leads to breeding of Aedes Aegypti mosquitoes. Furthermore, rainfall leads to artificial collection of water in discarded materials, cans, tires, and other water contain materials, increase temperature, urbanization like increase new construction in urban time to time were main favorable for vectors and causes dangerous of DF infections. Suspected DF cause was happened in January to March and May to August[(9) (21)].

On September 12, 2013 Dire Dawa town administration health bureau reported non malaria febrile cases of unknown etiology. All the cases were examined for malaria parasites by microscopy by health centers in Dire Dawa, but only an average of 7% were positive for one of malaria parasites while the patients were sick. The number of cases had grown and even doubled over the weeks. The regional health bureau carried out an outbreak investigation, but they could not identify the source and the underlying agent by local capacity and therefore requested the national team for further investigation accordingly, Ethiopian public health institution assigned a team of investigator for the emerging outbreak. A total of 11,409 suspected Dengue Fever cases with one death were identified from September /2013 to December 31/2013 were positive for DENV-2 serotype infection(9). and also 106 cases without death were reported in August2017(10).From September to January 2018 totally 459 suspected cases were reported from both Dire Dawa army clinics.

Also it is public health problems that could have devastating impact on the areas(11). Among four serotypes of dengue virus type-2 transmission was high in Eastern Ethiopia especially Dire Dawa city administration including military camps(12).

Knowledge towards emerging infectious organisms and mechanism of transmission is essential to prevent form spreading of dengue diseases. Lack of knowledge and practice about this ,lead to high risk of disease spreading causes increasing morbidity among military personnel in Dire Dawa military camps. Also the camps site were favor for the dengue transmission and mosquito proliferation and according to local clinics

3

observation , more than 320 suspected cases was observed in May to July 2017 and out of those 13 patients sample ,11were confirmed cases in June ,2017 and 459 suspected cases were recorded in army clinics from September to Jan 2018. This gives some clue that knowledge, attitude and practice were poor and showed less awareness and practice activities and also there is a little attention given to prevent and control DF disease among army personnel towards dengue fever.

There is no previous population based study done among army personnel to assess knowledge, attitude and practice to dengue fever, as this is important effort in designing anti DF intervention programs. And also the military personnel have gap of knowledge and understanding of the causes, transmission and preventive practice of the DF in Dire Dawa military and which impacts on health and combat readiness among army personnel.

Therefore, this study was focused on Knowledge, Attitude and practice and its associated factors towards dengue fever and the study was helps to effective preventive intervention of army health personnel related to DF.

1.3. Significance of the study

The study is useful for the army personnel and their family to evaluate and plan to increase knowledge and perception related to dengue fever in terms of prevention and control of the disease. Assist the army health office in the study areas to develop appropriate health education methods to improve army personnel's knowledge.

To provide Defence Main Health Director (DMHD) baseline information on Knowledge, attitude and practice among army personnel in eastern command in Dire Dawa military camp. The outcome of study will be used for future planing of preparedness against DF and also a tool for further prevention programs. Identify gaps in KAP which is useful to prepare relevant health education materials related to DF that can be used at local level. Through this, dengue fever will be controlled and prevented in the future.

4

1.4 .Research questions

What are the level of knowledge, attitude and practice towards dengue fever among military personnel?

Is there an association between independent variables and preventive practice of dengue fever among army personnel?

© GSJ

2. CHAPTER II LITERATURE REVIEW

2.1. Overview of dengue fever

Dengue virus infection has globally become emerging a major public health concern and the incidence of has increased more than 30-fold over the last five decades(13).WHO currently estimates that there approximately 500,000 requiring hospitalization per year. Of these severe dengue cases, approximately 5% will die and also CDC and Prevention, dengue fever endangers more than $1/3^{rd}$ of world population at risk(14).

Susceptibility of different strains of Aedes spp. mosquitoes to DENV has been shown to vary geographically, and this variability may have implications for DENV transmission and the epidemiology of the disease in Africa. During 1960–2010, a total of 22 countries in Africa reported sporadic cases or outbreaks of dengue; 12 other countries in Africa reported dengue only in travelers(15).

2.2. Knowledge towards dengue fever

A study conducted in Malaysia regarding knowledge showed that the majority 95.0% participants knew about the clinical presentation of dengue syndrome. The source of information given to them was television 97.0% followed by printed media and radio 74.3% and 63.7%, respectively. The least source of information was talks and seminars 29.7%(16).

A cross-sectional study carried out in Philippines showed that, more than half56.3% of the respondents had moderate knowledge, 43.7% had low knowledge, and none had great knowledge. Dengue viruses are transmitted to humans through bites of infective female Aedesaegypti 90%; regarding to symptoms dengue patients have chills, pain upon moving the eyes, and low backache 83%; and the only method of controlling dengue infection is to combat the vector mosquitoes79%. Mosquitoes that transmit dengue infection lay their eggs in dirty sewage water 15%, stored water containers for drinking water if not covered should be cleaned every 7 days 15%; the possibility of getting Dengue Fever if one of the family members has dengue fever 25%; and rainy season is

6

the only epidemic season for dengue infection 25% whereas regarding to the source of information ,friends 4.2%(17).

A Study done in Malaysia military cadet respondents answered those typical symptoms like fever for 3-5 days 95.1%, headache 92.3%, joint pain 91.8%, muscle pain 72.7%, and rashes 75.4. Antipyretics and antibiotics are medicines against dengue77% and 79.2%, respectively. The majority of the caused by a virus 85.5% and transmitted by Aede*s* mosquito bite 97.8%, mosquito usually bites either at sunset 92.3% or at sunrise 68.9%, dengue may be transmitted by blood transfusion 57.9% while 21.9% claimed that it can be transmitted through sexual intercourse(18).

A study conducted in Saudi Arabia showed that, 97.5% had heard about DF, 26.2% had positive family history of DF, Street advertisements as a source provided the DF information for 22% of the boys and 13.2% of the girls. About half 51% of the boys and 61% of the girls had heard about DF from more than one source(19).

A study carried out in India showed that, 83.3% were literates, 39.7% respondents said they are at risk of getting dengue. Around 11.4% said the mosquito is a day biter and 41.4% said it bites in both day and night,28.9% of the respondents said it breeds in pots, cans and water container, 57.3% said in Ponds and river, Source of information ,health personnel 15.4%(20).

A study carried out in Malaysia showed on symptoms of dengue, shivering 80.2%, nausea and vomiting 82.1%, pain behind the eyes 44.7%, back pain 44.9%, abdominal pain 32.4%, nasal bleeding 59.5%, skin rashes 60.9% and cough 47.7%. While 98% respondents knew that the vector for the dengue is a mosquito and most of them 92.8% aware that dengue is specifically caused by the Aedes mosquito ,breeding places for the mosquito were reported as uncovered water container 96.8%, pedestal flower pot 96.4%, abandon tire 96.1%, and uncovered pond 81.6%. Regarding medical management of DF most participants 88.5% choose consuming more water, having enough rest 77.2%, taking paracetamol 29% and traditional medicine 43.3% as a treatment for dengue fever(21).

The study done in south India showed that, 4.69% correctly knew about the biting habit of AedesAegypti whereas44.90% of respondents had correct knowledge regarding

breeding habit of Aedes mosquito. Strong and healthy person does not suffer from dengue24.49%. Elimination of larval breeding sources is a waste of time and very complicated 39.4%. Source of information, teachers 38.47%, family members 27.37%(22).Another study in India showed that,94% study participants has the opinion that environmental modification prevents dengue About the responsibility for vector control, 49% of the participants expressed that it must be a mutual responsibility between Government and individual(23).

2.3. Attitude towards dengue fever

A cross sectional study done in Thailand showed that, more than 64% of the respondents had positive attitudes toward community participation .Only 59.42% of agree insecticides to reduce the mosquito population (24).

A study conducted in India showed that, strongly agreed 50.7% and agreed 37.2% that DF is a serious illness, 80% of participants strongly agreed and 58.7% agreed that the disease is preventable, 90% believed that dengue can be prevented by controlling breeding sites of mosquitoes (25).

A study carried out in Malaysia, most of the respondents disagreed that the elimination of larvae was a complete waste of time 91.2%. They also disagreed that the prevention of dengue is the responsibility of the public health staff and local government 83.1% and fogging by the municipal council is essential enough for dengue prevention 68.2%(26).

Another study conducted in Malaysia showed that, total of 97.7% agreed that standing water from old tires, trash cans, and flower pots can be breeding places for mosquitoes, 98.4% believe that dengue can be prevented and controlled(27).

A study done in Cote d'Ivoire regarding attitudes revealed taht, 74% health workers agreed that dengue was serious illness and146 health workers who perceived the risk of dengue outbreak in Cote d'Ivoire (28).

2.4. Practices towards Dengue Prevention

A study carried out in Pakistan showed that ,96% of respondents were using multiple measures of protection,86% were wearing full sleeves and trousers, 70% were using

coils, 20% applied repellants, 22% used insecticidal sprays, 100% used fans, 12% screened their houses, 46% used bed nets, 88% covered water containers, 36% discarded waste items that can hold water. Thirteen percent checked flower pots/coolers for breeding of mosquito, 40% cooperated with others in maintaining clean environment. Overall practice about Dengue was 90% (29).A study conducted in Honduras in America showed that, 98.1% Kept their gardens and drains water 97.8%,54.1% used insect repellent or mosquito nets (30).

A study done in Central India showed that, spraying 35.12 %, clean house 31.22 %, clean dirty water 53.17 % and clean water storage jar / containers 17.56 %such as boxes, pots, cans, etc(31).Another study conducted in South India showed that ,breeding sites for mosquitoes 38% in plastic pots, muddy pots, vessels and coolers 24%, burrows and pits 14%, discarded tires 7% and stagnant water 11%. Among study participants the checking of the breeding sites was done regularly weekly in 36% and 48% irregularly 16% were never done, 33% were commonly using mosquito repellents, 21% respondents were not using any protective measures and others are using creams 7%, bed nets 12%.Almost all participants have the habit of using mosquito net. Nearly 94% covered water containers at home (32)

A study carried in Malaysia showed that,49.7% clean the houses, 41.3% eliminate stand water around the house, and 40.3% covers the water container in the home, used insecticide spray 33.6%, fans 38.6%, professional pest control 17.5%, and frequent change of stored water 26.2%.The mean practice of dengue is2.26 % (33).

A study carried out in Salvadoran Urban (USA) showed, an acceptable implementation of practices toward the prevention of mosquito reproduction 58.5% and a poor implementation to prevent mosquito bites 38.3%.Regarding the most important practices to prevent reproduction of mosquitoes according to the weight factor, almost all respondents eliminate standing water 89.1% and wash the water containers 84.5% but only few cover water containers 23.6%. Regarding to mosquito bite prevention practices the majority use bed nets 62.7% but only a low percentage of the interviewed households use screens in windows and doors 5.5%, most of the respondents used fans to prevent

9

mosquito bites 73.6%but other measures, as application of insecticides and repellents, are poorly used 35.5%and 33.6% respectively(34).

2.5. Associated factors towards dengue fever

A study carried out in Bangladesh showed that, there was significant association between age and practice p<0.031; post hoc test revealed that the knowledge score was statistically significant higher in age group 40-49 p=0.019 and the age group of 50-59 p=0.048 as compared to the age group of 20-29. Married has a significantly higher mean knowledge score than single p<0.002.There was significant association between Knowledge and practice p<0.001and also there was significant association between attitude and practice p<0.001.(35).

A study conducted in Malaysia showed that, having higher level of education was significantly associated with better knowledge of muscle pain *p*= 0.007 and use of the medicines against dengue *p*= 0.033, antipyretic drugs *p*= 0.011 and traditional medicines *p*= 0.042. Knowledge on dengue was significantly better among educated persons with respect to mosquito repellents p = 0.012, protective clothing p = 0.050, fogging (p = 0.001)(36). Another study in Malaysia showed that, significant association between practice and marital status *P*=0.003, significant association were recognized between Practices related to dengue fever prevention and gender *P*<0.010, knowledge on dengue fever *P*<0.001 and attitude towards dengue fever *P*<0.001. Knowledge on dengue fever were influenced by mass media *P*<0.001 and previous history of dengue fever *P*=0.019(37).Another study showed in Malaysia showed that, there was no significant association between knowledge and socio-economic status with *p*-value 0.16. Association between knowledge and living area localities were not affecting their knowledge status as the relationship between localities and knowledge status was not significant *p*=0.156(38). A Study done in Saudi Arabia showed that only the gender characteristic is predictor of practice against female mean=.1.7672 ± 0.25, male mean=1.6287±0.33. However, there is a highly significant difference between females and males in their practice P<0.005.Having heard about DF was the strongest predictor for having high knowledge score *p* < 0.001 (39).

3. CHAPTER III CONCEPTUAL FRAME WORK
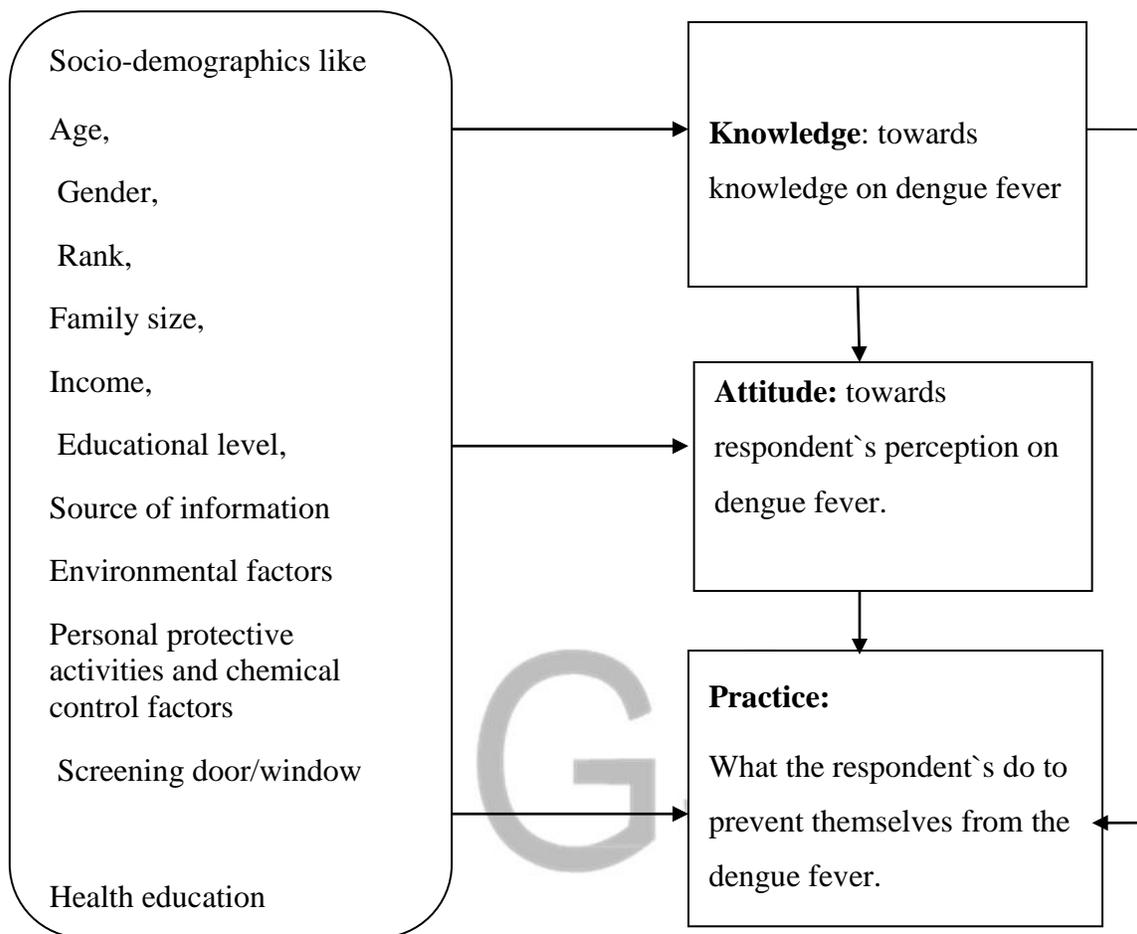
Figure 1: Diagrammatic presentation of conceptual frame work of the study

Justification of conceptual frame work

Source of information: In this study source of information means dengue information received by military personnel from health providers, mass media such as television, radio, news paper, printed materials like pamphlet, school activities.

Educational status: Low education status may affect accessibility to information.

Income: Individuals who have monthly net salary of Ethiopian birr.

Health education-may be affects the participants knowledge, attitude and practice.

4. CHAPTER IV OBJECTIVES

4.1. General objective

To assess the knowledge, attitude and practice and its associated factors towards dengue fever in Dire Dawa military camp.

4.2. Specific objectives

1. To assess the level of knowledge towards DF in military personnel.

2. To assess the level of attitudes toward dengue fever among military personnel.

3. To determine the practice of military personnel toward dengue fever prevention.

4. To identify the associated factors for preventive practice towards DF among military personnel.

12

5. CHAPTER V STUDY POPULATION AND METHODS

5.1. Study area

The study was conducted in Dire Dawa military camp in south Eastern command. Dire Dawa is found at a distance of 515 Kilometers from Addis Ababa to the Eastern part of the country. It is enclosed by the Somali and Oromia regional states. Dire Dawa is situated relatively lowland link *(*1200 m) above sea level and at a latitude and longitude of 9°36′N 41°52′E respectively. It has hot climate temperature and the average monthly temperature is 25°c ,while the average annual rainfall amounts to 604 mm(40).There are a total of six military residence camps in Dire Dawa. The study was conducted in military residence camps namely Sabian, Sebategna, miglas camp, Cuba camp, Dipo and Greek camps.

5.2 Duration of the study

The study was carried- out from February8 to March 9, 2018.

5.3. Study population

Source of population/target population

All military personnel age group (18-52) who live in Dire Dawa town

Study population

The study population was active military personnel, both male and female who live in six military camps.

Study participants:

Selected study participants those who were live in the six camps during the study period and who fulfill the inclusion criteria.

5.4. Study design

Cross-sectional study design was used.

Inclusion criteria

Those with the age 18-52 years.

Military live at least for 3 months.

Exclusion criteria

Civilian personnel working in the military camp.

Military personnel who are members of medical staff.

5.5. Variables

Dependent variables

Knowledge: (good knowledge, poor knowledge)

Attitude: (good attitude, poor attitude)

Practice: (good preventive practice, poor preventive practice).

Independent variables

There were multiple independent variables. These included socio demographic characteristic ,source of information, understanding of causes of dengue, symptoms, biting time , feeling on seriousness of dengue, personal protective activities, screen on windows/doors, breeding site (stagnant water, unwanted grass/tree, flower pot/plastics, discarded materials like old tires near to house, uncovered water in barrel and Jeri cans)and participation of health education,.

5.6. Operational definition

Military Ranks:

No ranks (PVT): An individual who has not given ranks especially new joined military forces.

Lower ranks: Ranks from corporal, Sergeant, staff sergeant, master sergeant and sergeant major.

14

Lower line officers: Military ranks from junior lieutenants to Capitan.

Higher officers**:** Are an individual's who has military rank from major to general.

Good Knowledge about Dengue fever**:** Refers to those study who scored point was greater than or equal to score ($\geq$50%) of knowledge questions about the dengue fevers.

Poor knowledge about Dengue fever: Refers to those study participants who scored point less than the score (<50%) of knowledge questions about the dengue fever.

Good attitude: Refers to those study participants who scored point greater than or equal to score ($\geq$50%) of attitude.

Poor attitude: Refers to those study participants who scored point less than attitude score (<50%) of response on the DF.

Good practice: The study participants who correctly respond to practice and their score value was greater than or equal to ($\geq$50%) of preventive practice knowledge questions about the dengue fevers.

Poor Practice: Refers to those study participants who respond to preventive practice questions and score value below <50%.

5.7. Data collection instruments and methods

The structured questionnaire was administered through face- to- face interview. The interviewers were train on how to use the questionnaires and conduct face- to- face interview. The questionnaire was prepared to cover aspects of knowledge, attitude, and practices and its associated factors toward the dengue fever was asked one-by-one sequentially to avoid bias.

The interviewers were not aware of correct answers to study questions in order to avoid interviewer bias during data collection. The investigators used the structured, pre-tested questionnaire both in Amharic and English and the English language is converted in to Amharic version, it was adopted from the published literatures. The questionnaire was consisted of four parts. The first part included questions regarding the socio-demographic characteristics data was assessed using 9 questions which covered general information of the respondents. The second part was measured knowledge part and using15 questions with multiple choices and`` yes``0' or ``no ``1 respond questions.. The third parts

15

attitudes was measure using 7statements, here the respondents was given the choice between strongly agreed, agree, neutral, disagree, and strong disagree. For each question item, 5-point likert scale ranging from strongly disagree (score 1), disagree (score 2), neutral/undecided (score 3), agree (score 4), to strongly agree (score 5). The practice related to prevention against dengue part questionnaires was included 18 question accounts multiple choice and``yes`1`or ``no``0 respond questions. The data collection was used the Amharic version of the questionnaire. In cases when a respondent was not found at home during the first visit, one more visit was under taken. One supervisor and four clinical nurses for data collection were employed.

5.8. Sampling size determination

The required sample size was determined using the formula for estimating sample size by using single population proportion with 95% confidence level (CI) and 0.05 degree of precision required. Since the prevalence of knowledge, attitude and practice and its associated factors towards for dengue fever is not studied either the national defense or other general population in Ethiopia, assumed a proportion of 50% of KAP was used. To inflate the sample, 10% was used to account for non-respondents and incomplete interviews. The following formula was used to estimate the minimum number of military personnel's required for the study.

Formula: $n = \dfrac{(z\alpha/_2)^2 \times p\,(1\text{-}p)}{d^2}$

Where:

   n=   minimum required sample size.

   z= Standard normal deviation (1.96) which is corresponding to 95% CI level.

   p= proportion 50%

   d =   desired degree of accuracy considered = 0.05 (marginal error 0.05)

   By using formula:

Sample size (n) = $(1.96)^2$ x 0.5(1-0.5)n= 384

$$(0.05)^2$$

Since the study site total populations are less than10, 000, I used to calculate the finite population correction factors formula:

$$nf = \frac{n}{1 + \frac{n}{N}}$$

$$nf = \frac{384}{1 + \frac{384}{880}} = 269$$

Where n=384 and N=880 and n=269

By adding non response rate was assumed 10 %

(269 x 10)÷100=27, Based on this formula, the final sample size for this study was 269+27=296 sample sizes.

5.9. Sampling technique

Systematic random sampling technique was used. Sampling frame was constructed based on the camp house list to select 296 households among the total of 880 households in the camps by using sampling interval, K=N/n. K=880/296≈3. Selection was done every $k^{th.}$ .Random selection was done to find the random starting point was selected using lottery method, then every 3 household after random starting point. Based on the interval made for each camp data collection was carried out.

5.10. Data Quality assurance

To assure the data quality high emphasis was given in designing data collection instrument. To ensure reliability, adequate orientation was given for data collector and discussion was done on questionnaires before collecting data and appropriate supervision was made. In order to make the study valid the questionnaire was developed from other similar studies and was modified to meet the need of the study population. Questionnaire

17

was prepared and customized to avoid entry of illegal values and skip patterns. Each questionnaire was given an identification number. Data collection was checked daily both by the supervisor and the principal investigator for clarity of filling of questionnaire. The respective supervisor was also checked the completeness of the questionnaire before interviewing for respondent by data collectors. The principal investigator   also checked the completeness of the questionnaires after it is returned back from the data collectors. 5% was pre- tested on the similar population of Police force camp house hold level in Dire Dawa, Kezira kebele o3 during Febraury5 to 7,2018.

Internal validity in this study was ensured by the fact that the questionnaire, translate in to Amharic and pre-test by non-participants in this study.

External validity was ensured by, the fact that the study context is specific to the culture and environment of the militaries defense force institution. Also in this study, reliability was assured by using a tool (questionnaires) test for reliability in the pre-test study. The sample size was adequate in order to ensure external validity. Probability sampling was used to make the sample representative of the study population. Effort was done to ensure high response rate from the study participants.

5.11. Data processing and analysis

Data were coded and enter in to Epi. Data3.1version. Then it crosses checked for accuracy, consistency, clearing and exported to SPSS version 20 for statistical analysis. After data entering the data was cleaned and managed including data category for the selected variable. Descriptive statistics such as frequencies, percentages, measurement of central tendency, standard deviation, proportional was employed to describe socio-demographic and KAP towards associated factors of DF variables. The degree of association between independent factors and preventive practice was measured first by using bivariate analysis on logistic regression to identify factors, then variables that have p-value <0.25 in bivariate analysis was inserted into multivariable logistic regression analysis. Odds ratios (OR) and 95% confidence interval was used to measure the strength of associations and significance between outcome variables and certain independent

variables. The independent effect of factors on preventive practice of dengue fever was investigated using multivariable logistic regression analysis. The level of significance was a cut of point of p-value<0.05.

5.12. Ethical consideration

Ethical clearance was obtained from Institutional review Board (IRB) of DUCHS. The Permission of study was obtained from the relevant personnel in charge of the health main directorate of ministry of defense and East command health directorate. All information was secured to maintain confidentiality and there was not be any leakage of information. Before data collection the participant was sign written consent. In the consent the objective use and benefit of the study was described. Moreover, information given to the respondent was kept confidential; he/she can withdraw from the study at any time; no harm was occurring as result of participating in the study. In addition the person participates in the study voluntarily without any pressure.

5.13. Dissemination of the result

The study result will be communicated to the study participants and health office of the study camps. Findings of the study will be disseminated through submission of the report to Defense University College, Department of public health, Defense Health Main Directorate and Easter command health directorate. Besides, presentation of the results of the study was carried out on research workshops.

6. CHAPTER VI   RESULTS

6.1 Socio-Demographic Characteristics of the Study Population

A total of 296 respondents were interviewed and the response rate was 100%. Among a total of 296 participated in the study, vast majorty260 (87.8%) were males and 36(12.2%) females. The mean age ± SD of the study participants was (35.6 ± 8.85). Majority 119(40.2%) of the respondents were aged between29-40years.

Regarding educational level majority 1-10th grade were 164(55.4%), followed by those who had diploma were71 (24.0%). Regarding to military rank, majority of military rank were lower rank 104(35.1%) followed by lower line officer 88(29.7%), higher officer 59(19.9%). 45 (15.2%) had no rank (PVT),

Majority of participants were orthodox189 (63.9%) followed by protestant 65(22.0%).Regarding to ethnicity majority were Oromo 102(34.5%) ,regarding to marital statute, majority 221(74.1%) of study participants were married.

Earned monthly income of participants blow 2000 birr were 46(15.5%) and monthly income between2001-3000 were 62(20.9%), majority   124(41.9%) were   income between 3001- 4000 . Regarding to family size majority of family size of military personnel found between1-3 were 173(58.4%) (Table1).

Table1: Socio-demographic characteristics of military personnel in Dire Dawa military camps, February 2018. (n=296).

Characteristics	Frequency	%
Gender		
Male	260	87.8
Female	36	12.2
Age group		
18-28 years	80	27.0
29-40 years	119	40.2
41-52 years	97	32.8
Educational status		
1- 10th grade	164	55.4
Preparatory	29	9.8
Diploma	71	24.0
Degree and above	32	10.8
Military rank		
No rank	45	15.2
Lower rank	104	35.1
Lower officer	88	29.7
Higher officer	59	19.9
Religion		
Orthodox	189	93.9
Muslim	40	13.5
Protestant	65	22.0
Other	2	0.7
Ethnicity		
Oromo	102	34.5
Amhara	63	21.3
Tigre	62	20.9
Others	69	23.3
Monthly income		
<2000	46	15.5
2001-3000	62	20.9
3001-4000	124	41.9
4001-5000	42	14.2
>5000	22	7.4
Marital status		
Married	221	74.7
Single	71	24.0
Divorced	2	0.7
Separated	2	0.7
Family size		
1-3	173	58.4
4-6	106	35.8
more than 6	17	5.8

Other*SNNPS, Gambela, Harari, Somali

21

6.2. Knowledge towards DF

Regarding to the study participant`s exposure to dengue, all study participants 296(100%) heard about dengue fever. The main source of information was health professions 180(60.9%) followed by information heard through TV/radio 44 (14.9 %) (Figure2).
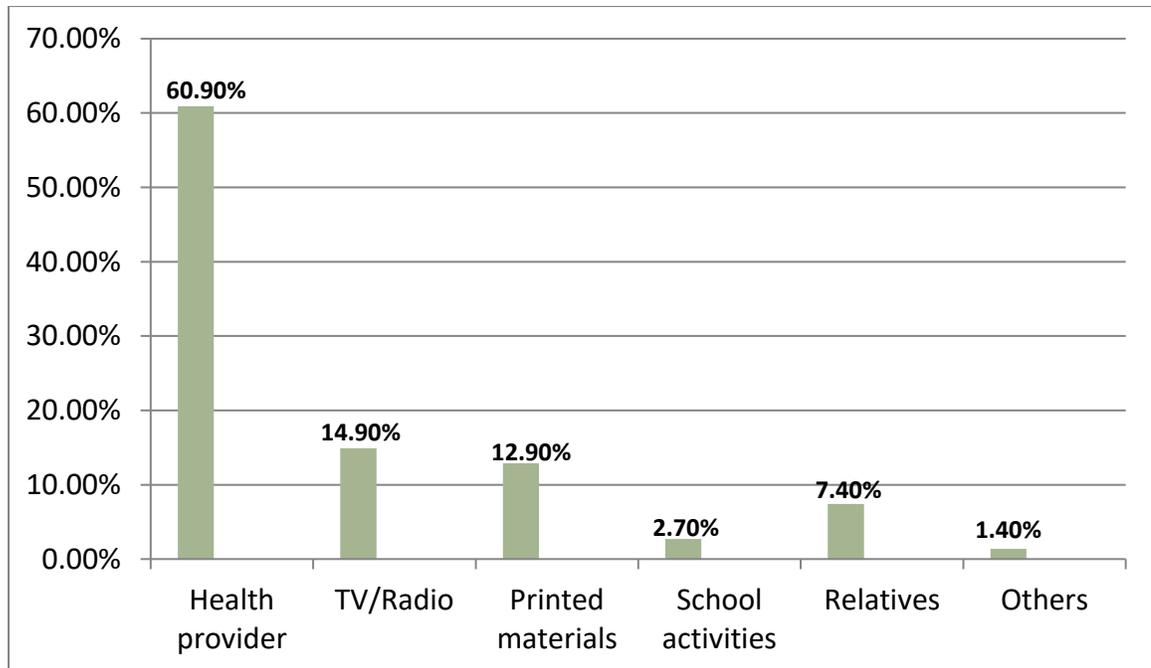
Figure 2: Source of information regarding DF among military personnel in Dire Dawa

Regrinding to knowledge of participants, majority of the participants answered.They don`t know what the cause of dengue were 152(514%), those who correctly answered that DF caused by virus were 77(26.0%). Vast majority of participants responded that, dengue is transmissible disease 284(95.9%). Two hundred thirty five (79.4%) of the participant knew that dengue is transmitted through infected mosquitoes bite, very few 9(3.0%) answered that dengue was caused by blood transfusion.

In order to distinguish dengue from other febrile illnesses regarding to the symptoms of dengue, majority of respondent knew that high fever was the most common symptom

22

of dengue 276(93.2%) ,mentioned by the participants followed by headache 254(85.8%).

Respondents knew that the type of mosquito that transmit dengue fever, very low percent of respondent mentioned that Aedes mosquitoes as the main disease vector 36(12.2) ,high number of participants answered that don`t know the types of mosquito were 198(66.9%), and anopheles mosquito transmitted dengue were57(19.3%).Participants knew about usually mosquito biting time, especially day time when sun rise and sun set biting behavior of the mosquito was correctly answered by 80 (27.0%) participants while majority 179(60.5%) of respondents answered that the mosquito can bite during night time only.

Mosquito usually breeding site was uncovered pound answered that majority 219(74.9%) of participants followed by 192(64.9%) mosquito breeding site in the flower pot/plastic container, in the garbage 131(44.3%),discarded old tire134(45.3%),trash cans were 123(41.6%),in the open drainage which is near to resident were 142(48.0%), almost half of respondent answered that clean water found in uncovered barrel and Jerri cans were most breeding site of mesquites 150(50.7%).The study participants knew that the responsible for dengue mosquito control and prevention, majority of participant answered that both government and every one had responsibility for dengue control and prevention211 (71.3%), everyone only were76 (25.7%).

Over all knowledge status among respondent knowledge level was determined by comparing one's knowledge score against the mean knowledge score. Regarding to this overall good knowledge 158(53.4%) and overall poor knowledge status was138 (46.6%) (Table2).

23

Table 2: knowledge of dengue fever among military personnel's of Dire Dawa military camps February 2018 (n= 296)

Variables	Frequency	%
Heard about DF		
Yes	296	100
No	0	0
knew the symptom of DF		
Yes	295	99.7
No	01	0.3
DF is transmit trough		
infected Aedes mosquito bite	235	79.4
blood transfusion	9	3.0
I do not know	52	17.6
Mosquito usually biting time		
at day time	80	27.0
at night time	179	60.5
I do not know	37	12.5
DF affects all age groups		
Yes	243	82.1
No	53	17.9
Mosquito that transmitting DF		
Aedes aegypti	36	12.2
Anopheles mosquito	57	19.3
I do not know	203	68.5
Cause of DF		
Virus	77	26.0
Bacteria	52	17.6
Protozoa	12	4.1
I do not know	155	52.3
Knew mosquito breeding site in the flower pots		
Yes	192	64.9
No	104	35.1
Breed in the uncovered found		
Yes	219	74.0
No	77	26.0
Drainage near to home is breeding site of mosquito		
Yes	142	48.0
No	154	52.0
Participation of health education		
yes	206	69.6
no	90	30.4
Over all knowledge		
Good	158	53.4
Poor	138	46.6

24

6.3 Attitudes towards dengue fever

Majority of participants' 228(77.0%) were agreed that dengue fever was a serious public health problems; dengue could be preventable agreed were 245(82.2%). About194 (65.5%) of participants agreed that they might be at risk of getting dengue. Also about193 (65.2%) of participants agreed that insecticide helps in reducing mosquito breeding, about 203(68.6%) participants were agreed on most effective method of controlling and preventing dengue infection is used to eliminate the breeding place of the vector mosquitoes. Two hundred twenty nine (77.4%) of participants were agreed that the individuals had an important role in dengue fever prevention and the reaming 67(22.6%) of participants were disagreed that the individuals had an important role in dengue fever prevention. The overall attitude status of participants good attitude 188 (63.5%) and poor attitude were 108(36.5%) (Table3).

Tables 3: Attitude level towards agrees and disagree of DF amongst military personals of Dire Dawa camps: February 2018 (n= 296)

Attitude statement	Agree n (%)	Disagreed (%)
Dengue is a serious public health problems	228(77.0)	68(23.0)
Dengue fever could be preventable.	245(82.8)	51(17.2)
Everybody has risk of being getting DF	194(65.5)	102(34.5)
Insecticide helps in reducing mosquito breeding	193(65.2)	103(34.8)
Most effective method of preventing dengue infection is to eliminate the breeding place of the vector	203(68.6)	93(31.4)
Strong and healthy person will not get dengue infection	36(12.2)	260(87.8)
You have an important role in dengue fever prevention	229(77.4)	67(22.6)

25

6.4 Practices towards DF

Majority of the respondents answered that they were performing poor practices of DF prevention 167(56.4%). Those participants who were not covering water containers in the home 132(44.6%) and covering water were 164(55.4). The study participants that were not keeping the surroundings clean 187(63.2%), and those who not used insecticide sprays were 237(80.1%).

Majority of participants were having mosquito bed net 264(89.2%), among them 187(63.2%) were used mosquito bed nets during sleep at night time only, only 65(22.0%) were used at day and night time, 13(4.4%) of participants were used at day time while sleeping and taking nape.

Having flower plants around home were 212(71.6%), having water holding container like barrel and Jerri can with water in the home or around home were 188(63.5%).

About 74(25.0%) respondents had open drainage around their home .One hundred thirty two (44.6%) of participants were not using window/door screens to keep mosquitoes out of the house, about 237(80.1%) of participant`s house were not sprayed by insecticidal. Majority of participants were usually stayed around home and under the shadow at day time which is exposed to mosquito bite were 265(89.5%) and those who were wears short T-shirt 280(94.6%).Majority206 (69.6%) of participant were participated by health education on the topics of dengue fever last 6 month. Regarding to overall practice of participant, good practice accounts 129(43.6%) and poor practice of participants was167 (56.4%) (Table4).

Table 4: Practice on dengue fever among military personals of Dire Dawa military camps February 2018 (n= 296)

| Variable	Frequency	%
Covering storage water container		
yes	164	55.4
no	132	44.6
Avoiding stagnant/drainage water		
yes	162	54.7
no	134	45.3
Using mosquito bed nets		
At day time when sleep/take rest	13	4.4
At night time	187	63.1
At day and night time	65	22.0
Not use at day time	31	10.5
Usually wear cloth at day time		
Short T-shirt	280	94.6
Long T-shirt	16	5.4
Having flowering plant near to house		
yes	212	71.6
no	84	28.4
Participating environmental sanitation		
Yes	109	36.8
no	187	63.2
Seat outside the door at day time		
yes	265	89.5
no	31	10.5
Use fan/ventilator at day time		
yes	66	22.3
no	230	77.7
Using window/door screen		
yes	164	55.4
no	132	44.6
Used insecticide spraying		
yes	59	19.9
no	237	80.1
Overall practice		
Good practice	129	43.6
poor practice	167	56.4
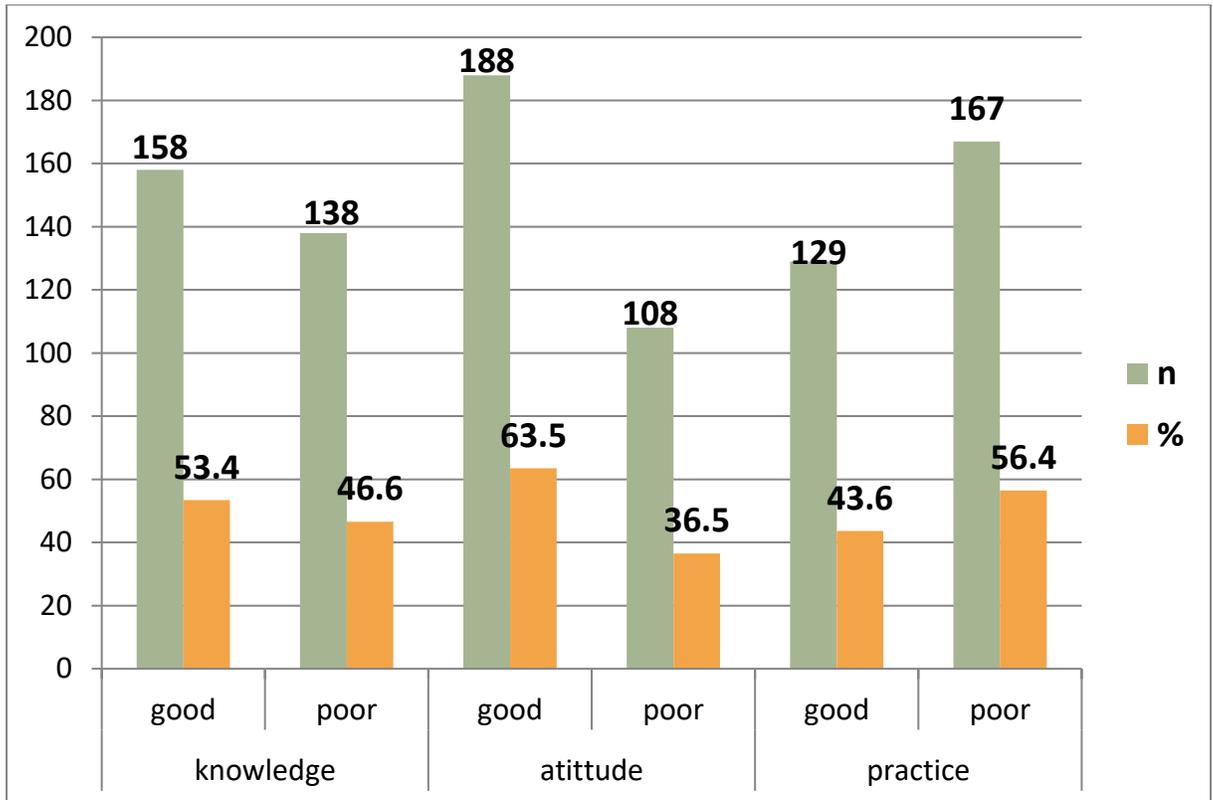
Figure 3: Overall level of KAP towards DF among army personnel

6.5: Associated factors

6.5.1. Factors associated with knowledge towards DF

Bivariate and multivariate regression analysis was done to assess the association between Independent variables and the outcome variable. Accordingly, in bi-variate logistic regression analyses factors which is significantly associated with knowledge of participants were age (p<0.001), income (p=0.002) and attitude (p<0.001) were significantly association with knowledge in the study (p< 0.05).

However, other variables which were not statistically significant in bivariate and candidates for multivariable logistic regression analysis were rank (p=0.005), religion (p=0.218) were at (p < 0.25) were not statistically significant associated with knowledge with 95% CI.

After adjusting odds ratio in the multivariable logistic regression analysis at (p < 0.05), factors like age group18-28(p=0.001), age group 29-40(p=0.004) and overall attitude (p=0.001) were significantly associated with participant`s knowledge of dengue fever.

Based on the above finding, participants age group 18-28 were found to be significantly associated 2 times more likely to have poor knowledge towards dengue when compared to the ones having age group 41-52 years [AOR (95%CI)= 2.912(1.519-5.581)], age group 29-40 were also 2 times more likely to have poor knowledge towards dengue fever when compared the ones having age group 41-52 years [AOR(95%CI)=2.396(1.327-4.329)] was found to have significant association with knowledge of dengue fever and participant`s poor attitude was 2 times more likely to have poor knowledge towards dengue when compared to the ones having reference of good attitude [AOR (95%CI) =2.485(1.462-4.223)] (Table.5).

Table 5: Bi-variable and multi vitiate logistic regression analysis of socio demographic factors, attitude and preventive practice associated with knowledge on Dengue fever in Dire Dawa military camp (n=296)2018.

Variables	Knowledge		COR(95%CI)	AOR(95%CI)	p-value
	Poor Knowledge	Good knowledge			
Age					
18-28	46(57.5)	34(42.5)	3.172(1.705-5.902)	2.912(1.519-5.581)	0.001*
29-40	63(52.9)	56(47.1)	2.638(1.500-4.638)	2.396(1.327-4.329)	0.004*
41-52	29(29.9)	68(70.1)	1.00	1.00	
Rank					
No rank	27(60.0)	18(40.0)	3.706(1.631-8.418)	0.494(0.093-2.624)	0.408
Lower rank	56(53.8)	48(46.2)	2.882(1.456-5.705)	0.528(0.135-2.072)	0.360
Lower officer	38(43.2)	50(56.8)	1.878(0.929-3.796)	0.453(0.126-1.624)	0.224
Higher officer	17(28.8)	42(71.2)	1.00	1.00	
Ethnicity					
Oromo	45(44.1)	57(55.9)	1.00	1.00	
Amhara	35(55.6)	28(44.1)	1.583(0.841-2.980)	1.561(0.764-3.187)	0.222
Tigre	24(38.7)	38(61.3)	0.800(0.420-1.522)	1.009(0.484-2.100)	0.982
Others	34(49.3)	35(50.7)	1.230(0.667-2.271)	1.243(0.614-2.516)	0.545
Religion					
Orthodox	85(45.0)	104(55.0)	1.00	1.00	
Muslim	18(45.0)	22(55.0)	1.001(0.504-1.987)	0.900(0.426-1.904)	0.784
Protestant	35(58.0)	30(46.2)	1.427(0.811-2.513)	1.253(0.656-2.393)	0.495
Other	NR	2(0.7)	0.000(0.00,NR	0.000(0.000- NR)	0.999
Income					
Blow2000 birr	30(65.2)	16(34,8)	6.375(1.984-20.483)	3.411(0.826-14.088	0.090
2001-3000birr	32(51.6)	30(48.4)	3.627(1.190-11.055)	1.427(0.389-5.228)	0.592
3001-4000	59(47.6)	65(52.4)	3.086(1.072-8.886)	1.582(0.486-5.150)	0.446
400-5000 birr	12(28.6)	30(71.4)	1.360(0.409-4.520)	1.037(0.293-3.678)	0.955
Above 5000	5(22.7)	17(77.3)	1.00	1.00	
Attitude					
Poor	70(64.8)	38(35.2)	3.251(1.983-5.330)	2.485(1.462-4.223)	0.001*
Good	68(36.2)	120(63.8)	1.00	1.00	
Health education					
Yes	88(42.7)	118(57.3)	1.00	1.00	
No	50(55.6)	40(44.4)	0.597(0.362-0.983)	1.345(0.701-2.580)	0.372

* Multivariable logistic regression statically significant at p value <0.05

6.5.2. Factors associated with attitude towards DF

In bi-variate logistic regression analyses factors which is significantly associated with attitude of participants were health education (p<0.001), knowledge (p<0.001) and practice (p<0.001) were significantly association with participant`s attitude in the study (p< 0.05).

However, other variables which were not statistically significant in bivariate and candidates for multivariable logistic regression analysis were gender (p=0.131), age (p=0.090), rank (p=0.038), income (p=0.036) at significance level of (p < 0.25) were not statistically significant associated with attitude with 95% CI.

After adjusting odds ratio in the multivariable logistic regression analysis at (p < 0.05), factors like health education (p<0.001), knowledge (p<0.001) and preventive practice (p<0.019) were significantly associated with participant`s attitude.

Based on the above finding, participant`s health education found to be significantly associated 3 times more likely to have over all poor attitude towards dengue when compared to those respondents who were participated in health education [AOR (95% CI) =3.312(1.776- 6.177)], participant`s poor knowledge were 66% [AOR (95% C.I) =0.340(0.193-0.599)] less likely to having overall poor attitude towards dengue compared to good knowledgeable groups, and participants poor practice was 2 times more likely to be poor attitude when compared to reference groups [AOR (95% C.I) =2.139(1.132-4.043)].There was no association between attitude and socio demographic characteristics in multivariable logistic analysis (Table.6).

Table 6:.Bi-variable and multivariate logistic regression analysis of socio demographic factors, knowledge and practice associated with attitude on Dengue fever in Dire Dawa military camp(n=296)2018

Variables	Attitude		COR (95%CI)	AOR (95%CI)	p-value
	Poor Attitude	**Good attitude**			
Gender					
Male	99(38.1)	161(61.9)	1.845(0.833-4.084)	2.234(0.907-5.506)	0.081
Female	9(25.0)	27(75.0)	1.00	1.00	
Age cat					
18-28years	31(38.8)	49(61.2)	1.640(0.872-3.086)	1.429(0.438-4.667)	0.554
29-40 years	50(42.0)	69(58.0)	1.879(1.058-3.336)	1.227(0.562-2.679)	0.608
41-52 years	27(27.8)	70(72.2)	1.00	1.00	
Rank					
No rank	16(35.6)	29(64.4)	1.952(0.820-4.640)	3.106(0.604-15.984)	0.175
Lower rank	47(45.2)	57(54.8)	2.918(1.411-6.035)	3.122(0.755-12.904)	0.116
Lower officer	32(36.4)	56(63.6)	2.022(0.952-4.295)	1.843(0.469-7.248)	0.381
Higher officer	13(22.0)	46(78.0)	1.00	1.00	-
Income					
Below 2000	14(30.4)	32(69.6)	1.487(0.458-4.833)	0.691(0.179-2.667)	0.592
2001-3000	31(50.0)	31(50.0)	3.400(1.115-10.363)	2.365(0.666-8.396)	0.183
3001-4000	48(38.7)	76(61.3)	2.147(0.744-6.202)	1.697(0.513-5.618)	0.386
4001-5000	10(23.8)	32(76.2)	1.062(0.312-3.614)	0.894(0.227-3.524)	0.873
Above 5000	5(22.7)	17(77.3)	1.00	1.00	
Family size					
1-3	66(38.2)	107(61.8)	2.005(0.627-6.407)	1.448(0.351-5.967)	0.608
4-6	38(35.8)	68(64.2)	1.816(0.553-5.963)	1.614(0.396-6.573)	0.504
Above 6	4(23.5)	13(76.5)	1.00	1.00	
Health educ					
Yes	52(25.2)	154(74.8)	1.00	1.00	
No	56(62.2)	34(37.8)	0.205(0.121(0.348)	3.312(1.776-6.177)	<0.001*
Knowledge					
Good	38(24.1)	120(75.9)	0,308(0.188-0.504)	0.340(0.193-0.599)	<0.001*
Poor	70(50.7)	68(49.3)	1.00	1.00	
Practice					
Good	25(19.4)	104(80.6)	1.00	1.00	
Poor	83(49.7)	84(50.3)	4.110(2.416-6.995)	2.139(1.132-4.043)	0.019*

* Multivariable logistic regression statically significant at p value <0.05

6.5.3. Factors associated with preventive practice towards DF

In bi-variate logistic regression analyses factors which is significantly associated with practice of participants were income (p=0.026), health education (p<0.001), knowledge (p<0.001) and attitude (p<0.001) were significantly association with participant`s practice in the study (p< 0.05).

This study found that, there were no other variables which were not statistically significant in bivariate and candidates for multivariable logistic regression analysis at significance level of (p < 0.25).

After adjusting odds ratio in the multivariable logistic regression analysis at (p < 0.05), factors like income blow 2000 birr (p=0.009), income between 2001-3000 (p=0.028), income 3001-4000(p=0.047), income earn 4001-5000 (p=0.006), health education (p<0.001), knowledge (p<0.004) and attitude (p<0.012) were significantly associated with participant`s preventive practice of dengue fever.

Based on the above finding, participant`s monthly income below 2000 found to be significantly associated 6 times more likely to having poor preventive practice towards dengue when compared to having the monthly income above 5000 birr [AOR (95% C.I)=6.754 (1.624-28.096)], monthly income between 2001-3000 were 4 times more likely to have poor preventive practice towards dengue when compared to ones monthly income above 5000 birr [AOR (95% C.I)=4.603(1.179-17.972)] ,monthly income 3001-4000 were 3 times more likely to have poor preventive practice towards dengue when compared to the reference income groups [AOR(95% C.I)=3.683(1.016-13.351)] and monthly income earn 4001-5000 were 7 times more likely to have poor practice towards dengue when compared to ones monthly income above 5000 birr [AOR(95%C.I)=7.092(1.735-28.982)] were significantly associated with participant`s preventive practice on dengue fever.

Individuals who were participated in health education were significantly associated with overall preventive practice. Regarding to this, those respondents who were not participated in health education were 13 times more likely to have poor perform

33

preventive practice towards dengue when compared to respondents who were participated in health education. [AOR (95% CI) =13.970(5.989-32.585)] .This study also found that, the knowledge of participant was significant association with preventive practice, in this regard, study participants with overall poor knowledge were 57% [AOR (95% C.I)= 0.426(0.240-0.758)] less likely to have overall poor preventive practice towards dengue prevention as compared to those who having overall good knowledge. Also participant`s attitude was significant association with preventive practice ,regarding to this the overall poor attitude of DF were about 2 times more likely to have poor preventive practice when compared to the one's having good attitude towards dengue [AOR (95% C.I) =2.249 (1.198-4.224)].The remaining of socio- demographic characteristics like gender, educational level, Ethnicity, religion, marital status and family size were found to have no association with preventive practice (Table.7).

34

Table-7: Bi-variable and multivariate logistic regression analysis of socio- demographic factors, knowledge and attitude associated with preventive practice among study participants in Dire Dawa military camps (n=296)2018.

Variables	Practice		COR (95%CI)	AOR(95%CI)	p-value
	Poor practice	Good practice			
Age					
18-28	50(62.5)	30(37.5)	1.633(0.894-2.983)	0.706(0.237-2.101	0.532
29-40	68(57.1)	51(42.9)	1.306(0.762-2.238)	0.824(0.370-1.834)	0.636
41-52	49(50.5)	48(49.5)	1.00	1.00	
Rank					
No rank	30(66.7)	15(33.3)	2.720(1.214-6.094)	3.413(0.711-16.391)	0.125
Lower rank	62(59.6)	42(40.4)	2.008(1.050-3.838)	3.541(0.904-13.871)	0.070
Lower officer	50(56.8)	38(43.2)	1.789(0.919-3.486)	2.597(0.723-9.321)	0.143
Higher officer	25(42.4)	34(57.6)	1.00	1.00	
Income					
Blow2000 birr	31(67.4)	15(32.6)	5.511(1.793-16.936)	6.754(1.624-28.096)	0.009*
2001-3000birr	40(64.5)	22(32.5)	4.848(1.658-14.175)	4.603(1.179-17.972)	0.028*
3001-4000	66(53.2)	58(46.8)	3.034(1.114-8.268)	3.683(1.016∙13.351	0.047*
400-5000 birr	24(57.1)	18(42.9)	3.556(1.160-10.894)	7.092(1.735-28.982)	0.006*
Above 5000	6(27.3)	16(72.7)	1.00	1.00	
Health educ					
Yes	85(41.3)	121(58.7)	1.00	1.00	
No	82(91.1)	8(8.9)	0.069(0.032-0.149)	13.970(5.989-32.585)	<0.001*
Knowledge					
Poor	96(69.6)	42(30.4)	2.801(1.734-4.523)	0.426(0.240-0.758)	0.004*
Good	71(44.9)	87(55.1)	1.00	1.00	
Attitude					
Poor	83(76.9)	25(23.1)	4.110(2.416-6.995)	2.249(1.198-4.224)	0.012*
Good	84(44.7)	104(55.3)	1.00	1.00	

* Multivariable logistic regression statically significant at p value <0.05

7. CHAPTER VII DISCUSSION

This study had focused on military personnel's. The aims of this study at assessing KAP towards dengue fever among military personnel's in Dire Dawa camps. Out of 296 military personnel's participate in the study 53.4% were overall good knowledge, 63.5% were overall good attitude and 56.4%were poor preventive practice towards dengue. Participant`s Poor practice was significantly associated with knowledge, attitude, income and health education. No similar studies evaluating the level of KAP towards dengue among military personnel or others in Ethiopia exist so far and there is a limited literature about assessing KAP among military personnel`s since there is no study done in army.

7.1Discussion on Knowledge towards dengue fever

Regarding to source of information about dengue, the main source of information was health personnel 60.9%, followed by TV/radio14.9%, relative, family, friend and neighbors 12.8%,from schools 2.7% ,this finding was lower in certain source of information when compared to the study done in Malaysia, health person 3.3%,TV/radio 32.8%, newspaper5.5%,school 4.9%,negabours/friends1.6% [(18), (23),(36),(39)]. The reason for this difference was the setting of the study participants varies greatly regarding to their mission and access situation.

This study revealed that about 46.6%, 95%CI (40.9-52.2) of the respondents were having poor knowledge level and also 53.4%, 95% CI (47.8-59.1) of participants had good knowledge of dengue. Similarly a   cross-sectional study carried out in Philippines showed that, 56.3% of the participants had good knowledge and 43.8% had poor knowledge on dengue (17). The result of this study was better than the study done in Abidjan, Cote dIvoire showed that 21% health professionals had good know-ledge score and 79% of participants were high on poor knowledge(28) The reason for this difference may be that there have been good awareness on dengue infection .

 Another similar study conducted in Malaysia ,48.0% were having good knowledge and 52.0% of respondents were poor knowledge   towards DF (26),.

This study found   that,100% of the respondents heard about dengue fever and all participants were literate, this study was better than the previous study conducted in India showed that, about 4% of study participants have never heard about dengue of whom 25% were illiterates (23). The possible difference was due educated population variation and in our country context new joining defense force were educated before Joining to defense force.

 In regards of knowledge items, the majority of the respondents know that a person with dengue may develop typical symptoms like fever as the chief presenting symptom of dengue   93.2%,95%   CI(90.2-95.9)   ,headache   85.8%,   95%   CI(82.1-90.1),skinrash23.3%,joint   pain56.4%,muscle   pain37.2%,nausea   and   vomiting 27.7%,shivering 25.3%, nasal bleeding 26.4%,pain behind the eyes40.2% with 95%CI(34.3-45.6), this study was slightly low in some symptoms compared to the previous studies done in Malaysia showed that, fever for 3-5 days 95.1%, headache 92.3%, joint pain 91.8%, muscle pain 72.7%, and rashes 75.4% (18).This figure was slightly lower when compared with a study conducted in Malaysia, in 2017, F. M. Yussof et al. showed that, fever 98.4%, shivering 80.2%, nausea and vomiting 82.1%, headaches 80.9%, joint pain 83.7%, muscle ache 68.6%, pain behind the eyes 44.7%, back pain 44.9%, nasal bleeding 59.5%, skin rashes 60.9% and (21). A possible reason for this certain low level of knowledge on clinical symptoms of DF may be that there has been no regular awareness program on this infection and that the disease itself only recently emerged in the country.

This study indicate that, large proportion believed that paracetamol 69.9% , 95%CI(64.5-75.2) was   a medicines against dengue to reduce fever, but the finding was slightly lower when compared with the study conducted in Malysia77% believed that antipyretics against dengue(18). This study was also revealed that, participants knew the correct answer of the cause of dengue virus 26.0% and very few participants answered that dengue transmitted by Aedes mosquito12.2%. Regarding the biting time of Aedes mosquito, most of usually bites time was at day time especially sun rise and sun set

37

27.0% and at night time 60.5%,this result is slightly lower when compared to the study conducted in Malaysia showed that, majority of the military cadets were knew that dengue is caused by a virus 85.5% and transmitted by Aedes mosquito bite 97.8%, most of them knew that the mosquito usually bites either at sunset 92.3% or at sunrise 68.9%(18). The possible reasons for low awareness could be, there is weak of repeated exposure to health education messages on dengue.

This study was also revealed that the respondent`s knew about mosquito usually breeding cite in the clean water were50.7%, uncovered pound 74.0% in the flower plants 64.9%, stagnate water 48.0%, in the garbage 44.3%, in the discarded old tire45.3%, this figure was lower when compared with the study conducted in Malaysia showed that clean water is the most suitable breeding place for Aedes mosquitoes. The most important breeding places for the mosquito were reported as uncovered water container 96.8%, flower pot 96.4%, abandon tire 96.1% and uncovered pond 81.6% (21). This finding were slightly better than the finding present in study done in Kenya showed that, 76% were from large containers: jerry cans, 18%, drums, 17%, buckets, 16%, tires, 14% and large water tanks, 10%.Although, jerry cans were the most productive containers of mosquito overall (4).The reason for this may be that there have been better awareness on dengue preventive method.

Regarding to the responsibility for vector control and prevention, this study finding that, the government and everybody has responsibility to prevent and control dengue were 71.3%, But the result was better than the study conducted in India showed that, 49% of the participants expressed that it must be a mutual responsibility between Government and individual.(23). Possible reasons for better awareness could be felt of re- emerging of dengue fever and the seriousness of disease among army personnel.

According to multivariable analysis, this result also revealed that overall knowledge was significant association with age groups 18-28 and they were having poor knowledge of dengue compared to those age group 41-52 years. This finding was consistent with the study done in Malaysia in 2017, revealed that the knowledge score was statistically

38

significant higher in age group 40-49 and the age group of 50-59 as compared to the age group of 20-29. [(27),(16)].The reason may be due to more experience, and more exposure on dengue in the workplace.

This study was also found that participants' overall good knowledge 53.4% 95%CI(47.8-59.1)of dengue was found to be significantly associated with overall attitude, this figure is lower when compared with a study from Malaysian showed that, 93% of respondents with good knowledge status also having good attitude towards dengue prevention and statistically it was significant(26). The reason for this significance difference was lower awareness and perception among army regarding dengue. .

7.2 Discussion on Attitude towards dengue fever

This study was found that 63.5% of overall good attitude 95% CI (58.1-69.3) and 36.5% of poor attitude 95% CI (30.7-41.9) towards dengue. In this study, the level of overall good attitude about dengue was lower than the previous studies carried out in Malaysia, 90.5% were overall good attitude and 9.5% were poor attitude was lower than this study (26) , the difference of my be the individual`s perception with in army personnel and interaction . Also this study findings was lower than the study conducted in Abidjan, Cote dIvoire74% were good attitude and 26%were poor atittude(28). This difference may be due to social interaction between the military personnel`s and the majority of army had lower perception about a risk of dengue fever.

This study revealed that dengue is serious public health problem were agreed 77.0% ,95%CI(71.7-80.7) this study was similar that the study done in India showed that, 81% of study population considered dengue as a serious public health problems(23).Also this study was lower when compared to the study conducted in Malaysia military cadet indicate that ,the majority of the respondents perceived that dengue is one of the most serious public health problems (97.3%),the reasons maybe low perception on the seriousness of dengue. This study also indicated that the dengue fever could be preventable were agreed 82.8% ,95%CI(78.2-86.8) ,but it this founding was slightly lower when compared with another study done in Malaysia showed that, there is a need

39

for preventive actions 91.8% (18).The reason on this difference may be low social interaction with in military personnel regarding to dengue prevention.

This found revealed that ,the best methods to avoid mosquito breeding was environmental sanitation ,which is interrupt the transmissions and breeding site of mosquito were agreed 68.6% ,95% CI (62.8-74.2) ,chemical spry reduce mosquito breeding agreed 65.2% with 95% CI(58.9-70.3) ,this figure is, in fact lower when compared with the figure reported in India , 94% study participants opined that environmental modification to prevents dengue and 80% of participants were feel spraying insecticidal agents at mosquito breeding sites control dengue(23)The difference may low feeling and low interaction among army personnel . Another study in Malaysia showed that,83.3% agreed that everybody has a chance to be contracted with dengue virus, this is higher than this study found 65.5% , 95%CI(59.8-70.7) (21). The possible difference was low awareness of dengue prevention among army personnel.

This study was also found that, males were 2 times more likely to have poor attitude than female. This finding was similar with the study done in Nepal (41). The reasons may be due to most of females was better perception with handling of the house cleaning and more interactions with neighbors.

The result also showed that, overall attitude was significant association with overall knowledge. Similar study conducted in Malaysia, showed that good knowledge status also have significance associated with good attitude towards dengue prevention (26). This is likely due to the better educational level of the study participants.

Overall good attitude 63.5% ,95% CI(58.1-69.3) was statically significant association with over all preventive practice this is significance difference that the study conducted in Malaysia, in 2017, showed that 55% of the respondents with good attitude also have good practice status towards dengue prevention (26) the significance difference due to better perception on dengue.

40

7.3 Discussion on Practice towards dengue fever

This study found an overall poor preventive practice 56.4% , 95% CI(50.7-62.5) and overall good preventive practice were performed 43.6% with95%CI(37.5-49.3) towards dengue The level of this study on practice about dengue prevention slightly low when compared to the findings in previous studies carried out in Malaysia showed that, over all poor practice 46.0% and good practice was 54.0% was also high compared to this study(26) this difference may be due poor preventive actions with in army personnel. But it is better than the previous study done in Abidjan, Cote dIvoire, showed that the overall poor preventive practice were 79% was higher than this study, and good practice were   21% of this study was higher(28). The possible reason for difference might be due to as result of difference in study population and various preventive methods between the countries on dengue prevention.

In regards of practice items, the majority of the respondents eliminated drainage water near to house 54.7%, with 95% CI (49.1-60.1), covering water container 55.4% with 95%CI(49.5-60.8) very few respondents use mosquito protect long clothes 5.4% with 95% CI(2.5-7.4), cut unwanted trees and grass during rain season37.8%, used fan or air conditioner to reduce flying of mosquito 22.3%, used mosquito bed net 64.5%, use chemical insecticide spry 40.2%, with95% CI(34.5-46.3) use both window/door screen 55.4% with95% CI (49.8-61.1). This found were difference compared to present in research done in Malaysia military cadet showed that the participants always eliminated stagnant water around the house 61.7% and covered water containers 59.0%,wearing protective clothes 35.5%, cut trees/vegetation around the house 35.5%, use electric fan 32.2 %, and use mosquito bed net 27.2%. A little portion always used insecticide spray 24.0%, and window/doors screen 23.0 %.(18) This finding was also lower when compared to result obtained from Nepal, cleaning out garbage/trash 92%, using window screens to keep mosquitoes out of the house 81%, using insecticide sprays 80%, turning containers upside down to avoid water collection 90%, eliminating standing water around

the house 95% ,covering water containers in the home 95% (13). The resones for these difference may be poor awarness on preventive measure with in military personnels.

This study also found that, only 4.4% with 95% CI(2.0-6.8)were use bed net at day time while sleep or taking nape, the reaming were use at night time and also about 35.5%were not awareness about use of bed net ,The result of this study finding was lower when compared to the study presented in Nepal obtained that 70.0% were not aware about the use of mosquito net at day time and 100% were aware about the use of mosquito net for preventing from mosquito bite, followed by 99.4% use of coil/mat/liquid, 80.4% spray of insecticide, 79.7% screening(41).The difference of this result due to poor preventive practice awareness regarding dengue among army. This study found a significant association between monthly income and participant`s preventive practice. Similarly the findings from Pakistan showed, socio-economic status was significant with preventive practice(1) This is due to the high socioeconomic group showed better preventive practices.

Also the present study revealed that individuals who had participated in health education were significantly associated with overall preventive practice. Similar study conducted in Malaysia showed that, the level of knowledge on dengue and preventive measures among high school students before health education and after health education was a significant difference [(42), (43)].The reason for this side was, a health education program could be effective in improving the preventive practice of army personnel.

The participant`s knowledge was significant associated with overall preventive practice of dengue. This finding also indicated that the importance of knowledge to predict practice. Also this study was similar that the result conducted in Malaysia, a significant association between practice and knowledge was found as the knowledgeable participant had higher mean practice in comparison to the non-knowledgeable participants(16).

This study revealed that, the individual`s overall good attitude 63.5% with 95 % CI (58.1-69.3) was highly significant associated with preventive practice. The percentage of poor preventive practice obtained during this study was slightly higher than that obtained during the study done in Malaysia 55% of the respondents with good attitude also has association with good practice status towards dengue prevention (26).

CONCLUSION

This study found that overall good knowledge 158 (53.4%) and good attitude 188(63.5%). But it found participant`s poor preventive practice (56.4%) of dengue fever. Factors associated with over all poor preventive practice were monthly income; health education, knowledge, and attitude of participant's were significant associated with preventive practice. More emphasis must be given to health education can be given to more improve their awareness regarding dengue which can improve their poor preventive practice among military personnel.

Strength of the study:

1. Since there were no studies conducted in this study toward dengue fever and it can contribute as baseline data for further study.

2. The study was military community based and the response rate was high.

Limitation of the study:

This study has the following limitations:

1. Lack of domestic literatures done in similar study subjects

2. This study didn't address more associated factors because of lack of literatures done in specific study population.

3. This study was some important limitations like all surveys recall bias in the responses.

4. The study was conducted in only in south eastern command, Dire Dawa military camp that doesn`t represent the great majority of the military personnel.

5. The data was collected during conflict around the study area and especial mission was one of challenges during data collection for the first one week to calm the conflicts and there were lack of transport event at the study time.

6. This study was does not reflects about causal and effect relationship that is difficult to measure the effect of deferent factors for preventive practice of dengue fever.

8. RECOMMENDATINS

   Based on the findings of this study it is recommended that:

1. Military personnel's ought to be   properly use the personal protective like bed net, wear long T-shirt ,avoid flowering plants, screen window/door, protect himself when seat outside door at day time against dengue fever.

2. Health professions ought to be   giving frequent health education program regarding emerging of dengue infection.

3. Health providers ought to be spraying chemicals because , because there is very wide gap in spraying anti-mosquito chemicals in each military camp, and need to spray in whole military camps during the susceptible season to prevent the dengue from acquiring an epidemic form

4. The military commandants should strengthen military mobilization regarding prevention and dissemination of dengue fever Key messages, with full participation of the army personnel for prevention of dengue in eastern command.

5. Health director's bureau   ought to be   plan for prevention programs with involvement of health professionals so as to ensure that knowledge imparted army get translated into preventive practice as well is the emergent need and better supply of mosquito's bed net.

6. Dengue is re-emerging disease in eastern command and it will be needs further research on case control study.

9- REFERENCES

1. Nalongsack S, Yoshida Y, Morita S, Sosouphanh K, Sakamoto J. Knowledge, attitude and practice regarding dengue among people in Pakse, Laos. 2009.

2. Mohammad Nasir Abdullah, Wan Nor Hazimah Wan Azib, Harun. MABaMFM. The Effect Of Gender And Source Of Information Towards Knowledge, Attitude And Practice On Dengue Fever Prevention. 6-7 December 2013, Perak, Mlaysia. Paper ID.:ST_01.

3. WHO. Dengue and sever dengue, April 2017 [(Accessed date 04-10-2017).]. Available from: htt: //www.who.int-media center ,fact sheets/fs117/en/

4. Lutomiah J, Barrera R, Makio A, Mutisya J, Koka H, Owaka S, et al. Dengue Outbreak in Mombasa City, Kenya, 2013–2014: Entomologic Investigations. PLoS neglected tropical diseases. 2016;10(10):e0004981.

5. Ahmed YM, Salah AA. Epidemiology of Dengue Fever in Ethiopian Somali Region: Retrospective Health Facility Based Study.

6. WHO. weakly epidemiological record, No 30, , 91, 349–364, 29 Julay 2016, [(Accessed date 15-10-2017).]. Available from: http://www.who.int/wer

7. WHO. Dengue fever ,Côte d'Ivoire Emergencies preparedness, response 4 August 2017 [(Accessed date 15-10-2017).]. Available from: www.who.int/entity/csr/don/04-august-2017-dengue-cote-d-ivoire/en/ - 32

8. CDC. Dengue Virus Infection in Africa-. CDCEID journal Past Issue August 2011.;17(8).

9. Woyessa AB, Mengesha M, Kassa W, Kifle E, Wondabeku M, Girmay A, et al. The first acute febrile illness investigation associated with dengue fever in Ethiopia, 2013: A descriptive analysis. The Ethiopian Journal of Health Development (EJHD). 2016;28(3).

10. Bulletin EWE. Ethiopian Public Health Institute Center for Public Health Emergency Management-Ethiopia - Epidemiological Week 31 August/2017.

11. World Health Organization. Comprehensive guidelines for prevention and control of dengue and dengue hemorrhagic fever.Revised and expanded edition,in south EAST Asia-New Delih 20111 [(Accessed date09-10-2017).]. Available from: apps.searo.who.int/PDS_DOCS/B0109.pdf

12. bulletin Ewe. weekly epidemiological bulletin July,2017.

13. Dhimal M, Aryal KK, Dhimal ML, Gautam I, Singh SP, Bhusal CL, et al. Knowledge, attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in central Nepal. PLoS One. 2014;9(7):e102028.

14. Lakhiar JA, Sajid HMU, Khan MA. KNOWLEDGE, ATTITUDE AND PRACTICES RELATING TO DENGUE FEVER AMONG TEACHERS OF PESHAWAR GARRISON. Pak J Physiol. 2016;12(2):40-2.

15. Amarasinghe A, Kuritsky JN, Letson GW, Margolis HS. Dengue virus infection in Africa. Emerging infectious diseases. 2011;17(8):1349.

16. Sami Abdo Radman Al-Dubai, Kurubaran Ganasegeran, Mohanad Rahman Alwan, Saif-Ali MAAaR. Factoros affecting dengue knowledge attitude and practiceamong selectedUrban,semi-urban andrural community in Malaysia-. January 2013.; 44 (1).

17. Kwon D-H, Crizaldo RL. A Knowledge, Attitudes, and Practices (KAP) Study on Dengue Fever among the Rowenas Community in the Philippines1.

18. Hamid M, Lugova H, Mon A, Knight V. Awareness and practice related to dengue infection among military cadets in Malaysia. J Behav Heal. 2015;4(2):1.

19. Alhazmi SA, Khamis N, Abalkhail B, Muafaa S, Alturkstani A, Turkistani AM, et al. Knowledge, attitudes, and practices relating to dengue fever among high school students in Makkah, Saudi Arabia. Int J Med Sci Public Health. 2016;5:930-7.

20. Pradeep C, Achuth K, Manjula S. Awareness and practice towards dengue fever in Kannamangala village, Bangalore, Karnataka, India. International Journal Of Community Medicine And Public Health. 2016;3(7):1847-50.

21. F. M. Yussof AH, T. Zin2, T. M. A. R. Hussin, N. Kadarman and R. Umar knowledge of dengue among student in universitiy SultanZainal Abidin(Unisza), Terengganu, Malaysia and the influence of the knowledge of dengue on attitude and practice J Fundam Appl Sci. 2017.; 9((2S),): 199-216.

22. Keerti S Jogdand, Pravin N Yerpude. A Cross-sectional Study on Perception Regarding Dengue Fever among Mid-adolescent Boys in South India. Indian Journal of Public Health Research & Development, . April-June 2017, ;8(2).

23. Valantine B, Kumar RP, Vasudevan S, Sureshbabu J, Singh Z. Cross sectional study on knowledge, attitude and practice regarding dengue among adult population visiting a tertiary care hospital in Puducherry, India. International Journal Of Community Medicine And Public Health. 2017;4(3):623-7.

24. Chanthalay Sayavong, Jiraporn Chompikul, Somsak Wongsawass, Rattanapan C. Knowledge, attitudes and preventivebehaviors related to dengue vectorbreeding control measures among adultsin communities of Vientiane, capital ofthe Lao. PDRJournal of Infection and Public Health -Thailand. 2015;,8: 466—73.

25. Sahana Mohapatra, Aslami. AN. Knowledge, attitude and practice regarding dengue fever among general patients of a rural tertiary-care hospital in Sasaram, Bihar. Int J Community Med Public Health. 2016 Feb; ;3(2):586-91.

26. Mohamed Nur Adli Mohamed Kamel, Beulah Devakirubai Gnanakkan, Fatimah Zahidah Fauzi, Muhammad Ikram Hanafi, Geetha Selvarajah, Siti Amira Jabar, et al. The KAP Study on Dengue among Community in Taman Salak Baiduri, Sepang, Selangor,Malasiya. International Journal of Science and Healthcare Research July-September 2017;2(3).

27. Nur Ain M, Azfar M, Omarulharis S, Azfar H MA, Hafizah S, Adibah B A H. knowledge ,attitude and practice of dengue prevention among suburban community in Sepang, Selangore-Malasia- Akmal NInternational Journal of Public Health and Clinical Sciences e-ISSN : 2289-7577. March/April 2017.;4(2).

47

28. Ekra KD, Cherif D, Kouassi DP, Konan YL, Coulibaly D, Traore Y, et al. Determinants of practices for dengue diagnosis among healthcare professionals working in public hospitals of Abidjan, Cote dIvoire. Journal of Public Health and Epidemiology. 2017;9(8):212-8.

29. Qadir S, Ahmad I, Akhtar MN, Naeem H. Knowledge, attitude and practice about dengue fever among local population. Gomal Journal of Medical Sciences. 2015;13(2).

30. Uematsu M, Mazier CZ. Knowledge, Attitudes, and Practices Regarding Dengue among the General Population in Honduras. American Journal of Public Health Research. 2016;4(5):181-7.

31. Taksande A, Lakhkar B. Knowledge, attitude and practice (KAP) of dengue fever in the rural area of central India. Shiraz E-Medical Journal. 2012;13(4):146-57.

32. Nagoor K, Babu S, Kahn S, Kalluri RJ, John K. Knowledge, attitude and practice on dengue fever and its prevention and control measures in urban slums of South India. International Journal Of Community Medicine And Public Health. Augst-2017;4(8):3013-7.

33. Nur Siyaklah, Mahiyaddin, Rosmawati Mohamed Hamdi Jan Jan Mohamed, Ramly N. High knowledge on dengue but low practice among a resident in a low cost Flat in Ampang,Selangor. the- Malaysia Journal. 2016;8(1).

34. Mejía R, Ribó A, Quinteros E, López A, Villegas P, Vela XF, et al. Knowledge attitude and practices related on prevention of mosquito borne diseases and sanitation conditions in a Salvadoran urban community. J Occup Environ Med. 2016;4(4):83.

35. Rana MS, Shakil MSA. Knowledge, Attitude and Practice on Dengue Fever Transmission Among Urban and Periurban Residents of Dhaka City, Bangladesh. Tropical Medicine Journal.3(2).

36. Lugova H., Mohammad Wisman A.H., Feizal Knight V., A.M. A, . A Comparative Study on Dengue Knowledge and Preventive Practices between Pre-University and University Military Students in Malaysia Global Journal of Microbiology and Biotechnology. (2015), ;3(1):pp. 35-44.

37. Rao G, Minhat HS, KS2 H. predictors of practices related to dengue fever prevention among international students in university putra Malaysia SERDANG e-ISSN : 2289-7577. September/October 2016.;3(5).

38. Al-Zurfi BMN, Fuad MDF, Abdelqader MA, Baobaid MF, Elnajeh M, Ghazi HF, et al. Knowledge, attitude and practice of dengue fever and heath education programme among students of Alam Shah science school, Cheras, Malaysia. Practice. 2015;129:63.2.

39. A.A. Binsaeed, A.A. Sahli, E.M. Noureldin, W.S. Mohammed, O.M Dafa lla, A. Dahlan, et al. Knowledge, Attitudes and Preventive Practices of DengueFever among Secondary School Students in Jazan, Saudi Arabia. (2015);10 (3):747-57.

40. library EDDuh. urban profile University of Yangon Research Journal. 2015.

48

41. Bhaumika Sharma, Sudhir Regmi, Bijay Aryal, Mamata Sharma Neupane andMilan Lopchan Knowledge and Attitude of Dengue Fever among Clients from Dengue

   International Journal of Pharma& Biological Archives Nepal 2012; 3(6):1383-   1388.

42. Su Wei Ng, Sok Yee Lim, Mini Rani Mary Beth A study to determine the effectiveness   of health education on knowledge of dengue fever and preventive measures among

    high school students in a selected private school, Malaysia

     Su WN et al.Int J Contemp Pediatric. 2016 May;3(2):553-558

43. Balsam Mahdi Nasir Al-Zurfi, Maher D. Fuad Fuad1, Mohammed A. Abdelqader,

© GSJ

49

10. APPENDICE

Annex 1: English questionnaires

Instruction to interviewer: please, read the questions clearly and circle the answers given by the participants in the provided given numbers and fill in the blank space.

Check: date-------/------/2018

Location /area: ---------------

1. Socio-demographic characteristic data (table1)

Respondent code no---------------

Sr. No	Variables	Participant`s responses
101	What is your gender?	1) Male 2) Female
102	How old are you?	---------------(years)
103	Educational status	1) 1-10th grade 2) Preparatory 3) Diploma 4) Degree and above 5) Other specify--------
104	Military rank	1) no rank 2) lower rank 3) Lower officer 4) Higher officer
105	Ethnicity	1) Oromo 2) Amhara 3) Tigre 88) Other specify-----------
106	Current marital states	1) married 2) Not married 3) widowed 4) Divorced 5) Separated
107	Religion	1) Orthodox 2) Muslim 3) Protestant 88) Other specify--------------
108	Monthly income	--------------(birr)
109	Family size	---------------

50

2   Knowledge towards dengue fever questionnaires(table2)

No	Questions	Participant`s alternative answers	skip to
201	Have you ever heard about dengue fever?	0) yes 1) No ⟶	practice Q401
202	Where you did first heard about dengue fever?(more than one answer possible)	1) Health personnel 2) TV/radio 3) Newspaper, Magazine, printed materials 4) Relatives, family, friends, neighbors 5) Teacher and school activities 6) Billboards 7) Training 88) Other specify-----------------	
203	What do you think the cause of dengue fever?	1) Viral 2) Bacteria 3) protozoa 99) I don't know 88) other specify---------------	
204	Is dengue fever transmissible disease?	0) yes 1) No ⟶	Q 206
205	Mode of DF transmission	1) by infected mosquito bite 2) by blood transfusion 3) by sexual intercourse 99) I don't know 88) other specify---------------	
206	Do you know the symptoms of dengue fever?	0) yes 1) No ⟶	Q 208
207	What are the symptoms of dengue fever? (more than one answer possible)	1) Fever 2) Skin rash 3) Headache 4) Joint Pain 5) muscle pain 6) nausea and vomiting 7) Nasal bleeding 8) Shivering 9) pain behind the eyes 99) I don't know 88) other specify--------------	
208	Which one mosquito vector responsible for transmitting DF to human?	1) AedesAegypti 2) Anopheles mosquito 3) Filaria 4) Chikungunyain 99) I don't know 88) other specify--------------	

51

209	Dengue mosquito usually bites at what time?	1) Day time especially sunset and sun rise 2) at night time 99) I don't know 88) Other specify--------------	
210	Where do you think the mosquito usually breed cites?(more than one answer possible)	1) In the flower pots 2) uncovered pond 3) in the garbage, 4) discarded old tire 5) Trash cans 6) Stagnate water /drainage near to home 7) clean water in the uncovered barrel and Jerri cans 99) I don`t know 88) others specify-------------	
211	Dengue fever affects all age groups	0) Yes 1) No	
212	What do you do, when you and your family members are getting sick from dengue fever? (more than one answer possible)	1) use traditional medication at home 2) take the patient to health center/hospital 3) Private pharmacies 4) use enough rest and consuming fluids 88) other specify------------------	
213	A person who once got dengue infection cannot get dengue infection again.	0) yes 1) No	
214	Who should be responsible for dengue mosquito control?	1) Government only 2) Everyone has responsibility 3) Government and everyone has responsibility 99) I don't know 88) other specify---------	
215	Which medication is best to manage against dengue fever?	1) Asprain 2) Paracetamol 3) Antibiotics 99) I don`t know 88) other specify-------------	

52

3. Attitude towards dengue fever.

Instruction; please thick (√) in the column below, if the statement strongly disagree (1), Disagree(2), Neutral (Undecided) (3), Agree (4) and strongly agree (5) (table3).

No	Attitude Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
301	DF is a serious public health problem					
302	Dengue fever could be preventable.					
303	Everybody has risk of being getting dengue fever.					
304	Insecticide helps in reducing mosquito breeding					
305	Most effective method of controlling or preventing dengue infection is to eliminate the breeding place of the vector mosquitoes.					
306	Strong and healthy person will not get dengue infection					
307	You have an important role in dengue fever prevention					

53

2   Practice towards dengue fever questions (table4)

Sr.No	Questions	Participant`s Alternative answers	Skip to
401	Have you and your family ever been infected by dengue fever?	0) yes 1) No	
402	Do you protect yourself and your family from mosquito bite during day time?	0) Yes 1) no ⟶	Q-404
403	What prevention method(s) do you currently use to protect from dengue fever?(multiple answers are possible),	1)Covering storage water container 2)cleaning stagnant / drainage water 3)Use smoking /fogging 4) cleaning garbage 5) cleaning house 6) keep grass short around the house 7) use mosquito bed net 8) use insecticides 88) other specify-----------	
404	Do you have mosquito bed net?	0) yes 1) no ⟶	Q-406
405	When do you use mosquito bed net?	1) At day time while take nape/sleep 2) At night time 88) other specify----------	
406	Do you have flower plant around your home?	0) yes 1) no	
407	Do you have any water hold container like barrel, Jerri cans with water in and around your home?	0)yes 1) no	
408	Do you cover the water containers in your home?	0) yes 1) no	
409	Are you frequently changing the stored water in your home?	0) Yes 1) no ⟶	Q-411
410	How often do you change water in water containers in your house?	1) Once every week 2) Once every two weeks 3) Once every three weeks 4) Once a month 5) I am not frequently change 88) Other specify----------------	
411	Is there any open drainage water around your residence?	0) yes 1) no	
412	Do you use screening on windows / doors?	0)Yes 1) No	

54

413	Do you use air conditioner or fan during day time?	0)yes 1)No	
414	Do you use mosquito repellent/Buzz off cream in your skin?	0) Yes 1)No	
415	Is your house sprayed by insecticidal?	0) Yes 1) no	
416	Are you usually stayed around your home at day time?	0) yes 1) No	
417	What kind of clothes you usually wear in your home?	1) Short T-shirt 2) long T- shirt(body full dress) 88) Other specify-------------------	
418	Are you participated by health education on topics of dengue fever within the last three months?	0) yes 1) no	

Annex 2: Amharic version questionnaire

1. ☐☐☐☐☐☐ ☐☐ ☐☐-☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐ ☐☐ ☐☐☐☐☐☐ ☐☐ ☐☐

☐☐☐☐☐

☐☐☐☐☐☐ ☐☐------------

☐☐ ☐☐☐	☐☐☐☐	☐☐☐☐☐☐ ☐☐☐
101	☐☐	1) ☐☐☐ 2) ☐☐
102	☐☐☐	-------------(☐☐☐)
103	☐☐☐☐☐☐ ☐☐☐	1) 1-10☐ ☐☐☐ 2) ☐☐☐☐☐☐ 3) ☐☐☐☐ 4) ☐☐☐ ☐☐ ☐☐ ☐☐☐ 5) ☐☐ ☐☐☐ ☐☐☐☐--------------
104	☐☐☐☐☐ ☐☐☐☐	1) ☐☐ ☐☐☐☐ 2) ☐☐☐☐ ☐☐ 3) ☐☐☐☐☐ ☐☐☐☐ 4) ☐☐☐☐ ☐☐☐☐
105	☐☐☐☐ ☐☐☐ ☐☐;	1) ☐☐☐ 2) ☐☐☐ 3) ☐☐☐ 88) ☐☐ ☐☐☐ ☐☐☐☐-------------
106	☐☐☐☐ ☐☐☐	1) ☐☐☐ 2) ☐☐☐☐ 3) ☐☐☐☐☐/ ☐☐☐☐☐☐ 4) ☐☐☐☐/☐ 5) ☐☐☐☐☐☐ ☐☐☐☐
107	☐☐☐☐☐	1) ☐☐☐☐☐☐ 2) ☐☐☐☐ 3) ☐☐☐☐☐☐☐ 88) ☐☐ ☐☐ ☐☐☐☐ --------------
108	☐☐☐☐ ☐☐☐ ☐☐☐	--------------- (☐☐)
109	☐☐☐☐☐ ☐☐☐ ☐☐☐ ☐☐;	---------------

56

2. [non-Latin text]

[non-Latin text]

□/□	□□□	□□□□□□□ □□□	□□□
201	□□□□□□ □□□□□ □□□ □□□□□ □□□□□;	0) □□ 1) □□□ ⟶	}□□ □ 401
202	□□□□ □□□□□ □□□□□ □□□□□□ □□□□□ □□□□ □□□□ □□ □□□ □□□□;	1) □□□□ 2) □□□□□ 3) □□□□□ 99) □□□□□ 88) □□ □□ □□□□□-------------	
203	□□□□□□ □□□ □□□□□□ □□ □□□□ □□ □□□? (□□□□ □□□ □□□ □□□□)	1) □□□ □□□□□ 2) □□□□□□□□□□□ 3) □□□□□□□□□□□□□ □□□□□ 4) □□□□□□□□□□□□□□□ □□□□□ 5) □□□□□□□□□□□□□□ 6) □□□□□ □□ □□□□□□ 7) □□□□□ 88) □□ □□□ □□□□□------------	
204	□□□ □□□□□ □□□ □□::	0) □□ 1) □□□ ⟶	□□□ 206
205	□□□□ □□□ □□ □□ □□□□□□	1) □□□□ □□□□□□ 2) □□□ □□□	

	⬚⬚⬚⬚⬚⬚;	3) ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ 99) ⬚⬚⬚⬚⬚ 88) ⬚⬚ ⬚⬚ ⬚⬚⬚⬚------------	
206	⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚;	0) ⬚⬚ 1) ⬚⬚⬚ ⟶	⬚⬚⬚ 208
207	⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚; (⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚)	1) ⬚⬚⬚⬚ 2) ⬚⬚ ⬚⬚⬚⬚ 3) ⬚⬚⬚ ⬚⬚⬚ 4) ⬚⬚⬚⬚⬚⬚⬚ ⬚⬚⬚ 5) ⬚⬚⬚⬚ ⬚⬚⬚ 6) ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ 7) ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚ 8) ⬚⬚⬚⬚⬚⬚ 9) ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ 99) ⬚⬚⬚⬚⬚ 88) ⬚⬚ ⬚⬚ ⬚⬚⬚⬚------------	
208	⬚⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚;	1) ⬚⬚⬚ ⬚⬚⬚⬚⬚ 2) ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚ 3) ⬚⬚⬚⬚ 4) ⬚⬚⬚⬚⬚⬚⬚ 99) ⬚⬚⬚⬚⬚ 88) ⬚⬚ ⬚⬚ ⬚⬚⬚⬚------------	
209	⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚⬚ ⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚ ⬚⬚;	1) ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚ 2) ⬚⬚⬚⬚ 99) ⬚⬚⬚⬚⬚ 88) ⬚⬚ ⬚⬚ ⬚⬚⬚⬚------------	
210	⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚ ⬚⬚ ⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚;(⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚⬚)	1) ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚ 2) ⬚⬚⬚ ⬚⬚⬚ ⬚⬚ ⬚⬚⬚⬚ ⬚⬚ 3) ⬚⬚⬚⬚⬚ ⬚⬚⬚ 4) ⬚⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚ 5) ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚ 6) ⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚ 7) ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚ ⬚⬚ 99) ⬚⬚⬚⬚⬚	

		88) K?L □□□ □□□□-----------	
211	□□□□ □□□ □□□□□ □□□ □□□ □□□ □□□□□□	0) □□ 1) □□□	
212	□□□ □□□ □□□□□□ □□□□□ □□□□□ □□□ □□□□ □□□□□ □□□ □□□□□?	1) □□ □□□□□ □□□□ 2) □□ □□□□□□ □□□ □□□□ 3) □□ □□ □□□□ 4) □□□□ □□□□□□ □□ □□□ □□□□ 88) □□ □□ □□□□□-----------	
213	□□□ □□ □□□□□ □□□ □□□□□ □□ □□□□ □□□□ □□□ □□□□□□□	0) □□ 1) □□□	
214	□□□□ □□□□ □□□□□□ □□□□□ □□□□□ □□□ □□□□□□;(□□□□ □□□ □□□□ □□□□)	1) □□□□□□ 2) □□□□□□□ □□□□ 3) □□□□□□□ □□□□□□ □□□□ □□□ □□□□□ 99) □□□□□ 88) □□ □□ □□□□□-----------	
215	□□□□ □□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□ □□ □□□ □□□□;	1) □□□□□□ 2) □□□□□□□ 3) □□-□□□□□ □□□□□□ 99) □□□□□ 88) □□ □□ □□□□□-----------	

3. □□□□ □□□ □□ □□□□□ □□□□ □□□□□□ □□□□ □□□□□

□□□□□ □□□□□□ □□□□□□□ □□□□ □□□□□□□□□(5)□ □□□□□□(4)□ □□□□□□ □□ (3)□□□□□(2) □ □□ □□□ □□□□□□□(1)□□□ □□□□□ □□□□□

59

□□□□□ □□□□□□ □□□□□ □□□ □□□□□□ □□□□□□□ □□□ □□□□□ □□□ □□□ □□
□ (√) □□□□□ □□□□□□□□

□□ □□ □	□□□□□ □□□□□	□□□ □□□□□ □	□□□□□ □	□□□ □□	□□□□□ □	□□□ □□□□□ □
301	□□□□ □□□ □□□□ □□□□ □□ □□□ □□□□					
302	□□□□ □□□□ □□□□ □□□□□ □□□□□□					
303	□□□□ □□□ □□□□ □□□□ □□□ □□ □□□□ □□□ □□□□□ @□□□ □□□ □□					
304	□□-□□□ □□□□□ □□□□ □□□□□□ □□□□□ □□□□□□□□					
305	□□□□ □□□□ □□□□□□□ □□□□□ □□□□ □□□ □□□□□ □□□□ □□ □□□□□□ □□□□					
306	□□□□□ □□□ □□□ □□ □□□□ □□□ □□□□□□□□					
307	□□□□ □□□□ □□□□□□□ □□□□ □□ □□□ □□□□					

4. □□ □□□ □□□ u}SK□□ □□□□□ □□□□□

□□□□□ □□□□□□□□ □□□□□ □□□□ □□□□□ □□□ □□□□□ □□□□□□ □□□
□□□□□ □□□□□ □□□ □□□□ □□□□□□

□/□	□□□□□	□□□□□□ □□□□ □□□□	□□□

401	☐☐☐☐ ☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐ ☐☐☐☐;	0) ☐☐ 1) ☐☐☐	
402	☐☐☐☐☐ ☐☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐;	0) ☐☐ 1) ☐☐☐ ⟶	☐☐☐ 404
403	☐☐☐☐ ☐☐ ☐☐☐ ☐☐☐ ☐☐ ☐☐☐☐☐ ☐☐☐☐☐☐ ☐☐☐☐ ☐☐☐ ☐☐☐☐☐☐ ☐☐ ☐☐☐☐ ☐☐☐☐☐☐ ☐☐ ☐☐☐☐☐; (☐☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐☐☐ ☐☐☐☐)	1) ☐☐☐ ☐☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ 2) ☐☐☐ ☐☐☐☐ ☐☐☐☐☐☐ 3) ☐☐☐ ☐☐☐ ☐☐ ☐☐☐☐ 4) ☐☐☐ ☐☐☐ ☐☐ ☐☐☐☐☐ 5) ☐☐☐☐ ☐☐ ☐☐☐☐☐ 6) ☐☐☐☐☐☐ ☐☐☐ ☐☐☐☐ ☐☐ ☐☐☐☐☐ ☐☐ ☐☐☐ ☐☐☐☐☐☐ 7) ☐☐☐☐☐ ☐☐☐☐☐ 8) ☐☐-☐☐☐☐ ☐☐☐☐ ☐☐☐☐☐☐ 88) ☐☐ ☐☐ ☐☐☐☐ ----------------	
404	☐☐☐☐ ☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐/ ☐☐☐☐ ☐☐;	0) ☐☐ 1) ☐☐☐ ⟶	☐☐☐ 406
405	☐☐☐☐ ☐☐ ☐☐☐☐ ☐☐☐☐/☐☐☐☐☐☐ ☐☐ ☐☐ ☐☐☐☐☐☐☐;	1) ☐☐☐ ☐☐☐☐ ☐☐ ☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ 2) ☐☐☐ ☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ 88) ☐☐ ☐☐ ☐☐☐☐ ----------------	
406	☐☐☐☐ ☐☐☐ ☐☐☐☐☐ ☐☐☐☐ ☐☐ ?	0) ☐☐ 1) ☐☐☐	
407	☐☐☐☐ ☐☐☐ ☐☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐☐☐☐ ☐☐☐☐ ☐☐☐☐☐☐ ☐☐ ☐☐☐☐☐/☐☐☐☐☐/☐☐☐ ☐☐;	0) ☐☐ 1) ☐☐☐	
408	☐☐☐ ☐☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐;	0) ☐☐ 1) ☐☐☐	
409	☐☐☐☐ ☐☐☐ ☐☐☐☐☐☐☐☐ ☐☐ ☐☐☐☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐?	0) ☐☐ 1) ☐☐☐ ⟶	☐☐☐ 411

61

410	□□□□ □□ □□□ □□□□ □□□□□ □□ □□□□□;	1) □□□□□ □□□ □□ 2) □□□□□ □□□□ 3) □□□□ □□□□ □□□ □□ 4) □□□ □□□ □□ 5) □□□□□ □□□□□□□ 88) □□ □□ □□□□--------------	
411	□□□□ □□□□ □□□□□□ □□□ □□□ □□ □□;	0)□□ 1)□□□	
412	□□□ □□□□□ □□□ □□□□ □□□□□ □□□□ □□□□;	0)□□ 1)□□□	
413	□□□ □□□□ □□□ □□□□□□ □□□□□ □□□□;	0)□□ 1)□□□	
414	□□□□ □□ □□-□□□ □□□□□ □□□ □□□ □□□□□ □□□□;	0) □□ 1) □□□	
415	□□□□ □□□ □□□□□□ □□□□□ □□□□□ □□□□;	0) □□ 1) □□□	
416	□□□ □□□ □□□□□□ □□ □□□□ □□ □□ □□□□ □□□□ □□□□;	0) □□ 1) □□□	
417	□□□□ □□□ □□ □□□□ □□□ □□□□□□ □□□□;	1) □□□ □□□□ 2) □□□□ □□□ □□□□□ 88) □□ □□□ □□□□---------------	
418	□□□□ □□□□ □□□□□□ □□□ □□□□□ □□□□□ □□□□ □□□□;	0) □□ 1) □□□	

□□□□ □□□□ □□□□□□ □□□ □□□□□□ □□□ □□□□□□□□‼

Annex 3: Map of study settings

The study site of   Dire Dawa military camp found in, 02, 03, 04 and 09 kebele .

Source- Ethiop. J. Health Dev. 2014; 28 (3)