ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

DEPARTMENT OF ZOOLOGICAL SCIENCE

General Biology program

The Assessment of Knowledge, Attitude and Practices/KAP/ on Tuberculous/TB/ among high school students of Keranio Medhanialem General Secondary School, Addis Ababa, Ethiopia

By

Lidiya Fesseha Belay

September, 2024

Addis Ababa, Ethiopia

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A Thesis submitted to Addis Ababa university, college of Natural and Computational Science, Department of zoological science in partial fulfillment of the requirements for Master of Science Degree in Biology

By: Lidiya Fesseha Belay

Advisor: Dereje Beyene (PhD)

September, 2024

Addis Ababa, Ethiopia

APPROVAL SHEET

Addis Ababa University

This is to certify that the thesis is prepared by Lidiya Fesseha, entitled; "The assessment of Knowledge, Attitude and Practices/KAP/ on Tuberculosis /TB/ among high school students of Keranio Medhanialem General Secondary School**,** Addis Ababa, Ethiopia" and submitted in partial fulfillment of the requirements for the awards of the degree of masters of science (M.Sc.) in Biology.

Approved by Board of Examiners

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DECLARATION

I declare that the work which is being presented in this thesis entitled “The assessment of Knowledge, Attitude and practices/KAP/ on Tuberculosis /TB/ among high school students of Keranio Medhanialem General Secondary School**,** Addis Ababa, Ethiopia” is my original work and has been completed independently with the guidance and support of my research advisor. More over the thesis has not been accepted for any degree in any other university or college, and that all source used in this research have been cited and acknowledged by means of complete reference.

Signature _____-

Lidiya Fesseha Belay

This thesis has been submitted for examination with my approval as university advisor.

Advisors Signature _____

Dereje Beyene (PhD)

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Abbreviations/ Acronyms

AFB	Acid fast bacilli
AIDS	Acquired Immunodeficiency Syndrome
BPaLM	A regimen of bedaquiline, pretomanid, linezolid and moxifloxacin
DOTS	Directly Observed Treatments
DS-TB	Drug-susceptible Tuberculosis
EMB	Ethambutol
HIV	Human Immunodeficiency Virus
KAP	Knowledge, Attitude and Practice
INH	Isoniazid
LMICs	Low- and Middle-Income Countries
LTBI	Latent tuberculosis infection
MDR-TB	Multi-Drug Resistant Tuberculosis
NTP	National Tuberculosis Program
PZA	Pyrazinamide
RIF	Rifampin
SPSS	Statistical Package for social science
TB	Tuberculosis
WHO	World Health Organization

ABSTRACT

Tuberculosis is a contagious bacterial infection caused by Mycobacterium tuberculosis. It primarily manifests as a pulmonary infection, but it can also affect other parts of the body. According to world health organization (WHO), millions of new cases emerge annually, and tragically, millions lose their lives to the disease. Therefore, identifying the knowledge, attitude and practice gap and associated factors, and taking active measures towards the gap helps to end TB in 2030. The aim of this study to assess knowledge, attitude and practice (KAP)of tuberculosis transmission and prevention among Keranio Medanialem Secondary Students. The study was institutional based cross-sectional study employed on 230 study participants. Quantitative data were analyzed by using Statistical Package for Social Science (SPSS)software version 20, statistical analysis of significance association was reported using analysis of variance with 95% confidence interval and p- value less than 0.05 in multivariate logistic regression. The result of the study showed that (46 %) of the students have good over all knowledge, (29.6%) have positive attitude and (42.2%) good practice towards TB prevention. among 230 respondents only 24.3%replied the causative agent of TB bacteria and 41.7%thought it was viruses. and 55%of participant TB can be transmitted by coughing and sneezing without covering mouth and nose ,68.2% replied opening windows in public transport and class reduce the risk of transmission of TB. Practice of avoiding overcrowding places helps to prevent TB. 68.3% of respondent do not get ashamed if they have TB and 64.3% belief that TB can be fully cured if drugs are taken properly according to the prescription of the medical worker. Most respondents want to get information related to TB in the future through drama and social medias (51.7%) and (30.4%) respectively. Generally, this study indicated that the knowledge, attitude and practice in the study area were not comparable to the information they received, Health education on TB, effective TB education, that bring changes in the knowledge wise and attitudinal change and strengthening of health clubs in school are recommended to end TB

Key words: *knowledge; Attitude and practice; Mycobacterium tuberculosis*, secondary school;

1. Introduction

Tuberculosis (TB) has been known as a human infectious disease for decades and is still a significant global health problem. Despite advances in diagnostic tools, the availability of effective anti-TB therapy, and substantial global efforts about 10.6 million people fell ill with TB worldwide, of which 5.8 million were men ,3.5 million were women and 1.3 million were children. Globally in 2022, TB caused an estimated 1.30 million deaths including 167,000 people with HIV (WHO, 2023).

Worldwide, tuberculosis (TB) was the second leading infectious disease killer after COVID-19. It was also the leading killer of people with HIVand a major cause of death related to antimicrobial resistance (WHO ,2023). In2017 about 10 million TB cases were estimated to occur, a third of them were missed, and about 1.6 million died in the same year (WHO, 2018). TB is inequitably distributed and clustered among disadvantaged and socioeconomically deprived population groups (Marais *et al*, 2009). TB is primarily a disease of the poor and its magnitude is high in socially disadvantaged populations or people residing in poor living condition, which are characterized by lack of education, poor housing, inadequate nutrition, overcrowding, and socioeconomic factors. Lack of awareness prevails in populations living in poor conditions, which leads to delay in health care-seeking due to lack of knowledge about the symptoms of TB and of prevention measures. Lack of awareness, in turn, leads to further transmission of the disease and poor treatment outcomes.

Due to a multitude of causes, TB has the highest mortality rate of all infectious diseases in "low- and middle-income countries". (Churchyard *et al*, 2014). Poor access to health-care facilities, weak TB preventive and control systems, individuals' poor nutritional status, a high prevalence of human immunodeficiency virus (HIV), and other factors and drug addiction all lead to the high incidence of TB in LMICs (Churchyard *et al*, 2014). Ethiopia, like other LMICs, is experiencing an increase in TB incidence since 2001, posing major challenges for the public healthcare system and national TB-control efforts (WHO, 2019).

Although the number of people dying from TB has started to decrease since the introduction of directly observed treatment short-course (DOTS), it still is one of the top causes of mortality (Marais *et al*, 2009).The decline of TB in developed countries is associated with improved living conditions and level of literacy however poor living conditions, lack of awareness, stigma, poor health care–seeking behavior, and deficient health systems favor TB transmission and occurrence of disease in developing countries (Carter*et al*, 2018).

Studies have shown that awareness about TB and the availability of health centers, in settings with high burdens of human immunodeficiency virus (HIV) is associated with high prevalence of TB (Pengpid *et al.* 2016). Generally, TB-related knowledge and attitudes vary across countries, ranging from an understanding of its infectious cause to the belief that its cause is the evil eye, and from supportive to highly stigmatized views toward the disease and patients. Adequate knowledge and positive attitudes about TB patients are expected to contribute to improved health care–seeking behavior. However, awareness about TB and the availability of services are often found to be suboptimal among underprivileged social groups, and illiterate, inaccessible, rural, and impoverished communities (Chang and Cataldo, 2014). Ethiopia is one of the countries with the highest TB, TB/HIV, and MDR TB burdens, with an estimated national TB incidence of 132 per 100,000 population and 108,714 notified new and relapse cases in 2019 (WHO, 2019; Girma *et al.*, 2018).

The National Tuberculosis Program (NTP) implemented TB programs for decades and rapidly decentralized TB services. However, the NTP continues to miss about a third of estimated TB cases. This could be due to lack of awareness about TB, lack of access, poverty, and TB-associated stigma, as indicated by studies conducted in some parts of the country (Shi *et al*., 2009). Therefore, understanding knowledge, attitudes, and practices (KAPs) related to TB and their underlying causes is important to design national responses to improve TB services in the communities of Ethiopia. Good public understanding of tuberculosis (TB), its cause, signs and symptoms, mode of transmissions and treatment is considered to be important for prompt health care seeking, adherence to treatment and reduction of stigma associated with the disease. In response this study proposed to explore factors associated with the transmission of the TB and social setting of the study population

1.1 STATEMENTS OF THE PROBLEM

According to world health organization, tuberculosis is the second leading infectious killer after COVID 19(above HIV and AIDS) (WHO,2023). It is the most dangerous infectious disease causing a major problem for public health globally. Ethiopia is a high TB burden country that is highly affected by tuberculosis

The public awareness, attitude and behavior toward TB prevention treatment and control must be adequate for the aims of TB control to achieved. Adolescent aged from 19-22 are the main high-risk population of pulmonary tuberculosis the disease is transmit through air when

a person cough, sneezes, sings or talks. Lack of knowledge and negative attitude toward TB create immense challenges in the prevention, controlling and curing of TB disease. This study aimed to understand the current status of knowledge, attitude and practice (KAP) about TB among Keranio Medhanialem Secondary Students. This provides a basis for building reversing mechanism for health education on TB prevention and treatment in high schools.

1.2. Objective of the study

1.2.1. General objective of the study

The purpose of this study is to explore on the knowledge, attitude and practices regarding TB among Keranio Medhanialem General Secondary School students.

1.2.2. Specific Objectives

The specific objectives of the study will be:

- To identify the level of TB knowledge among study population
- To describe the attitudes of students towards TB.
- To assess the practice of students to prevent TB
- To investigate the association of demographic and socio-economic factors with TB(KAP).

1.4. Scope of the study

The scope of this study was delimited in Kolfe Keranyo Subcity, Woreda 08, specifically in Keranio Medhanialem General Secondary School students. Even if, Keranio Medhanialem General Secondary School consists of students from grade 9 up to grade 12, this study was delimited on grade 11 and 12 students.

1.5. Significance of the Study

Ethiopia is among the high TB burden countries where the knowledge, attitude and awareness of the population is important for control of the transmission of the disease among the population. However, the dynamics of the relationship between socioeconomic development and TB epidemiology, and the causal pathways that link the transmission of the disease among students were not fully understood. Thus, the research finds outs the important gaps that exist among the differential knowledge, attitude and practice prevails among high school students. Therefore, it identifies important socioeconomic parameters and associated factors.

The identified gaps could be improved through creating awareness campaigns and this potentially reduces the transmission of the disease among population.

Moreover, the information generated will be useful for running of co-curricular activities such as TB and HIV club (health club) and also redesigning the existing practices in the school. Thus, the study finding have an impact in the co-curricular activities of the school and in the meantime in raising KAPs regarding TB disease transmission. This align with the country health policy which is pillaring on disease prevention and control where the nation will benefit largely by raising KAPs of the high school students.

2. LITERATURE REVIEW

2.1. Tuberculosis/TB/

Tuberculosis (TB) is a communicable disease caused by the bacterium *Mycobacterium tuberculosis* in humans; it affects several organs of the body. There are several other species of genus *Mycobacterium* that are also human pathogens, but all of these organisms are of much lower virulence than *Mycobacterium tuberculosis*. The primary site for active TB infection is the lungs; this is referred to as pulmonary TB. Patients with pulmonary TB usually have a cough and abnormal chest radiography image (Haasnoot *et al,* 2010)

Although latent infection is possible, the bacteria are inactive in this form and the person is not contagious. Without treatment, approximately 5% of persons who have been infected with *M. tuberculosis* will develop TB disease in the first two years after infection, and another 5% will develop TB disease sometime later in life. Thus, without treatment, approximately 10% of persons with normal immune systems who are infected with *M. tuberculosis* will develop TB disease at some point in their lifetime (CDC, 2021).

The tubercle bacillus is well known for individual strains that vary independently in both virulence and antibiotic resistance. There are variations from one individual to the other. In some people, the tubercle bacilli overcome the immune system and multiply, resulting in progression from latent tuberculosis infection (LTBI) to active TB disease. Persons who have TB disease are usually infectious and may spread the bacteria to other people. The progression from LTBI to active TB disease may occur at any time, but it is most common within the first two years of infection or in the context of certain medical conditions (Amare *et al*., 2018). As the cellular processes occur, tuberculosis may develop differently in each patient, according to the status of the patient's immune system, Stages include latency, primary disease, primary progressive disease, and extrapulmonary disease. Each stage has different clinical manifestations (Table 1).

Table 1:Differences in the stages of Tuberculosis (adopted from Thrupp et al,2004; Brayan andRapp,2006)

Early infection	Early primary progressive (active)	Late primary progressive (active)	Latent
• Immune system fights infection • Infection generally proceeds without sign or symptoms • Patients may have fever, paratracheal lymphadenopathy or dyspnea • Infection may be only subclinical and may not advance to active disease	• Immune system does not control initial infection • Inflammation of tissue ensues • Patients often have nonspecific signs or symptoms (e.g., fatigue weight loss, fever) • Nonproductive cough develops • Diagnosis can be difficult: findings on chest radiographs may be normal and sputum smears may be negative for mycobacteria	• Cough becomes productive • More signs and symptoms as disease progresses • Patients experience progressive weight loss, rales, anemia • Findings on chest radiograph are normal • Diagnosis is via culture or sputum	• Mycobacteria persist in the body • No sign or symptoms occur • Patients are susceptible to reactivation of disease • Granulomatous lesions calcify and become fibrotic, become apparent on chest radiographs • Infection can reappear when immunosuppression occurs

In general, the severity of disease caused by TB infection is dependent on three major factors- the virulence and dose of the particular strain of TB bacteria, the patients' level of immunity and strength of resistance and the lack of timely or inappropriate selection of drugs for the right duration (Dauby *et al*, 2011). The global TB-related deaths showed a declining trend due to reducing the health risk factors (smoking, diabetes and HIV infection), adequate provision of treatment to latent TB infection, and multi-sectorial action on TB - determinants (poverty, housing quality and under nutrition). However, further efforts are required to end TB and achieve the 2025 strategy plan. Thus, universal health coverage, and multi-sectorial approach towards border determinants such as poverty, housing quality and under-nutrition are the major challenges of TB control (WHO, 2019).

Approximately, 10 million in 2020, 10.3 million in 2021 and 10.6 million in 2022 people fell ill with TB worldwide. (WHO ,2023). The most important cause, of world- wide increase in TB are; non–compliance with control program, in-adequate diagnosis and treatment, migration, Human immune deficiency virus (HIV), ambulatory and self-administered treatment and increasing drug resistance (Pilheu, 2000).

During the COVID-19 pandemic, important tuberculosis services were not offered to many people who needed them. As a result, newly diagnosed cases decreased from 7.1 million in 2019 to 5.8 million in 2020. In 2021, the number increased to 6.4 million, but remained below pre-pandemic numbers (WHO,2023). This decreases relative to before the COVID-19 pandemic suggests an increase in undiagnosed and untreated tuberculosis cases, initially leading to increased community spread of the infection and tuberculosis deaths followed by a rise in the number of people developing the diseases (WHO, 2023).

2.1.1. TB-transmission-mechanisms and factors contributes for transmission

Tuberculosis is spread through droplet nuclei that become aerosolized when an infected person coughs, speaks, sings or talks (Fig. 1). so, droplet infection is the main means of transmission of tuberculosis. Droplets produced by TB may contain airborne infectious particles, which cause TB infection in other susceptible individuals who become exposed (Haasnoot *et al*, 2010).

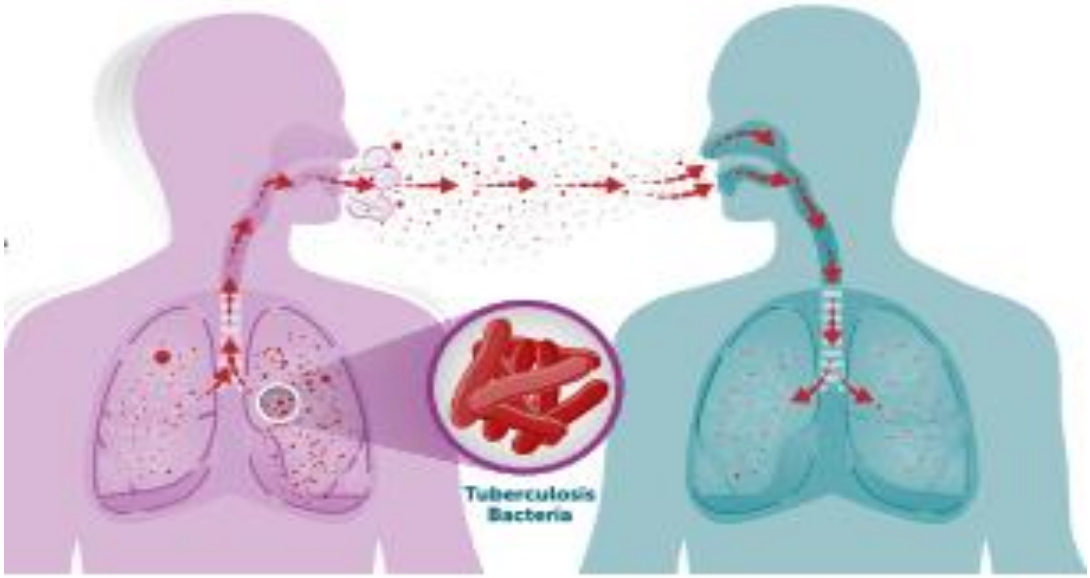


Figure 1: Pathogenesis and transmission of tuberculosis. Source: (CDC, 2021)

Not everyone who is exposed to a person with infectious TB becomes infected. There are four factors that determine the probability of transmission of *M.tuberculosis* (Table 2). The infectiousness of a person with TB disease is directly related to the number of tubercle bacilli that he or she expels into the air (Table 4). Persons who expel many tubercle bacilli are more contagious than those who expel few or no bacilli. There is also susceptibility, environmental, and exposure factors that can affect the transmission of TB (Table 2).

A young children with pulmonary and laryngeal TB disease are less likely than adults to be infectious. There are two reasons for this: first, TB in young children is often paucibacillary, meaning that children are infected with fewer organisms compared to adolescents and older children. Second, young children do not often cough with enough force to expel organisms into the air. Nonetheless, transmission from children, especially older adolescents with features of adult disease (e.g., cavitary or sputum smear-positive disease), can occur. Therefore, children and adolescents with TB disease should be evaluated for infectiousness using the same criteria as adults (CDC, 2021).

*Table 2:*Factors that determine the probability of Transmission of M. tuberculosis

Factors	Description
Susceptibility	Susceptibility (immune status) of the exposed individual
Infectiousness	Infectiousness of the person with TB disease, which is directly related to the number oof tubercle bacilli that he or she expels into the air
Environmental	Environmental factors that affect the concentration of *M. tuberculosis* organisms
Exposure	Proximity, frequency, and duration of exposure

Table 3:Characteristics of a patient with TB Disease that are associated with infection

Factor	Description
Clinical	Presence of cough, especially lasting 3 weeks or longer Respiratory tract disease, especially with involvement of the larynx (highly infectious) Failure to cover the mouth and nose when coughing Inappropriate or inadequate treatment (e.g drugs, duration
Procedure	Undergoing cough -inducing or aerosol-generating procedures (e.g. bronchoscopy. sputum induction administration of aerosolized medications)
Radiographic and laboratory	cavitation on chest radiograph Positive culture for M.*tuberculosis* Positive acid -fast bacilli (AFB)sputum smear result

Table 4: Environmental factors that enhance the probability *that M. tuberculosis* will b*e* transmit

Factor	Description
Concentration of infectious droplet nuclei	The more droplet nuclei in the air, the more probable that *M. tuberculosis* will be transmitted
Space	Exposure in small, enclosed spaces
Ventilation	Inadequate local or general ventilation that results in insufficient dilution or removal of infectious droplet nuclei
Air circulation	Recirculation of air containing infectious droplet
Specimen handling	Improper specimen handling procedures that generate infectious droplet nuclei
Air pressure	Lack of negative air pressure in infectious patient's room that cause *M. tuberculosis* organisms to flow to other areas

If the proximity of a susceptible to an infector is ignored, then the probability of an individual to acquire TB infection is primarily dependent on the duration of exposure to the infector (Beggs *et al*, 2003). If the concentration of airborne infectious particles in the room is high, the duration of exposure before infection occurs will be short. If airborne infectious particles concentrations are low, the safe exposure duration will be much longer. This is because TB infection depends on-the threshold concentration and number of airborne infectious particles required to dominate the-immunological state of the host (Sze and Chao, 2010). Duration of exposure is defined as the time individuals spend in a confined space with the probability of being infected, if there is an infectious individual. The word exposure can be defined as contact interaction between two or more individuals within confined spaces where the environment of the given space can trigger infection for susceptible individuals (WHO, 2012). Extensively high exposure mostly occurs among persons who share the same dwelling or who spend long periods of time in enclosed spaces with an infectious individual. In overcrowded areas such as townships, prisons and schools, where duration of exposure is long, the number of TB transmission particles is also extremely high, so the number of people who could be exposed to a single infectious individual is high (Johnstone, 2011). However, in-rural-areas the situation is not as critical because the number of people who become exposed to a single infectious individual is smaller than urban areas as rural areas have low population density. In addition, regardless of rural areas or urban areas, TB transmission

depends on the population density in the household, nature of the dwelling and interactions which trigger the risk of exposure, provided that there is an infectious individual in the given household. Therefore, population density plays a big role in the transmission of tuberculosis in the community (Beggs *etal*,2003). Duration of exposure sometimes depends on the weather and climatic conditions, for instance, during winter the duration of exposure is very high because most people prefer indoor activities and stay in confined spaces to maintain body temperature. In some countries, such as northern Europe, which have long, cold winters, outdoor social activities are scarcer than in warm climates (WHO, 2012). Airborne infectious particles expelled indoors by an infected person in a confined space are retained and evenly distributed anywhere in poorly ventilated spaces, which causes infection over a long period of exposure (WHO, 2012). Thus, if individuals enter that confined space, they may become infected even if an infectious individual has left, depending on the duration of exposure and their immune system. However, airborne infectious particles disperse rapidly if expelled outdoors and die quickly because they become exposed to high air flow and ultraviolet irradiation from the sun (Rieder, 1999). This implies that TB transmission particles spread more rapidly in cold climates than warm climates because outdoor social activities are reduced due to the cold, and indoor ventilation becomes poor since windows-are kept for a long period of time. This affects duration of exposure (Beggs *et al,* 2003).

2.1.2. The pathology of *Mycobacterium tuberculosis*

Mycobacterium tuberculosis is a slow growing mycobacterial species with a generation time of around 16-24 hrs. It is a gram-positive acid-fast aerobe and unlike other gram-positive bacteria, it has a thick and highly complex lipid-rich cell wall (Cook et al. 2009). This provides a hydrophobic permeability barrier that plays an important role in intrinsic antimicrobial resistance and the array of lipids and glycolipids are also thought to be important for bacterial pathogenicity (Neyrolles and Guilhot, 2011).

Infection occurs when a person inhales droplet nuclei containing tubercle bacilli that reach the alveoli of the lungs. These tubercle bacilli are ingested by alveolar macrophages. While most bacilli are destroyed or inhibited, a small number may multiply intracellularly and be released when the macrophages die. If alive, these bacilli may spread by way of lymphatic channels or through the bloodstream to more distant tissues and organs (including areas of the body in which TB disease is most likely to develop: regional lymph nodes, apex of the lung, kidneys, brain,

and bone). This process of dissemination primes the immune system for a systemic response (CDC, 2021).

M. tuberculosis is a highly specialized pathogen and the mechanisms underlying its virulence is complex and multifaceted. M. tuberculosis virulence involves the ability of the bacilli to survive extra-cellularly until a new host is found and then to invade, survive and multiply within host macrophages upon infection. Two centrals features of M. tuberculosis virulence are; (1) its ability to cause active disease leading to cavitation and the expulsion of bacilli allowing transmission as shown in Figure1 and (2) its capability to persist in a subclinical latent state whilst maintaining the potential to reactivate even decades after infection. In order to achieve this, the pathogen has developed sophisticated strategies and acquired virulence factors to enable it to survive in challenging environments, counteract host antimicrobial responses, persist in a non-replicative state, and facilitate the progression to active disease (Sassetti and Rubin, 2003).

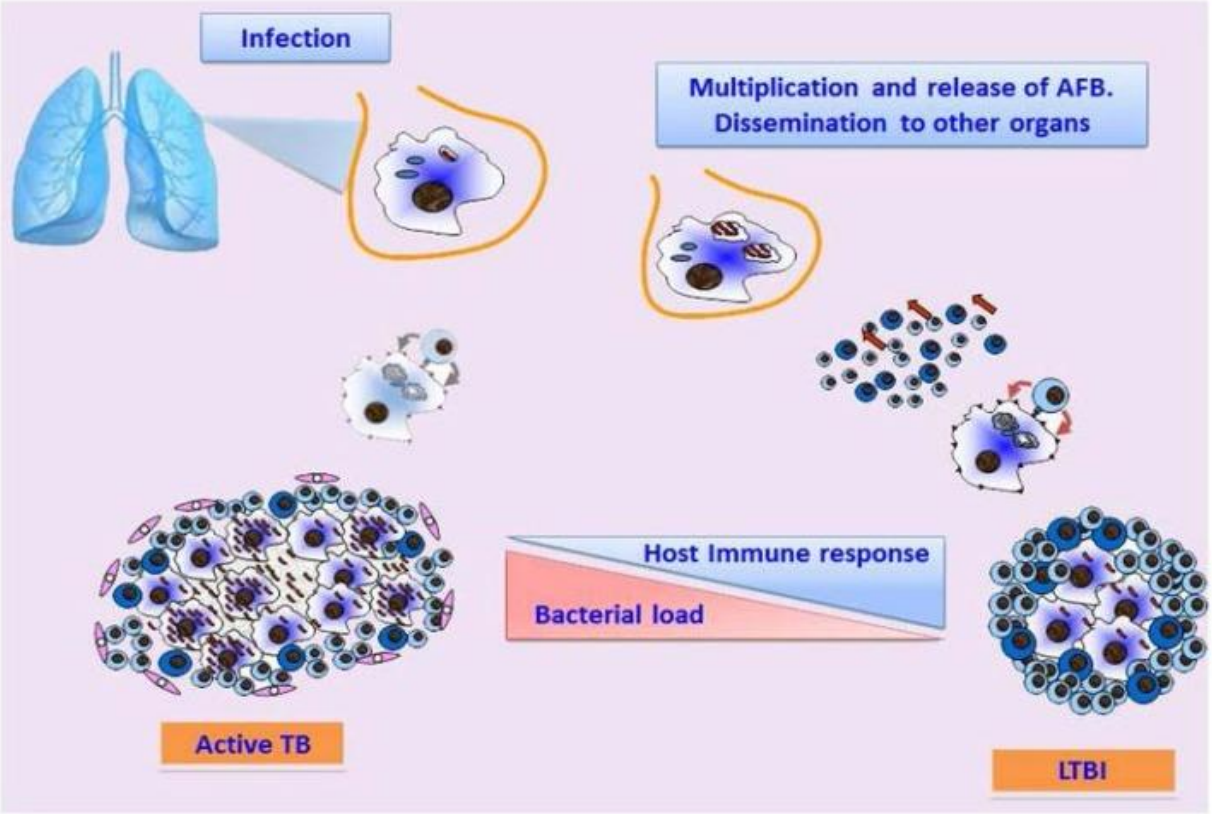


Figure 2: Interaction of host immunity and the *Mycobacterium tuberculosis* in the patient's alveoli/latent TB infection (LTBI)

2.1.3 Drug-resistant *Mycobacterium tuberculosis*

Drug-resistant TB strains can develop in two different ways called primary and secondary resistance. Primary resistance is caused by person-to-person transmission of drug-resistant organisms. Secondary resistance, or acquired resistance, develops during TB therapy because the patient was not treated with an adequate regimen or did not take the medications as prescribed, or because of other conditions such as malabsorption or drug-drug interactions. The different types of drug-resistant TB were described in Table 6 (MacGowan, 2008).

As clinical outcome cannot be determined prior to treatment, drug-resistance is generally defined based on drug-susceptibility of the bacterial population prior to treatment. Drug-resistant TB is also defined based on the drug-susceptibility of the *mycobacterium tuberculosis* population prior to treatment (Canetti *et al,* 2016). As a consequence, a patient with drug resistant-TB is a patient who harbors *Mtb* bacilli that are resistant to the drug concerned and the patient will fail to respond to treatment with the drug (Canetti *et al,* 2016). Globally, drug-resistant TB has been an area of growing concern and-poses a-dire threat to the effective control of TB (Sotgiu *et al,* 2016; Frieden *et al,* 2016). This threat is exemplified by the outbreak of drug-resistant TB in New York City in the early 1990s, with nearly all major hospitals reporting drug resistant TB cases and fatality rates greater than 80%. Multidrug-resistant TB (MDR TB) is caused by organisms that are resistant to the most effective anti-TB drugs, isoniazid and rifampicin. These drugs are considered first-line drugs and are used to treat most persons with TB disease. According to the WHO, in 2022, an estimated 410,000 new cases of MDR-TB occurred. About 17% of previously treated TB cases developed MDR-TB, while 3.3% of new TB patients had MDR-TB. Still, in the same year, 160,000 patients with MDR-TB died. More disturbing is the tendency of MDR-TB patients to progress to more severe forms of drug-resistance such as extensively drug-resistance TB (XDR-TB). XDR-TB is M tb with in-vitro resistance to at least RIF, INH, a quinolone, and 1 of 3 second-line injectable agents. Globally, the estimated proportion of MDR-TB cases with pre- XDR TB was 18% (WHO, 2023).

Table 5: Types of drug-resistant TB (WHO | Global tuberculosis report 2023*)*

	Form of drug resistant TB	Definition
1	Mono -drug resistance	Resistance to one first line ant -TB drug only
2	Poly -drug resistance	Resistance to more than one first line anti -TB drug ,other than both isonizid and rifampicin
3	Multi drug resistance (MDR)	Resistance to at least both isonizid and rifampicin
4	Extensive drug resistance (XDR)	Resistance to any fluoroquinolone,and at least one of three second line injectable drugs(capreomycin,kanamycin and amikacin)in addition to multidrug resistance
5	Rifampicin resistance (RR)	Resistance to rifampicn detected using phenotypic or genotypic methods with or with out resistance to other anti -TB drugs. It includes any resistance to rifampicin ,in the form of mono -resistance ,poly-resistance ,MDR or XDR.

2.1.4. DIAGNOSIS

Active tuberculosis may be considered as a possible diagnosis when findings on a chest radiograph of a patient being evaluated for respiratory symptoms are abnormal, as occurs in most patients with pulmonary tuberculosis. The radiographs may show the characteristic findings of infiltrates with cavitation in the upper and middle lobes of the lungs (Thrupp *et al*, 2004) (Figure 3).

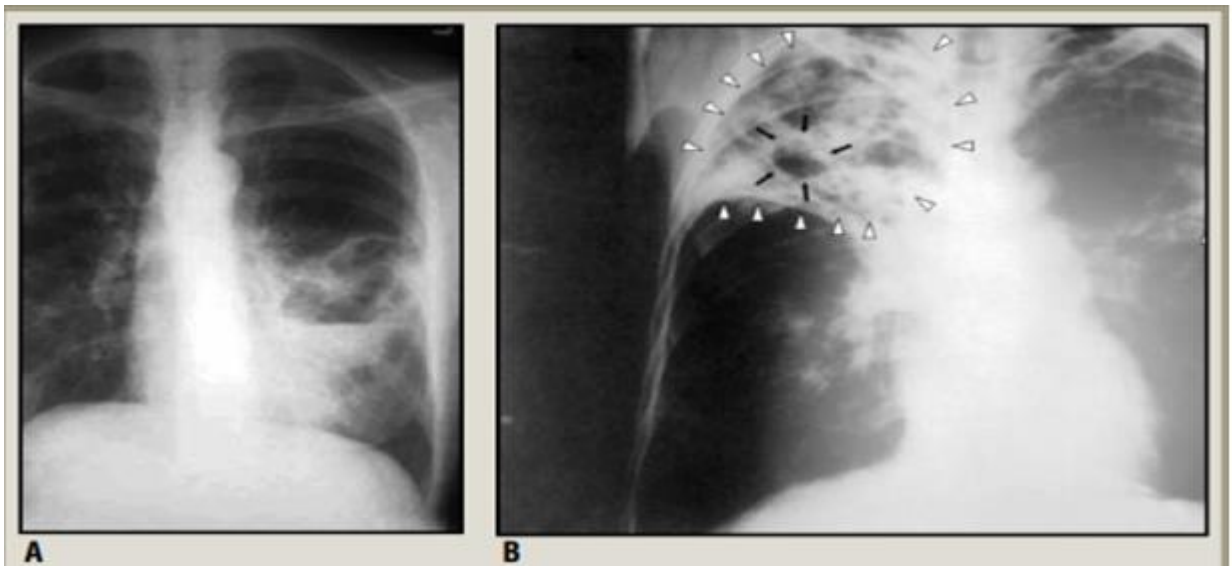


Figure 3: Chest radiography in pulmonary TB. A, Infiltration in left lung. B, Bilateral advanced pulmonary tuberculosis and cavitation in apical area of right lung. (Thrupp et al, 2004).

However, specific groups of patients, such as the elderly and patients with advanced infection by human immunodeficiency virus, may not have these typical findings. Compared with other patients, both groups have the classic cavitation less often and may have lower-lobe infiltrates as a prominent finding (Thrupp *et al,* 2004; Bryan and Rapp, 2006). Although abnormal findings on a chest radiograph may suggest tuberculosis, they are not diagnostic for the disease. Traditionally, the first laboratory test used to detect active tuberculosis in a patient with abnormal findings on chest radiographs is examination of a sputum smear for the presence of acid-fast bacilli (Table 6).

Table 6: Diagnostic test for identifying tuberculosis

Variable	Sputum smear	Sputum culture	Polymerase chain reaction	Tuberculin skin test	Quanti FERON TB test	Chest radiography	GeneXpert
Purpose of test or study	Detect acid fast bacilli	Identify *Mycobacterium tuberculosis*	Identify *M.tuberculosis*	Detect exposure to mycobacteria	Measure immune reactive to M tuberculosis	Visualize lobar infiltrates with cavitation	Detect TB and resistance to rifampicin
Time required for results	24 hours	3-6 weeks with solid media ,4-14 days with high -pressure liquid chromatography	Hours	48-72 hours	12-24 hours	Minutes	Hours

Definitive diagnosis of tuberculosis requires the identification of *M. tuberculosis* in a culture of a diagnostic specimen. The most frequent sample used from a patient with a persistent and productive cough is sputum. Because most mycobacteria grow slowly,3 to 6 weeks may be required for detectable growth on solid media. However, a newer, alternative method in which high performance liquid chromatography is used to isolate and differentiate cell wall mycolic acids provides confirmation of the disease in 4 to 14 days (Bryan and Rapp, 2006). Conventionally, three sputum samples were also used for culture diagnosis, but the use of two specimens, as mentioned earlier for smears, also applies for cultures (Leonard *et al,* 2005).

Extrapulmonary TB disease should be considered in the differential diagnosis of ill persons who have systemic symptoms and who are at high risk for TB disease. Symptoms shown in Table 3.1 associated with pulmonary and extrapulmonary TB disease can be caused by other diseases; however, these symptoms should prompt the clinician to consider TB disease (CDC, 2021).

Table 7: Symptoms of Pulmonary and Extra-pulmonary TB Disease

Symptoms of pulmonary TB Diseases	Symptoms of possible Extrapulmonary TB Disease
Cough (especially lasting for 3 weeks or longer) Chest pain Loss of appetite Unexplained weight loss Night sweats Fever Fatigue	Blood in the urine (may include TB of the kidney) Headache or confusion (may indicate TB meningitis) Back pain (may indicate TB of the spine) Hoarseness (may indicate TB of the larynx) Loss of appetite Unexplained weight loss Night sweats Fever Fatigue

2.1.5. Treatment of Tuberculosis

TB is a treatable disease. Its treatment regimens have been classically been divided into two phases, first is the intensive phase which includes the highest number of drugs with the aim to rapidly reduce the number of viable bacteria and reduce the risk of acquired resistance (Jindani *et al*, 2003). Theoretically, this targets rapidly dividing *M. tuberculosis* bacteria. and reduces its population size significantly. The continuation phase follows, where fewer drugs are used with the focus on targeting slowly replicating bacteria and reducing the risk of relapse (Jindani *et al*, 2003). Patients-with active-TB disease are treated with-a-6-month regimen of combined therapy composed of the four drugs: Rifampicin (RIF), Isoniazid (INH), Pyrazinamide (PZA), and Ethambutol (EMB). All four drugs are administered during the first 2-months but for the remaining 4 months, only RIF and INH are administered (Jindani *et al*, 2003). To ensure that patients comply with the lengthy duration of treatment, pharmacotherapy is usually administered through the Directly Observed Treatment and

Short-course drug therapy (DOTS) program. In the DOTS program, the health worker or community volunteer provides the drugs to the patient and observes Treatment of TB patients with the standard 6-month drug regimen of RIF, INH, PZA and EMB is expected to lead to treatment success in all patients who adhere to the regimen. Unfortunately, about 12 - 20% of TB patients fail treatment and another 3 –10% relapse within 2 years of completing their medication regimen, despite having drug-susceptible *Mtb* (WHO, 2009). Treatment failure is due to two major factors: (i) microbial and (ii) host factors. As shown in Fig 4, patients harboring persistent or drug-resistant *M.tb* are likely to fail treatment (WHO 2015). Likewise, patients with an impaired or compromised immune response or with inadequate plasma anti-TB drug levels are also likely to fail treatment (Farmer, 2015).

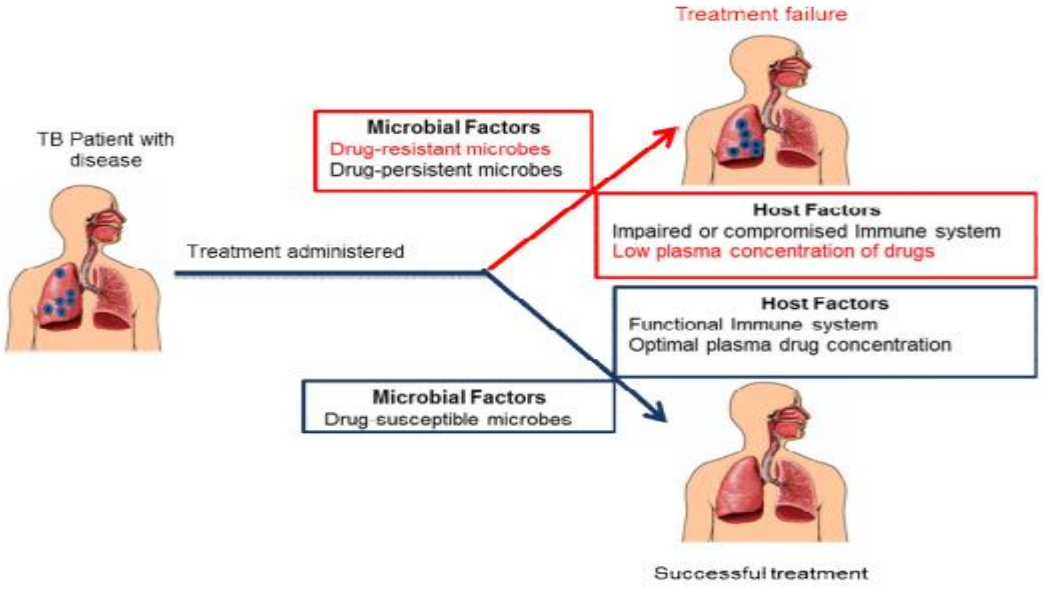


Figure 4: Microbial and Host factors that increase risk of TB treatment failure

2.1.5.1. Treatment of Drug-Susceptible Tuberculosis

Treatment of TB is also dependent on the resistance pattern of the infecting *M. tuberculosis* strain. These are divided into drug-susceptible TB (DS-TB), MDR-TB, pre-extensively drug-resistant TB (pre-XDR-TB), and extensively drug-resistant TB (XDRTB), which are predictive of treatment success. The definitions were updated in 2021 to reflect the new WHO-recommended regimens composition (WHO, 2023) (Table 8).

Table 8:Current treatment regimens for multidrug-resistant tuberculosis recommended by the World Health Organization (WHO, 2023)

Regimens 6-months BPaLM,since 2022	Grouping of drugs or included drugs
Three to four drugs in a standard combination	Bedaquiline +pretomanid+linezolid +/-
Intensive phase: Four to six months	Moxifloxacin (excluded when resistant to fluoroquinolones is present)
Total length: six months	
Shorter regimen, since 2016 Seven drugs in a standard combination. Intensive phase; four to six months Total length; Nine to twelve months	Bedaquiline+levofloxacin/moxifloxacin +ethionamide/prothionamide+ethambutol+highdose isoniazid+clofazimineq+pyrazinamide
All oral longer regimen since 2018 Four likely effective drugs in the intensive phase including all three drugs in group A and at least one drug in group B. Drugs from group C are added if a regimen cannot be composed of only Group A and B drugs Intensive phase; only if amikacin or streptomycin is included (given six to seven months Total length ;18-20 months	GroupA;Levofloxacin \moxifloxacin,bedaquiline,linezolid Group B ;Clofazimine ,cycloserine /terizodone GroupC;Ethambutol,delamanid pyrazinamide ,imipenem/meropenem. Amikacin /streptomycin,ethionamide/prothionamide,para-aminosalicylic acid

Until recently, the only treatment recommended for DS-TB was a six-month regimen consisting of rifampicin, isoniazid, pyrazinamide, and ethambutol for two months, followed by rifampicin and isoniazid for four months. The regimen was developed in the classic clinical trials led by the British Medical Research Council in 1946-1986 in mainly East and Central Africa, India, and Hong Kong (Fox *et al*, 1999). A treatment length of six months was a dogma in TB, until 2021, when the long-awaited results of the trial TBTC Study 31/ACTG A5349 were published. The trial showed non-inferiority of a four-month regimen for adults and included high-dose rifapentine (a rifamycin similar to rifampicin), moxifloxacin, and pyrazinamide (Dorman *et al*, 2021), and-is-now-endorsed by the WHO (2018). Moreover, a four-month regimen for children based-on-findings from the SHINE trial (Turkova *et al*, 2022) aimed at those with non-severe-disease, -is-also-recommended by

WHO and includes the four standard drugs for DS-TB. During the development of the standard treatment for DS-TB between 1946 and 1986, important traits of pyrazinamide treatment were discovered that led the way to the DSTB treatment regimen we have today (Fox*et al,* 1999). First, sputum culture conversion at two months was shown to increase with pyrazinamide treatment compared to ethambutol (Fox *et al,* 1999). Second, the sterilizing effect of pyrazinamide was demonstrated by a lower relapse rate with pyrazinamide treatment (10-23% compared to 3-7%). Thirdly, the synergistic effect of pyrazinamide and rifampicin was shown when similar relapse rates were found in six- and nine-month regimens when the two drugs were used together. Lastly, the effect of pyrazinamide treatment was only seen in the first two months of a treatment since no difference in relapse was found if pyrazinamide was given for two, four or six months (Fox *et al,* 1999)

2.1.5.2. Treatment of Multidrug-resistant tuberculosis/MDR-TB/

Literature generally associates high MDR-TB incidence with higher numbers of new infections than the health infrastructure can handle; low identification, diagnosis and retention of patients in care; poor patient outcomes; and development and spread of DR-TB (Kerantzas and Jacobs 2017). High costs of treating MDR-TB, longer hospital stays and treatment timelines (nine to 36 months), drug toxicity, serious side effects and generally poorer outcomes for patients negatively impact patient's willingness and ability to adhere to treatment until completion (Daku and Gibbs 2012).

Interrupting or abandoning treatment has serious implications for patients, their families, healthcare providers and others who are in regular contact with; who may acquire MDR-TB infection as a result (Kigozi *et al.* 2017). Halting the infectiousness of MDR-TB is not very hard on correct treatment, patients should be less infectious within two weeks of starting treatment (Kigozi *et al.* 2017). Without correct and consistent treatment, however, each infectious person can infect as many as 10 to 15 other people who can infect still more individuals (Daku and Gibbs, 2012). This is why we need for early diagnosis, treatment initiation and supporting adherence to treatment for halting new infections. For treatment to be effective, patients must be initiated on correct medications within two days of diagnosis and sustain such treatment for the prescribed period (Daku and Gibbs 2012; Kigozi *et al.* 2017)

To treat MDR TB diseases, at least 5 drugs should be used in the intensive phase of treatment, and at least 4 drugs should be used in the continuation phase. The intensive phase of

treatment should last 5 to 7 months after culture conversion, and the total duration of treatment (i.e., intensive and continuation phases combined) should last 15 to 21 months after culture conversion. The final treatment duration will depend on the clinical context, extent of disease, response to treatment, and other factors (WHO, 2021).

Table 9:Clinical Strategy to Build an Individualized Treatment Regimen for MDR TB

Instruction	Drugs
Step1; choose one later-generation fluoroquinolone	• Levofloxacin • Moxifloxacin
Step 2; choose both of these prioritized drugs	• Bedaquiline • Linezolid
Step 3; choose both of these prioritized drugs	• Clofazimine • Cycloserine/terizidone
Step 4; if a regimen cannot be assembled with 5 effective oral drugs and the isolate is susceptible, use one of these injectable agents	• Amikacin • Streptomycin
Step 5; If needed or if oral agents preferred over injectable agents in step 4, use the following drugs	• Delamanid • Pyrazinamide • Ethambutol
Step 6; if limited options and cannot assemble a regimen of five effective drugs, consider use of the following drugs	• Ethambutol or prothionamide • Imipenem-cilastatin/clavulanate or meropenem/clavulanate • p-Amino salicylic acid • High-dose isoniazid
The following drugs are not recommended for inclusion in MDR-TB regimens**;**	• Capreomycin and kanamycin • Amoxicillin/clavulanate (when used without a carbapenem) • Azithromycin and clarithromycin

2.2. TB in Ethiopia

In Ethiopia the disease kills19,000 people every year more than HIV and malaria combined. (WHO 2023). Ethiopia is the 2nd populous country in Africa, is consistently ranked among the top countries in the world in terms of the number of new TB cases reported annually highly affected by tuberculosis (TB). The estimated TB incidence in Ethiopia was 143,000, and an estimated 21,000 people died from TB. Globally the annual estimates of 1.2 million deaths from TB were reported in 2018, of which Ethiopia accounts for an estimated death rate of 22 per100, 000 population (WHO, 2019).

According to the 2023, Ethiopian Public Health Institute report, 104,606 TB case notification ,and 51 percent of total notified individuals with bacteriologically confirmed pulmonary TB were tested for rifampicin resistance (RR-TB).Ethiopia has reduced its TB incidence in approximately 34% since 2015,however it continues to have a total TB incidence of 126 cases per 100,000 inhabitants .(WHO global TB report ,2023) This might be the fact that considering TB is one of the major public health challenges for the country, the Federal Ministry of Health had given due attention and included TB prevention and control among major priority programs (Ministry of Health of Ethiopia, 210). Directly observed treatment short-course (DOTS) is one of them and was adopted from the WHO with the aim to achieve a 70% case detection rate and 85% treatment success rate. The internationally recommended DOTS strategy for TB control has been recognized as a highly efficient and cost-effective strategy. It comprises five components namely; sustained political and financial commitment, diagnosis by quality ensured sputum-smear microscopy, standardized short-course anti-TB treatment given under direct and supportive observation, a regular, uninterrupted supply of high-quality anti-TB drugs and standardized recording and reporting (Ministry of Health of Ethiopia, 2014).According to the Federal Ministry of Health assessment in 2013/2014, DOTS program physical coverage reached 98.4% in hospitals and 79% in health centers in the country.

Although great efforts are done by different stakeholders; according to the Institute for Health Metrics and Evaluation for Ethiopia (2019), TB is still the 4th most common cause of death. In line with this, in Addis Ababa, of the total 9905 deaths for which the causes were assigned, the proportionate mortality ratio of TB was 6% and higher among males (6.8%) than females (5.1%) (Ethiopian Public Health Institute, 2017).

Despite the implementation of DOTS program, different reports across the country have indicated the existence of challenges in improving TB treatment outcomes. The challenges emanated from differences in treatment-seeking behavior, poor compliance, presence of co-infection, variations in experts' qualification, and presence of drug resistance (Mohammed *et al.*, 2017).

2.3. KNOWLEDGE, ATTITUDE AND PRACTICE/ KAP/REGARDING *Mycobacterium tuberculosis* /TB/

Knowledge is seen as acquiring, retaining and using of information (Wan, Rav-Marathe & Marathe, 2016). However, the process of acquiring knowledge is not limited to a formal

education setting but experience and a person's environment play essential roles in acquiring knowledge. Nevertheless, lack of knowledge may have a negative impact on health and survival. For instance, a person's lack of knowledge related to TB may result in delays in seeking treatment until symptoms are severe as a result of untreated disease progression.

According to Hoa *et al.* (2003), the lack of TB knowledge limits people's ability to prevent TB spread and early treatment. The Study claimed that knowledge, attitudes and practices played significant roles in adherence to anti-TB treatment, and thus in the prevention of complications and progression of the disease. More *et al.* (2019) is one of the recent studies that evaluated TB behavioral practices among medical students. The study reported a positive TB preventive practice among medical students in India. In the study, 95% of the students agreed to perform hand hygiene and wear a piece of personal protective equipment before they make contact with pulmonary TB patient or TB samples (More *et al.* 2019). Similarly, Behnaz *et al* (2014) reported positive practice of wearing a face mask (70.2%) among medical final year students in Iran.

Factors affecting KAPs are different such as lack of awareness and misunderstanding on the transmission way of TB, this idea studied by different researchers. The evil spirit and sexual intercourse have been found to be incriminated as a cause for TB. Their community also exhibits a great deal of ostracism towards People with TB. "Cold" has been cited as a cause of TB in Ethiopia. Belief in an association between HIV and TB has been found in Zambia and Ethiopia (Gelaw *et al.*, 2001).

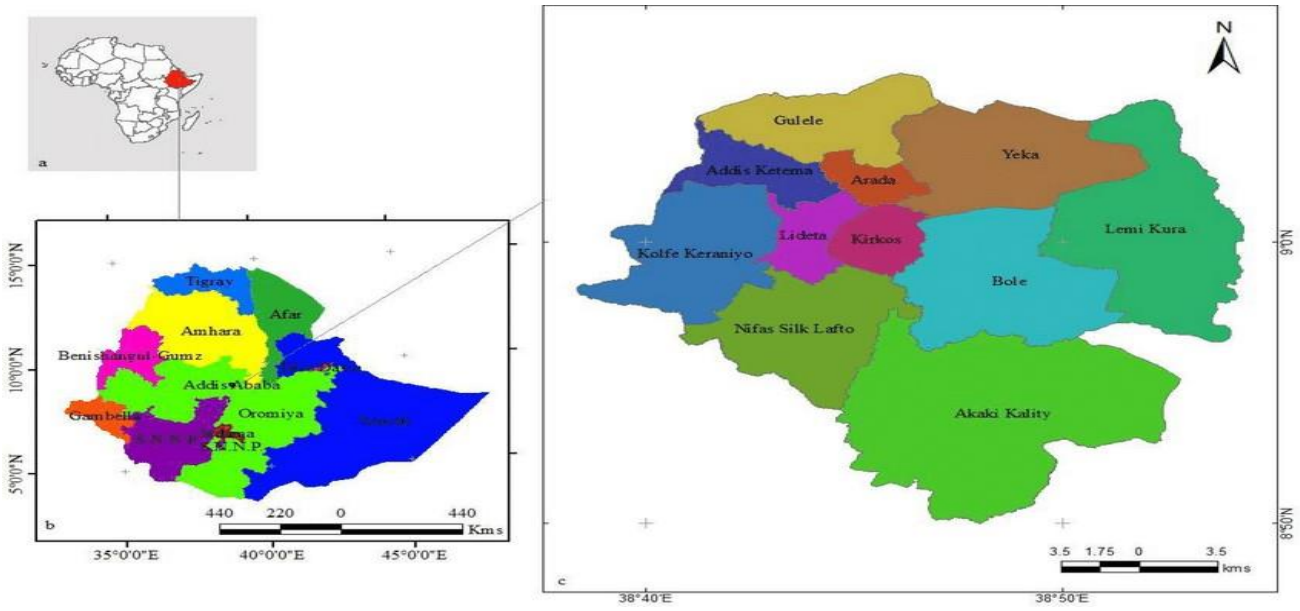
In Ethiopia the proportion of TB with known HIV status is 43% and 15% of those with known HIV status are positive. sixty-nine percent (69%) of TB and HIV co-infected patients have started cotrimoxazole prophylaxis, while 39% are on ART (WHO,2011).

3. Materials and Methods

3.1. Description of the Study area

The study was carried out in Keranio Medhanialm General Secondary School, Addis Ababa. The school is located in Kolfe Keranio sub city, at woreda 08. The district is found in the western suburb of the city, near the Gefersa Reservoir. Kolfe is considered as one of the semi-peripheral parts of the city recognized for informal business activity according to the former administrative structure of Addis Ababa.

The sub city shares borders with the district of Gullele, Addis Ketema, Lideta, and Nefas Silk –Lafto. There are six government high schools in the sub-city. The students come from different areas: some from Betel, Alembank, Anfo, Ashewa meda and others from Torhailoch area.



A B

Figure 5: Map shows the study site, Addis Ababa Administrative Region, panel A regions of Ethiopia and panel B Administrative map of Addis Ababa, the study conducted at Kolfe Keranio sub city.

3.2 study design and study period

An institutional based cross -sectional study was conducted to asses knowledge, attitude and practice of students towards tuberculosis. The study was conducted in Keranio Medanuialem General Secondary School located in Kolfe Keranio sub city of Addis Ababa.

3.3 population

3.3.1 source of population

All grade 11 and 12 students attending their education in Keranio Medanialem General Secondary School in the academic year of 2015 were considered as source of population**.**

3.3.2 study population

The study population constitutes students selected from grade 11 and grade 12, who were attending their education in Keranio Medanialem General Secondary School in the academic year of 2015.

3.4. Inclusion and exclusion criteria

All grade 11 and grade 12 students who were volunteered to participate in the study after signing the assent and consent forms were included in the study. Others members of the school communities were excluded.

3.5 variables of the study

3.5.1 Dependent variable

The dependent variable in this study was

- ✓ Knowledge about tuberculosis
- ✓ Attitude toward tuberculosis
- ✓ Practice of tuberculosis prevention methods

3.5.2 Independent variables

The independent variables are the socio demographic variables used in this study such as sex, age, educational back ground of the study participants' family.

3.6. Sample Size Determination

The total population of Keranio Medanialem General Secondary School preparatory student was 570 and the sample size was determined using the formula for estimating a single population proportion

Where; ni= $\frac{=1.96x.5(1-.5)}{d^2}$ =

ni=the required sample size

Zα/2 =standard normal value at 95%CI which is 1.96

P= estimated population proportion is 50%

d= margin of error tolerated which is 5%

Accordingly, the sample size was 384. Since our source populations were less than ten thousand sample size adjustment was made using the following formula;

$$NF = \frac{230}{}$$

where; NF=the sample size calculated by adjustment,

ni=the initial sample size calculated by single proportion formula (384)

N= the total number of students 570.

Based on this formula the sample size for this study was 230.

3.7 Sampling Technique

The study is purposively selected preparatory students of Keranio Medanialem General Secondary School. A total of 230 participants were included from grade 11 and 12 by simple random sampling technique

3.8. Data collection procedure

A structured questionnaire adapted and modified from previous studies was used to collect data. (annex I) The questionnaire included variables related to socio-demography, questions about knowledge, attitude and practice of respondents about TB. The original questionnaire was prepared in English and translated to Amharic language to avoid any potential misunderstanding. Before all the questionnaires are being distributed to all respondents, 10

percent of it was distributed as pilot test to check the quality and the necessary modification was made based on the responses.

3.9. Data Analysis

The data were first checked manually for completeness and then coded and entered into SPSS. then, the data were analyzed using SPSS software (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Descriptive statistics such as frequency, percentage, and standard deviations was computed to summarize categorical variables. Binary logistic regression that is, both bivariate and multivariate logistic regression, used to analyze significant independent variable with a value less than 0.25, in bivariate binary logistic regression, further analysis was focused on multivariate logistic regression. P - value less than 0.05 is considered statistically significant.

3.10. Ethical Consideration

Ethical approval for the study was obtained from Ethical review Committee of the College of Natural and Computational Science of Addis Ababa University (annex I). Informed consent and assent were also obtained from the respondent before data collection similarly the respondent was informed about the purpose of the study. The respondents were also informed that all information from them would be kept confidential and it was meant for the purpose of the study. The respondents were also informed that they have the right either to involve or not in the study.

3.11. Operational Definition

- **Knowledge:** It is information that an individual is aware of. In this study it was measured based on the ability of students correctly identify and respond to TB cause, mode of transmission and factors related to transmission, sign & symptoms, possible ways of prevention of tuberculosis and treatment.
- **Attitude:** is the perception or outlook regarding tuberculosis. It was measured by respondent's feelings towards the cause, treatment and about the follow up and felling when others knew that he/she had TB.

- **Practice:** is the overt behavior, habit or custom that a person does, follow up or carry out in his/her daily life. It was measured based on previous health seeking behavior, decisions and action taken to seek treatment and advice about TB.

4. RESULTS

4.1. Socio-demographic characteristics

A total of 230 students with a responsive rate of 100% were involved in the study. Among them 92 (40%) were male and 137(59.6%) were female. Most students182 (79.1%) were in the age category of 18-23 years old,147(63.9%) were grade 12 students. Most students came from a father, whose educational background 81 (35.2%) completed elementary school, twenty -one (12.6%) high school completed and mothers with educational background 69 (30%) completed high school ,41 (17.8%) elementary completed, 65(28.3%) can read and write. The occupational status of most of the respondents' father and mother were merchants 81(35.2%) and 53(23%) respectively and their monthly income were 10,000 birrs (45,7%). The number of family members of the respondents six and above were 33%, and four or five family members were 43%. The socio -demographics characteristics of the respondents were shown in Table 10:

Table 10:Socio-demographic characteristics of the study population

NO	Question Items	Alternatives	Frequency	Percentage
1.	Sex	Male	92	40
		Female	138	60
2.	Age	Between 15-17	48	20.9
		Between 18-23	182	79.1
3	Educational level/Grade of respondents	11	83	36.1
		12	147	63.9
4	Educational level of parent/Guardian (Mother)	Can't write & read	36	15.7
		Can write & read	65	28.3
		Elementary complete	41	17.8
		High school complete	69	30
		Diploma	1	0.4
		1st Degree	14	6.1
		2nd Degree	4	1.7
5	Educational level of parent/Guardian (Father)	Can't write & read	21	9.1
		Can write & read	74	32.2
		Elementary complete	81	35.2
		High school complete	29	12.6
		Diploma	3	1.3
		1st Degree	3	1.3
		2nd Degree	19	8.3

6	Occupation of parent/ Guardian (Mother)	Health professional	3	1.3
		Teacher	4	1.7
		Merchant	53	23
		Other	170	73.9
7	Occupation of parent/ Guardian (Father)	Health professional	1	0.4
		Teacher	4	1.7
		Merchant	81	35.2
		Other	144	62.6
8	Number of family members (including yourself)	1-3	53	23
		4-5	99	43
		6 & more	77	33.5
9	Monthly income of the family	<2500 birr	13	5.7
		2500-5000 birr	46	20
		5001-7000 birr	35	15.2
		7,001-10,000 birrs	105	45.7
		>10,001 birr	31	13.5

4.2. Knowledge related characteristics of respondent

Nearly all, i.e., 223 (97%) of the study participants, heard about tuberculosis (Table 11). Among them, 124(53.9%) heard from communication media and 81 (35.2%) from health professionals about the question of the causative agent of TB; fifty-six (24.3%) knew it was bacteria, and ninety-six (41.7%) thought it was a virus. Almost 87% (199) of students did not get training on HIV/AIDS or TB in school health clubs. For the question, who can get TB? two hundred two (87.8%) students replied that anybody can get a TB infection, 16 (7%) replied adults, and 9 (3.9 %) replied I do not know. For the question, does an infected person show symptoms? One hundred fifty -one (65%) students thought infected people always show symptoms, forty -one (17.8%) seem healthy. This is reveled in the next table:

Table 11: Factors associated with knowledge of the study population about the TB infection

No	Question Items	Alternatives	Frequency	Percentage
1.	Have you heard about TB before?	Yes	223	97
		No	7	3
2.	Which is your source of information about TB so far?	Family/Relatives	19	8.3
		Health professionals	81	35.2
		Communication Media	124	53.9
		Mention if any other	4	1.7
3.	Have you trained about HIV/AIDS or TB in school clubs?	Yes	31	13.5
		No	199	86.5
4	Who can get TB?	Children	3	1.3
		Adult	16	7

		Any body	202	87.8
		I don't know	9	3.9
		Other	0	0
5.	TB causing agent	Bacteria	56	24.3
		Virus	96	41.7
		Fungus	7	3
		I don't know	70	30.4
		Other	1	0.4
6	Infected person always shows symptoms.	Always shows symptoms	151	65.7
		Seems healthy	41	17.8
		I don't know	38	16.5
7.	How can TB identified/diagnosed from body?	Sputum examination	109	47.4
		Blood examination	60	26.1
		Physical appearance	8	3.5
		I don't know	53	23
8.	Is TB a serious problem/disease?	Yes	138	60
		No	27	11.7
		I don't know	65	28.3
9.	If your answer to the above question is" yes" give your reason.	Have no cure	29	21
		Is killer disease	100	72.5
		It cannot be treated	9	6.5
10	Is TB transmittable disease?	Yes	146	63.5
		No	11	4.8
		I don't know	73	31.7
11.	Can TB be prevented?	Yes	162	70.4
		No	13	5.7
		I don't know	55	23.9
12	Can TB be cured by taking medicine?	Yes	195	84.8
		No	5	2.2
		I don't know	30	13
13.	Is there a vaccine for TB?	Yes	133	57.8
		No	18	7.8
		I don't know	79	34.3
14	Do you get any information about TB from schools?	Yes	78	33.9
		No	37	16.1
		I don't know	114	49.5
15.	Do you want to get education about TB in the future?	Yes	179	77.8
		No	51	22.2
16.	How do you prefer information related TB to be presented in the future?	Song	12	5.2
		Drama	119	51.7
		Lecture	17	7.4
		Discussion	10	4.3
		Leaflet and poster	2	0.9
		Social media	70	30.4
17.	Which symptom can be seen in TB patients?	Persistent cough	130	44.7
		Fever	24	8.3
		Weight loses	72	24.8

		Sweating during the night	21	7.2
		Pain around the chest	19	6.6
		Other	25	8.6
18	Have any family member become TB patient before?	Yes	21	9.1
		No	154	67
		I don't know	55	23.9
19	Have you ever caught TB before?	Yes	4	1.7
		No	226	98.3

4. 3. Knowledge about TB transmission

The majority of respondents, that is 156 (66.8%) do not know whether mosquito bite transmit TB or not. 17 (7.4%) respondents said that people can get TB from sharing toilet seats. Twenty -seven (11.7%) respondents knew that TB can be transmitted by shaking hand with the patient, one hundred twenty-seven (55.2%) believe that coughing and sneezing without covering mouth and nose transmit the disease, hindered fifty-eight (68.7%) think that closing windows in public transport increase the chance of getting TB.

More than half of the study participants, 128 (55%), knew that TB cannot be transmitted through sexual intercourse. hundred fifty- five (67%) thought people with HIV were more likely to develop TB than those who had no HIV. Ninety- seven (42.2%) believed that TB can be transmitted by sharing an unsterile, sharp instrument, and 82 (35.7%) thought transfusion of unscreened or infected blood can transmit TB.

Almost 115(50%) of the respondent replied that people with latent or inactive TB transmitted to a normal person and 93(40%) did not knew either inactive TB transmitted or not. The detail of the transmission response of the study participant is presented in table 12 below;

The responses of the result computed as a value of one for the correct answer and a value of zero for incorrect answer and I don't know responses. The mean score of knowledge of the study participant was 11.3(±3.00SD). Among the study participant and 106(46%) of them have good knowledge towards tuberculosis but 123(53%) of the study participant have poor knowledge towards tuberculosis. more details are in table 12.

Table 12: Knowledge about TB transmission

NO	Questions	Alternatives	Frequency	Percentage
1.	Can people get TB from mosquito bite?	Yes	35	15.2
		No	39	17
		I don't know	156	66.8
2	Can people get TB from sharing toilet?	Yes	17	7.4
		No	170	73.9
		I don't know	43	18.7
3.	Closing windows in public transport increase the risk of TB transmission?	Yes	158	68.7
		NO	52	22.6
		I don't know	18	7.8
4.	Can a person get TB by sharing meal with someone who is infected with TB?	Yes	41	17.8
		No	139	60.4
		I don't know	50	21.7
5.	Can TB be transmitted by shaking hand with the patient?	Yes	27	11.7
		No	153	66.6
		I don't know	50	21.7
6.	Can TB be transmitted by coughing and sneezing without covering mouth and nose?	Yes	127	55.2
		No	31	13.5
		I don't know	72	31.3
7.	Can TB be transmitted by transfusion of infected or unscreened blood?	Yes	82	35.7
		No	46	20
		I don't know	102	44.3
8.	Can TB be transmitted by sharing unsterile sharp instruments?	Yes	97	42.2
		No	57	24.8
		I don't know	76	33
9	Can TB be transmitted through sexual intercourse?	Yes	25	10.9
		No	128	55.7
		I don't know	77	33.4
10	Are people with HIV more likely to develop TB more than people who have no HIV?	Yes	154	67
		No	10	4.3
		I don't know	66	28.7
11.	If people have latent/inactive TB, can they transmit to a normal person?	Yes	115	50
		No	22	9.6
		I don't know	93	40.4

Additionally grade 12 and grade 11 students have almost the same awareness about the transmission of TB, as shown (Figure 6). When we compare the knowledge of male with female students, the result shows that female students had better knowledge than males (Figure 7).

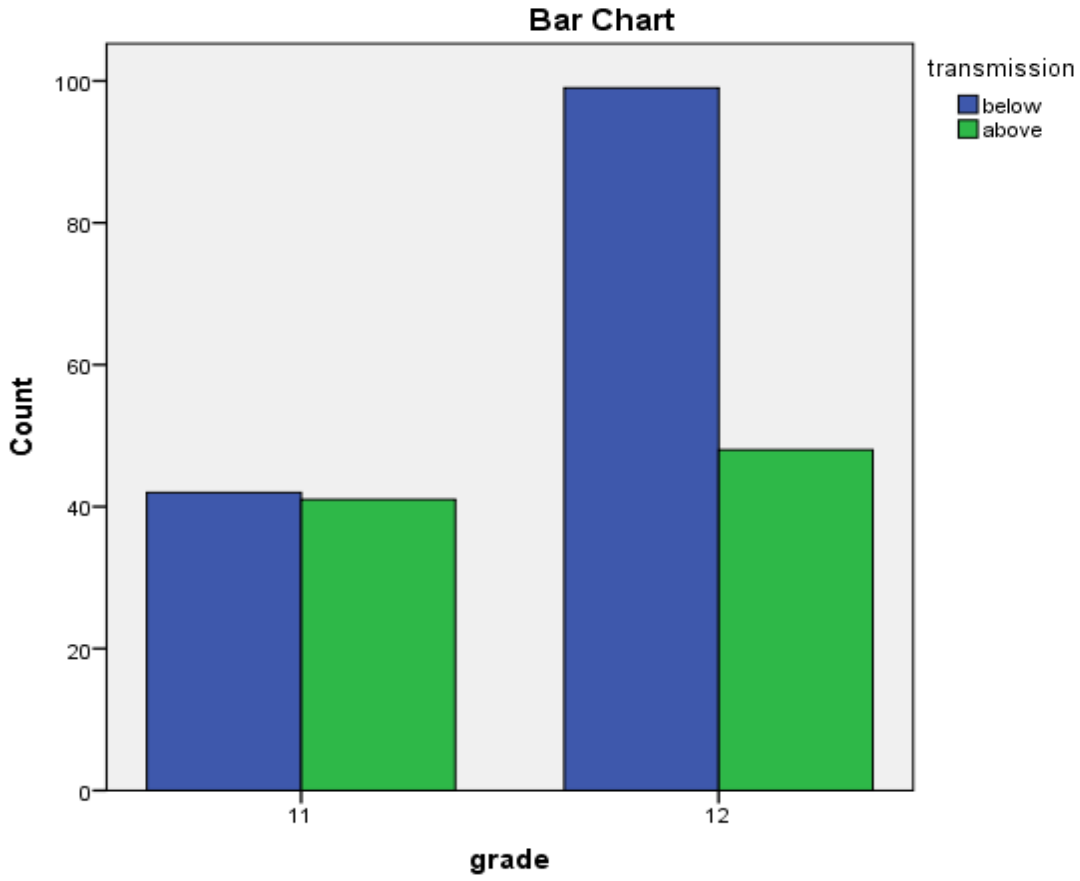


Figure 6: knowledge of respondents based on their grade levels

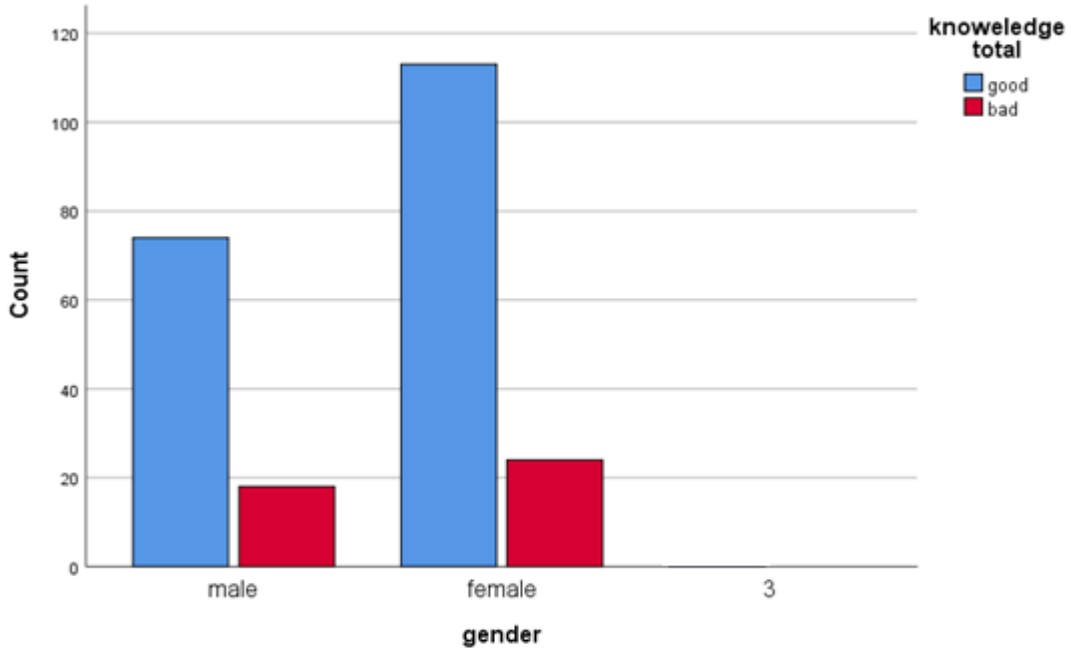


Figure 7: knowledge of respondent to according to their gender.

4.4. Practice to prevent TB

One hundred fifty-seven participants (68.2%) responded opening windows in public transport reduces the risk of transmission of TB. One hundred thirty-eight respondents (60%) responded avoiding sharing toilet seat do not help to prevent TB. 187 respondents (81.3%) replied avoiding public gathering/overcrowding help to prevent TB. Forty -four participants (19.2%) thought that avoiding meal with TB patients prevent TB transmission. For the question can vaccine reduce the risk of getting TB? Hundred seventy-two (74.8%) responded that vaccine reduce the risk of getting TB and above 50% believe that wearing face mask reduce TB transmission, (Table 13).

Table 13: knowledge of participant about TB prevention

c	Questions	Alternatives	Frequency	Percentage
1.	People prevent TB by avoiding mosquito bite?	Yes	68	29.6
		No	45	19.6
		I don't know	117	50.8
2	Can you avoid eating meal with TB patients?	Yes	44	19.2
		No	93	40.4
		I don't know	93	40.4
3.	Does opening windows in public transport and class reduces the risk of transmission of TB?	Yes	157	68.2
		NO	62	27
		I don't know	11	4.8
4.	Can avoiding sharing toilet help to prevent TB?	Yes	41	17.8
		No	138	60
		I don't know	51	22.2
5.	Can avoiding public swimming help to prevent TB?	Yes	44	19.1
		No	101	43.9
		I don't know	85	37
6.	Can avoiding public gathering/overcrowding help to prevent TB?	Yes	187	81.3
		No	14	6.1
		I don't know	29	12.6
7.	Can we prevent by avoiding sneezing and coughing in public gathering without covering mouth and nose?	Yes	139	60.4
		No	74	32.2
		I don't know	17	7.3
8.	Can TB be prevented by using condom?	Yes	28	12.2

		No	93	40.4
		I don't know	109	47.4
9	Can TB be prevented by avoiding sharing unsterile sharp instruments?	Yes	73	31.7
		No	103	44.8
		I don't know	54	23.5
10	Can you prevent TB by avoiding transfusion of unscreened blood?	Yes	134	58.3
		No	37	16.1
		I don't know	59	25.7
11.	Can vaccine reduce the risk of getting TB?	Yes	172	74.8
		No	26	11.3
		I don't know	32	13.9
12	Can TB be prevented by wearing facemask?	Yes	134	58.3
		No	37	16.1
		I don't know	59	

The mean score of the study participant for the practice was 6.08 (±2.2 SD). Of the study participant 97(42.2%), whose mean score from the practice question are greater than or equal to mean score, have good practice towards TB prevention. And 133(57.8%) of the study participants have poor practice level towards TB prevention.

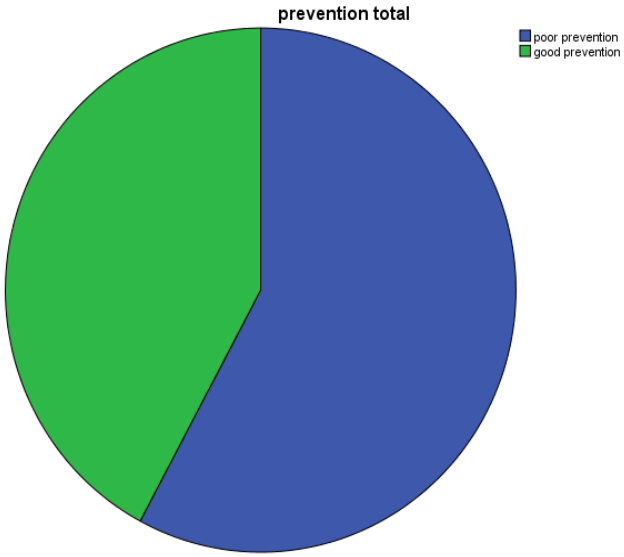


Figure 8: practice level of the study participants in Keranio Medanialm, Addis Ababa, Ethiopia

4.5. Attitude related characteristic of respondent

The majority, 157 (68.3%) respondents, did not get ashamed if they had TB; hundred fifty-eight respondents (68.7%) did not think TB would be resolved without medication; and 50 (21.7%) thought that TB medication would not have a significant effect on health and 166 (72.2%) respondents advise a person on medication to use the medicine persistently and completely. Almost 55% did not think that the life of a person with TB was endangered; one hundred forty -eight respondents (64%) thought that TB can be fully cured by drugs if they are taken properly according to the prescription of the medical worker (Table 14).

Table 14: Attitude related characteristic of respondent

NO	QUESTION	Alternatives	Frequency	Percentage
1.	Do you get ashamed if you have TB?	Yes	53	23
		No	157	68.3
		I don't know	20	8.7
2	Does TB medication causes significant health problem?	Yes	53	23
		No	50	21.7
		I don't know	127	55.2
3.	Do you advice a person on medication to use persistently and complete?	Yes	166	72.2
		NO	53	23
		I don't know	11	4.8
4.	Do you advice others to improve their knowledge about TB?	Yes	134	58.3
		No	82	35.7
		I don't know	14	6.1
5.	Do you think people get TB because they have bad luck?	Yes	32	13.9
		No	120	52.2
		I don't know	78	33.9
6.	Do you have a habit of discussion about TB with your friends?	Yes	92	40
		No	113	49.1
		I don't know	25	10.9
7.	Do you associate TB case with HIV and stigmatize?	Yes	18	7.8
		No	155	67.4
		I don't know	57	24.8

8.	Do you think TB can be resolved without medication?	Yes	50	21.7
		No	158	68.7
		I don't know	22	9.6
9	Do you think the life of a person with TB is endangered?	Yes	75	32.6
		No	126	54.8
		I don't know	28	12.2
10	TB can be fully cured if drugs are taken properly according to the prescription of the medical worker?	Yes	148	64.3
		No	33	14.3
		I don't know	49	21.3

Regarding attitude level of the study participant a total of 10 questions were included in the questionnaire. The responses of the result computed as a value of one for the correct answer and a value of zero for incorrect answer and I don't know responses The mean score of attitudes was 5 (±1.66 SD). Based on this, the overall attitude of the respondent categorized into positive attitude that fall above the mean and negative attitude that fall below the mean. sixty-eight (29.6%) of the respondents have positive attitude towards TB, On the other hand,162(70.4%) of the study participant have negative attitude towards TB.

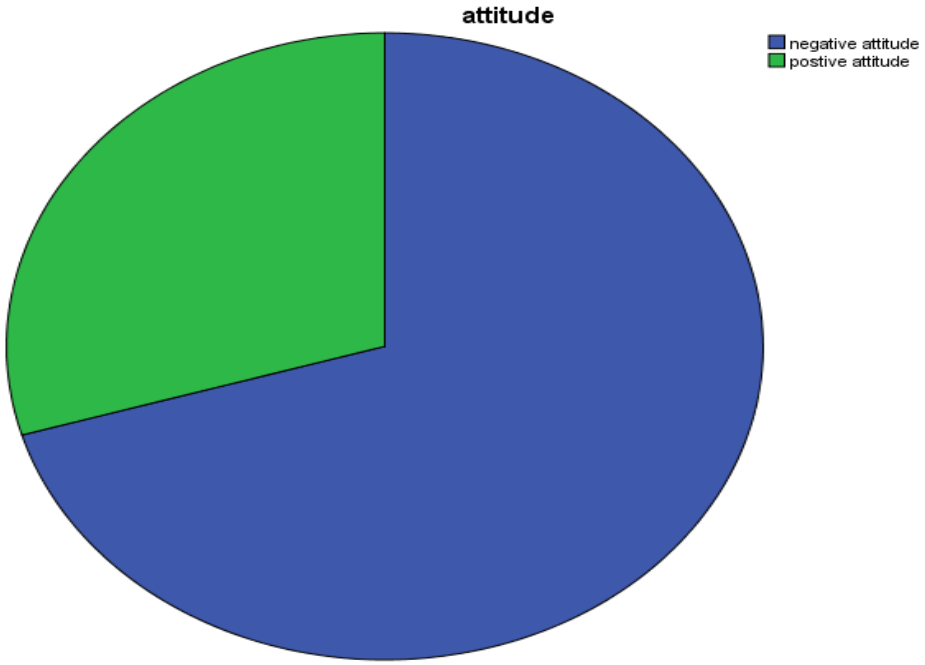


Figure 9: Attitude level of the study participant in Keranio Medanialem .Addis Ababa ,Ethiopia

4.6 Factors associated with TB knowledge and attitude

Important covariates which were independently associated with the knowledge level of the study participant such as age, sex, educational level of the respondent ,educational level of parents/guardian ,occupation of parents ,number of family members ,monthly income of the family, history of TB in the family were identified by bivariate analysis and P-value less than 0.25 were selected for multivariate logistic regression .This was to predict the probability of the a dependent variable based on multiple independent variables .Based on the analysis demographic factor age, gender, grade, mothers work, fathers education ,history of TB in the family had an association with their knowledge level **.**The multivariate binary logistic regression analysis results were depicted in table 15

The result of multivariate regression analysis revealed that educational status of the study participant is not significantly associated with knowledge level of the respondent, both grade 11 and 12 respondents almost have the same knowledge level. But a significant association was observed between gender and knowledge levels about TB with P value 0.013[AOR=2.21(95%CI= (1.181-4.170) female respondents have two times more knowledge level than male respondent.

Table 15: Bivariate and multivariate analysis of factors associated with knowledge level of the study participant towards TB transmission and over all aspect in Keranio Medanialem, Addis Ababa, Ethiopia

Variables		Knowledge level		p-value	AOR	CI
		Good knowledge	Poor knowledge			
Grade	11	52	31			
	12	54	92	.335	1.395	0,709-2.741
Gender	Male	59	33			
	Female	47	90	.013*	2.219	1.181-4.170
Age	15-17	31	17			
	18-23	75	106	.316	1.516	.672-3.419
Mother work	Health professional	1	2			
	Teacher	3	1			
	Merchant	38	15	.049	1.759	1.002-3.087
	Other	64	105			
Number of family	1-3	7	46	.155	.731	
	4-5	62	37			
	6 and more	37	39			.475-1.126
Have TB on the Family before?	Yes	8	13	.022*	2.078	
	No	94	60			
	I don't know	4	50			1.109-3.892

*variable significantly associated with the outcome variable

As shown in the table 16 below, gender of the study participant have no significant association with attitude level of the study respondent .But age of the respondent of the study shows statically significant association with attitude level of the study participant towards tuberculosis with p-value of 0.07[AOR =2.25(95%CI=0.398-3.13)].respondents who were in age category 18-23 have two times more likely positive attitude toward tuberculosis disease when compared with age category 15-17 years old .

Statistically significance association was also observed between knowledge level of the study respondent and their attitude level. Students who have good knowledge level towards the disease are more than two time (2.16) likely to have positive attitude level with P-value 0.030 [AOR =2.16, (95%CI= 1.078 - 4.357)]. History of TB in the family also have association with positive attitude with P value .000[AOR =.009 (95%CI=.001-.0057)

Table 16:Bivariate and multi variate logistic regression analysis of factors associated with attitude level

Variables		Attitude level		P-value	AOR	CI
		Positive	Negative			
Gender	Male	29	63		1	
	Female	39	99	.867	1.083	0.425-2.757
Age	15-17	16	32		1	
	18-23	52	130	.007	2.245	0.398-3.891
Grade	11	26	57		1	
	12	42	105	.633	1.272	0.474-3.415
Mothers' education	Can't write and read	15	21	.424	1	
	Can write and read	18	47	.048	.248	.062-.988
	Elementary completed	22	19	.909	.919	0.217-3.896
	High school completed	10	59	.485	.572	.119-2.743
	Diploma	1	0	1.000		
	First degree	0	14	.998	.000	
	Second degree	2	2	.586	.348	.008-15.530
Fathers' education	Can't write and read	6	15	.058	1	
	Can write and read	16	58	.317	2.295	0.451-11.663
	Elementary completed	34	47	.206	2.766	0.572-13.365
	High school completed	6	23	.665	.650	0.92-4.577
	Diploma	2	1	.014	253.466	

	First degree	2	1	.175	25.040	
	Second degree	2	17	.991	1.016	0.065-15.821
Occupation of parent /guardian (mother)	Health professional			.506	1	
	Teacher			.158	45.185	
	Merchant			.335	10.814	
	Other			.280	13.972	
Occupation of parent /guardian (father)	Health professional	0	1	.846	1	
	Teacher	3	1	1.000		
	Merchant	23	58	1.000		
	Other	42	102	1.000		
Number of family	1-3	6	47	.434	1	
	4-5	34	65	.939	.939	0.185-4.763
	6 and more	28	49	.506	1.673	.367-7.626
Monthly income of the family	<2500 birr	7	6	.703	1	
	2500-5000 birr	32	14	.581	.654	.144-2.966
	5001-7000 birr	18	17	.841	.841	.154-4.582
	7001-10,000 birr	82	23	.994	.994	.206-4.802
	>10,001 birr	23	8	.272	.388	.071-2.104
Have TB on the family before	Yes	17	4	.000	1	
	No	49	105	.000	.069	.018-.259
	I don't know	2	162	.000	.009	.001-.057
Caught by TB before	Yes	2	2		1	
	No	66	160	.329	3.307	.299-36.5
Knowledge of TB	Poor knowledge	25	98		1	
	Good knowledge	43	63	.030	2.168	1.078-4.357

5. DISCUSSION

This study provides important information regarding students' knowledge, attitude and practice about tuberculosis and its associated factors. The genders of respondents were 92 male which was 40.4% and 137 female which was 59.6 %. This shows the gender distribution of respondents were mostly female in this study. The largest group of the respondent was between 18-23 years old which is 79% of the total respondents and almost 63% were grade 12 students. Most of the respondents came from a family (mother) who completed high school (30%) and primary school completed father (35.2%). The average monthly income of the family is birr 7000-10,000 (45%) and have 4-5 family members (43%).

Among 230 respondents almost 97% of the respondents heard about TB. The primary sources of information or communication media are radio and TV which is 95.5%. This is congruent with other similar studies conducted in Yergacheffe high school (Hibistu and Bago, 2016). There was school health club which is working in infectious diseases but according to this study, only 13.5% had received training about TB from the school health club. So, this indicates that further work is needed in school health clubs. Respondents who responded anybody was at risk of getting the disease was 87.8%, this also agrees with the study performed in Yergacheffe high school by Hibistu and Bago (2016) .

In this study most respondents did not correctly mention the causative agent of TB. That means 41.7% thought it is caused by a virus, 30.4% responded that they did not know the cause, and only 24.3% knew that it is bacteria. This result is in line with study done by sewent (2021), but contradicts with other results of studies done in India (77%) and Yergacheffe high school (81.7%) (Hibistu and Bago, 2016).

In this study ,65.7% of respondent incorrectly believed that individuals with tuberculosis (TB) infection always exhibit symptoms. This misconception is consistent with previous studies conducted in Addis Ababa, where a significant portion of the population is unaware that TB bacteria can remain dormant or inactive in the body without causing noticeable symptom, yet still pose a risk of transmission

This study reveals that there is a knowledge gap about TB diagnosis and identification. while sputum examination remains the most widely recognized method 47.4% of respondents answered by sputum examination, substantial proportion(23%) of participant were un aware of this and 26% believed blood examination to be primary diagnostic tool .These findings highlight the need for improved public health education campaigns to disseminate accurate

information about TB diagnosis and treatment .60% of respondent's belief that TB is a serious disease while 11.7% answered it is not a very serious disease, 28.3% do not know. This is also in line with other researches done in Iran 67.7% (Behnaz et al,2014) and Somaliland 30.4% (Kinsi and Nimao.2019) About the reason for the seriousness of TB disease 21% of the respondents thought TB had no cure ,72% because it is a killer disease and 6% thought it cannot be treated.

About the transmission of TB, almost 63% identified TB as a transmittable disease and 32% expressed uncertainty, this indicates a need for improved public awareness. Concerning the prevention of TB, 70.4% were aware of the possibility of preventing TB, and smaller (5.7 %) believe TB can't be prevented, and 23.9% of respondent uncertain. About the curability 84.8% responded correctly recognized that TB can be cured with medication, but 2% believed TB was incurable, and 13% were uncertain. For the question -have you got information about TB from schools, 33% said yes ,16% said no and 49.5% do not know whether they got information from schools or not. Almost 50 % of the students do not know whether they got information about TB from schools. In addition to this, about the need for education on TB in the future, 77.8 % replied Yes ,22.2% replied No. About the way the Respondents want the information related to TB to be presented, 5% by music, 51.7% by drama, 7.4% by lecture, 4.3% by discussion, 0.9% by leaflet and poster, and 30.4% by social media. This shows that respondents preferred to get information on TB in the future more by drama and social media.

This study found that 60.4% of participants, practiced covering their mouth and nose when coughing or sneezing in public gatherings. While this is an effective method for preventing the transmission of tuberculosis (TB), However, this is lower than similar study conducted at Taif university which was 80% (Mohammed et al,2023). Practice of wearing face mask was 58.3%. similarly the avoidance of overcrowding place was 81.3%,this suggest a good level of awareness among respondents .Regarding the belief in the effectiveness of opening windows in public transport and in a class to reduce the chance of getting TB was 68.3% .This is also almost similar in study done in Taif university which was 71.6% (Mohammed *et al*, 2023), but it is lower than the study in Yirgacheffe high school in which, 91.5% responded that they open windows to allow fresh air to enter and ventilate (Hibistu and Bago, 2016).

From the study findings, 74% know the role of vaccine to fight TB. This is better when we compare this with that of the study in kuyyu hospital which is only 42.6% of the respondents

know vaccine plays a role for TB (Maseresha *et al,* 2019). This difference may be due to awareness that has been increased on TB in keranio Medanialem General secondary school students or attention given by ndividuals for vaccine.

Even if TB is one of the communicable diseases that attack many people, majority of the respondents (98.3%) did not catch by TB before but only 9% reported that a family member had history suffered from TB.

Knowledge about TB transmission

This study revealed that there is lack of knowledge about TB transmission among a significance portion of the population. That is 61.3% have poor knowledge of TB transmission, 38.7% have good knowledge of TB transmission. therefore, it is important to educate students especially among those who are unsure**.** there was misconception on mosquito bite, sexual intercourse, sharing of unsterile sharp instruments, transfusion of blood can transmit TB or not, most of the respondents replied 'I do not know' therefore further education on transmission ways needed. Regarding the transmission 55%ofthe respondent recognize TB can be transmitted by coughing and sneezing,

In this study 68% of the respondent have a practice to open windows in public transport and in class to minimize the chance of getting TB but it is lower than studies in yirgacheffe high school students 91.5%) responded that they open windows to allow fresh air to enter (Hibistu and Bago, 2016).

TB is the most opportunistic infection that affect people living with HIV and cause of mortality. It is about 21-34 times more likely to develop TB disease compared with those who are HIV negative (Gelaw *et al,* 2001). In this study 67% of the respondent thought people with HIV virus had more chance of getting TB than people who are HIV negative, but only 4.3 % replied the chance are the same, 28.7 % do not know .so the result show there is more chance of getting TB, if people have HIV viruses. Even if people with latent TB infection is not infectious and can't spread TB to others, in this study 50% of respondents thought that a person with inactive TB/ latent TB transmit the disease.

In this study, 68.3 % reported no shame if they had TB, while 23% felt ashamed and 8% unsure. Regarding TB medication ,23% believed it caused significant health problem,21% saw no significant issues and 55% were uncertain. Additionally, almost 50% of respondent had no habit of discussing TB, compared to 40% who did.

6. Conclusion and recommendation

6.1 Conclusion

Tuberculosis has been recognized as a major public health problem worldwide. Considering the impact, WHO initiated different strategies and campaign to end TB. Based on the KAP assessment, most students are unaware of the causative agent of TB. The finding of this study revealed that while the majority of participant got information regarding the disease, their practical knowledge, attitude, and practice were not comparable to the information they received. So, there is a need for education which can bring a significant change in attitude and life skill development. There is a gap even in the level of awareness or knowledge about TB in some key areas like the causative agent, means of transmission. So, based on the findings of the study therefore it is possible to concluded that there is a significant need for effective TB education.

6.2 recommendation

- There should be a collaborative effort towards ending TB among different stakeholders including the school community.

- TB related health educations have to make sure that the education brings not only change on the knowledge wise, but also attitudinal change.

- Education on TB needs to be delivered to the youth based on their choice of medium of communication. This is because students prefer more of social media to Tv and Radio.

- strengthening health clubs in related to disease transmission and control in schools is essential to campaign end TB in 2030.

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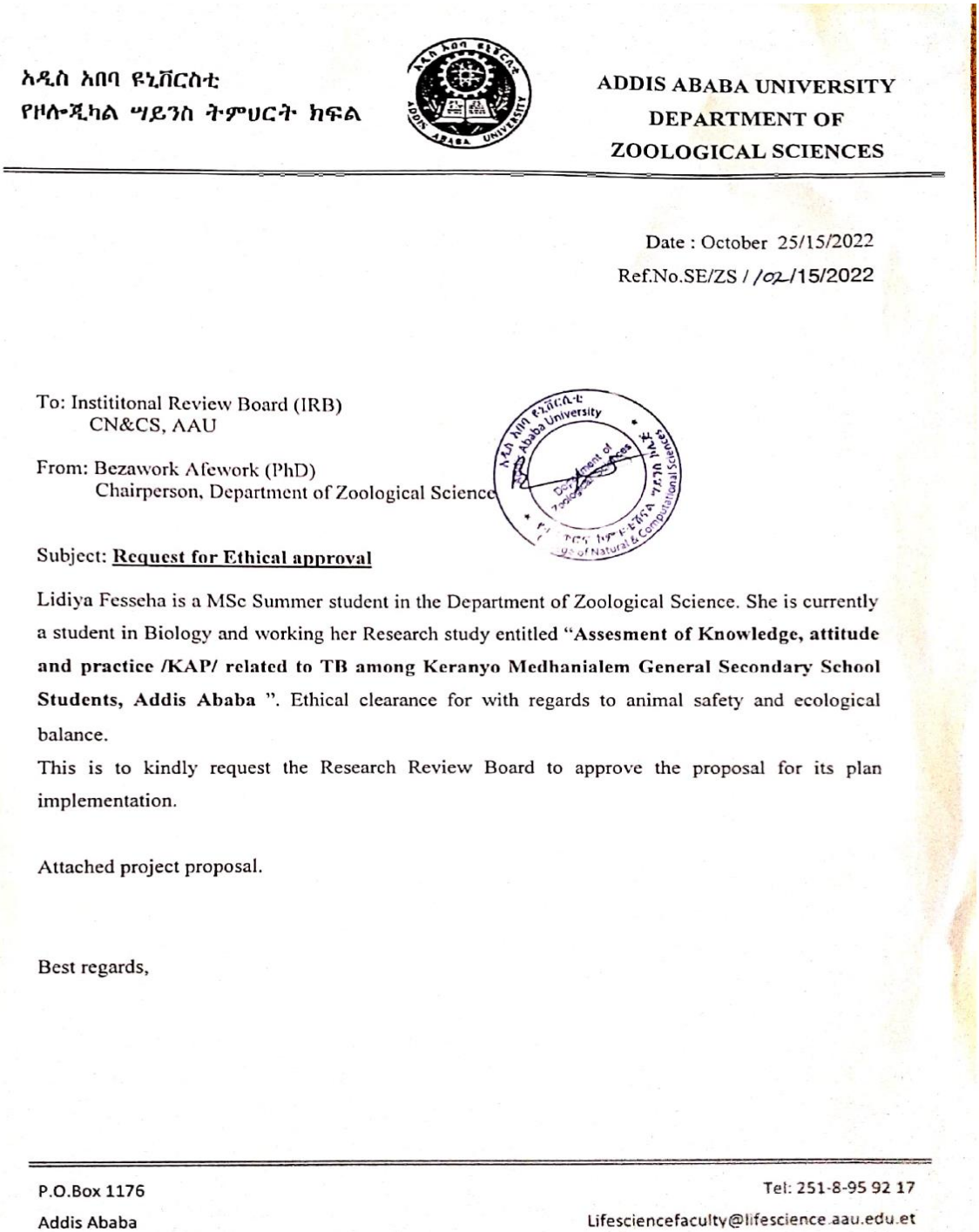
APPENENDECES

APPENDIX 1:



አዲስ አበባ ዩኒቨርስቲ
የዞሎጂካል ሣይንስ ትምህርት ክፍል

ADDIS ABABA UNIVERSITY
DEPARTMENT OF
ZOOLOGICAL SCIENCES

Date : October 25/15/2022
Ref.No.SE/ZS / /02/15/2022

To: Instititonal Review Board (IRB)
CN&CS, AAU

From: Bezawork Afework (PhD)
Chairperson, Department of Zoological Science

Subject: **Request for Ethical approval**

Lidiya Fesseha is a MSc Summer student in the Department of Zoological Science. She is currently a student in Biology and working her Research study entitled "**Assesment of Knowledge, attitude and practice /KAP/ related to TB among Keranyo Medhanialem General Secondary School Students, Addis Ababa** ". Ethical clearance for with regards to animal safety and ecological balance.

This is to kindly request the Research Review Board to approve the proposal for its plan implementation.

Attached project proposal.

Best regards,

P.O.Box 1176
Addis Ababa

Tel: 251-8-95 92 17
Lifesciencefaculty@lifescience.aau.edu.et

APPENDIX (II)

አዲስአበባዩኒቨርስቲየተፈጥሮሳይንስክፍል

ተማሪዎችንስለቲቪ (TB) በሽታያላቸውንእውቀት፣አመለካከትናተግባራትየሚጠይቅመጠየቅ::

መረጃ

- እሺታችሁንሥላገኘውአመሰግናለሁ::ይህመጠይቅበአዲስአበባዩኒቨርስቲየማስተርስትምህርቴንለማጠናቀቅለምሰራውጥናታዊፅሁፍመረጃነትብቻነው::
- የምትመልሱትንመልሶችለጥናቴትክክለኝነትዋስትናነውእንጂ፣በምትመልሱትመልሶችአትፈረጁም::ይሄንለምንአላችሁብሎማን ምአይጠይቃችሁም::
- በ20 ደቂቃትጨርሳላችሁ::

ክፍል 1 ማህበራዊ ተጽእኖ የሚገልጹ (መልሶቻችሁን ከተሰጡት አማራጮች ዉስጥ አንዱን በማክበብ ግለፁ)

ተቁ	ጥያቄዎች	አማራጮች	መልስ
1	ፆታ	ወንድ	
		ሴት	
2	እድሜሽ/ህ ስንት ነው?	ከ15 እስከ 17	
		ከ18 እስከ 23	
3	ስንተኛ ክፍል ተማሪ ነሽ/ህ	11ኛ	
		12ኛ	
4	የእናትሽ/ህ ትምህርት ደረጃ ?	መንበብና መጻፍ አትችልም	
		ማንበብና መጻፍ ጽችላለች	
		1-8ተኛ ክፍል የተማረች	
		2ተኛ ደረጃ ጨርሳለች	

		ዲፕሎማ አላት	
		የመጀመሪያ ዲግሪ	
		2ተኛ ዲግሪ	
5	የእናትሽ /ህ ስራ	የጤና ባለሙያ	
		መምህር	
		ሌላ	
6	የአባትሽ /ህየትምህርት ደረጃ?	መንበብና መጻፍ አትችልም	
		ማንበብና መጻፍ ጽችላለች	
		1-8ተኛ ክፍል የተማረች	
		2ተኛ ደረጃ ጨርሳለች	
		ዲፕሎማ አላት	
		የመጀመሪያ ዲግሪ	
		2ተኛ ዲግሪ	

7	የአባትሽ/ህ ስራ	1. የጤና ባለሙያ	
		2. መምህር	
		3. ሌላ	
8	የቤተሰባችሁ ብዛት ስንት ይሆናል?	1-3	
		4-5	
		6 ወይም ከዚያ በላይ	
9	የቤተሰቦችሽ/ህ የወር ገቢ በግምት ስንት ይሆናል?	1000 በታች	
		1001-2000	
		2001-3000	
		3001-5000	
		ከ5000 በላይ	

ክፍል2 - ሥለ TB በሽታ ተማሪዎች ያላቸው ዕውቀት

ተቁ	ጥያቄዎች	አማራጮች	መልስ
1	ቲቢ (የሳንባ ነቀርሳ)ስለሚባል በሽታ ሰምተሽ/ህ ታውቂያለሽ/ህ	አዎን	
		ሰምቺ አላውቅም	
2	ስለ ቲቢ(ሳንባነቀርሳ) መረጃ ከየት ስምተሽ /ህ ታውቂያለሽ/ህ	ከጋደቼ	
		ከጤና ባለሙያ	
		ከብዙሀን መገናኛ	
		ከቴሌቪዠ/ከራዲዮ	
3	በተለያዩ የት/ቤት ክበባት ስልጠናዎች ላይ ስለቲቢ እና HIV/AIDS ሰልጥነሻል/ሰልጥነሃል?	አዎ	
		አልሰለጠንኩም	
4	በቲቢ (ሣንባ ነቀርሳ) ማን ሊያዝ ይችላል? (ከአንድ በላይ መመለስ ይቻላል	ህፃናት	
		ትልልቅ ሰዎች	
		ሁሉም ሰው	
		አላውቅም	
		ሌላ(ይጠቀስ)	
5	ቲቢ(ሳንባ ነቀርሳ) በየትኛው የበሽታ አምጪ ጀርም ይመጣል?	ባክቲሪያ	
		ቫይረስ	
		ፈንገስ	
		አላውቅም	
		ሌላ	
6	በቲቢ በሽታ የተያዘ ስው ምልክት ያሳያል ወይስ ጤነኛ ይመስላሉ ?	1 ሁሌም ምልክት ያሳያጤነኛ ይመስላሉ	
		አላዉቅም	
7	የሳንባ ነቀርሳ (የቲቢ በሽታ በምን ምርመራ ሊታወቅ ይችላል?	በአክታ ምርመራ	
		በደም ምርመራ	
		በፊት ገ ታ/አቁም በማየት	

		አላውቅም	
8	የቲቢ(ሳንባ ነቀርሳ) በሽታ ከባድና አስፈሪ በሽታ ነው?	አዎ	
		አይደለም	
		አላውቅም	
9	መልስዎ አዎ ከሆነ ለምን?(ከአንድ በላይ መልስ ሊመልሱ ይችላሉ)	ምክንያቱም መድሀኒት ስላለተገኘለት	
		ምክንያቱም ገዳይ በሽታ ስለሆነ	
		ምክንያቱም ህመምተውን ማከም ስለማይቻል	
10	የቲቢ (ሳንባ ነቀርሳ) በሽታ ተላላፊ በሽታ ነው?	አዎ	
		አይደለም	
		አላውቅም	

10	አሁን ወይንም ከዚህ በፊት ከቤተሰቦችሽ /ህ መካከል የቲቢ(ሳንባ ነቀርሳ) ህመምተኛ አለ?	1. አዎ	
		2. የለም	
		3. አላውቅም	
11	በቲቪ ተይዘው ያውቃሉ ወይ	1. አዎ	
		2. አይ	

11	የቲቢ(ሳንባ ነቀርሳ) በሽታን መከላከል ይቻላል ?	አዎ	
		አይቻልም	
		አላውቅም	
12	የቲቢ(ሳንባ ነቀርሳ)በሽታ መድሀኒት በመውሰድ መዳን ይቻላል?	አዎ	
		አይቻልም	
		አላውቅም	
13	የTB በሽታ ክትባት አለው?	አዎ አለው	
		የለውም	
		አላውቅም	
14	ስለ ቲቢ(የሳንባ ነቀርሳ)መረጃ በትምህርት ቤት ዉስጥ (ወይም በሌላ አጋጣሚ) ተምረህ/ሽ ታውቃለህ/ሽ?	አዎ	
		አልተማርኩም	
		አላውቅም	

15	ስለ ቲቢ (ሳንባ ነቀርሳ)በሽታ ወደፊት መማር ትፈልጋለህ/ ትፈልጊያለሽ ?	አዎ	
		አልፈልግም	
16	ወደፊት ሰለ ቲቢ (ሳንባ ነቀርሳ)መረጃዎች በምን መልኩ ቢቀርቡ ይሻልሀል	ሙዚቃ	
		ድራማ	
		ገለ	
		በውይይት	
		ብሮሸር	
		ፖስተር	
17.	በቲቢ የተያዘ ሰው ምን አይነት ምልክቶችን ሊያሳይ ይችላል	ለረጂም ጊዜ ሳል ማሳል	
		ሰውነት ማተኮስ/ጋበን	
		የክብደት መቀነስ/የሰውነት መክሳት	
		በተለይ ለሊት የሰውነት ማላብ	
		የደረት ውጋት ህመም ስሜት	

ክፍል 3 ሰለ TB በሽታ መተላለፊያ ዘዴዎች እቀት የሚለካ (በመልስ ላይ ምልክት አስቀምጡ)

ተ.ቁ		አማራጮች		
		1 አዎ	2 አይችሉም	3-አላውቅም
1	የወባ ትንኝ ብትነክስ TB በሽታ ታስተላልፋለች			
2	ሽንት ቤት በጋራ በመጠቀም TB በሽታ ያሰተላልፋል			
3	በአውቶቢስ ወይም በሌሎች የጋራ ትራንስፐርት ላይ መስከት መዝጋት ቲቢ በሽታ እንዲተላለፍ እድል ይፈጥራል			
4	የ TB በሽተኛ ከሆነ ሰው ጋር ምግብ መመገብ			
	በሽታውን የስተላልፋል			
5	ከ TB በሽተኛ ጋር መጨባበጥ በሽታው ይተላለፋል			
6	TB በሽታ ማሳልና በማስነተስ ይተላለፋል			
7	TB በሽተኛ ከሆነ ሰው ደም በሽታው ለሌለበት በሰጥ በሽታው ይተላለፋል			
8	ያልተቀቀለ እና ስለታማ ነገሮችን ከTB በሽተኛ ጋር መተቀም በሽታውን ያስተላልፋል			
9	ልቅ የሆነ የግብረ ስጋ ግንኙት TB ይተላለፋል			
10	የኤች አይ ቪ በሽተኞች በ TB የመያዝ እድላቸው ከፍተኛ ነው			
11	የተላመደ TB ጀርም ከአንድ ሰው ወደ ሌላ ሰው ይተላለፋል			

ክፍል 4 እውቀት እና የ TB በሽታ መከላከያ መንገዶች

ተ.ቁ		አማራጮች		
		አዎ	አይችሉም	አላውቅም
1	ሰዎች የTB በሽታን ከወባ ትንኝ ንክሻ እራሳቸውን በመተበቅ መከላከል ይችላሉ			
2	ሰዎች ከTB ህሙማን ጋር በጋራ ባለመመገብ በሽታውን መከላከል ይችላሉ			
3	አውቶቢስ እና የተለያዩ የጋራ ትራንስፖርት መስኮት በመክፋት የTB በሽታን መተላለፍ መጠን መቀነስ ይቻላል			
4	በጋራ መጸዳጃ ቤቶችን ባመጠቀም ቲቢን መከላከል ይቻላል			
5	የጋራ መዋኛ ገንዳዎች ውስጥ ባለመዋኘት የቲቢ በሽታን መከላከል ይቻላል			
6	ብዙ ህዝብ በተሰበሰበበት ቦታ ባለመገኘት ቲቢን መከላከል ይቻላል			
7	ሰዎች በብዛት በተሰበሰቡበት ቦታ ባለመሳል እና ባለማስነጠስ ቲቢን መከላከል ይቻላል			
8	ኮንዶም በመጠቀም ቲቢን መከላከል ይቻላል			
9	ያልተቀቀለ ስለታማ እቃዎችን እንደ ምላጭ መርፌ የመሳሰሉትን በጋራ ባለመጠቀም የቲቢ በሽታ እንዳይተላለፍ ማድረግ ይቻላል			
10	ያልተመረመረ ደም ለሰዎች ባለመለገስ ቲቢን መከላከል ይቻላል			
11	ቲቢ በሽታ ክትባት በሽታው የመያዝ እድልን የቀንሳል			

6	ስለሳንባ ነቀርሳ በሽታ ትወያያላቸው			
7	የሳንባ ነቀርሳ በሽታ ህክምና የሚከታተል ሰውን ከኤድስ በሽታ ጋር በማያያዝ ታገሉታላችሁ			
8	የሳንባ ነቀርሳ በሽታ ያለህክምና ይድናል ብላችሁ ታምናላችሁ			
9	የሳንባ ነቀርሳ ህመምታኛ በከፍተኛ ሁኔታ ህይወቱ አደጋ ላይ ነው ብላህ/ለሽ/ ታስባለህ/ሽ/			
10	የቲቢ በሽታ መድሃኒቶችን በአግባቡ እንደ ሃኪሙ ትዛዘ ከተውሰደ ሙሉ ለሙሉ መዳን ይቻላል			

ክፍል -5 ስለ አመለካከት እና ተግባር

ተ.ቁ		አማራጮች		
		1 አዎ	2.አይችሉም	3.አላውቅም
1	በሳንባ ነቀርሳ በሽታ ብትያዝ /ቹ/ ያሳፍርሻል			
2	የሳንባ ነቀርሳ በሽታ መድሃኒት የጎንዮሽ የጤና ችግር ያመጣል			
3	የሳንባ ነቀርሳ በሽታ መድሃኒት እየወሰዱ ላሉ ህመምተኞች መድሃኒቱን ወስደው እንዲቸጨርሱ ትመክራላችሁ			
4	ሌሎች ስለሳንባ ነቀርሳ እንዲያቁት ታደርጋላችሁ			
5	በመጠፎ እድል የሳንባ ነቀርሳ በሽተኛ ሊኮን ይያላል ብላችሁ ታምናላችሁ			

6	ስለሳንባ ነቀርሳ በሽታ ትወያያላቸው			
7	የሳንባ ነቀርሳ በሽታ ህክምና የሚከታተል ሰውን ከኤድስ በሽታ ጋር በማያያዝ ታገሉታላችሁ			
8	የሳንባ ነቀርሳ በሽታ ያለህክምና ይድናል ብላችሁ ታምናላችሁ			
9	የሳንባ ነቀርሳ ህመምታኛ በከፍተኛ ሁኔታ ህይወቱ አደጋ ላይ ነው ብላህ/ለሽ/ ታስባለህ/ሽ/			
10	የቲቢ በሽታ መድሃኒቶችን በአግባቡ እንደ ሃኪሙ ትዛዘ ከተውሰደ ሙሉ ለሙሉ መዳን ይቻላል			

APPENDIX (II)

ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES DEPARTMENT OF ZOOLOGY

QUESTIONNAIRE TO ASSESS KNOWLEDGE, AND ATTITUDES OF STUDENTSON

TUBERCULOSIS(TB) AT KERANYO MEDHANIALEM GENREAL SECONDARY SCHOOL IN ADDIS ABABA

Information Sheet

Thank you for agreeing to participate in this survey. The survey is being done by Addis Ababa University for partial fulfillment of MSc. research. The purpose of the survey is to collect opinions from general secondary school of Keranio Medhanialem school in Addis Ababa, Ethiopia.

All of the answers you provide in this survey will be kept confidential. No identifying information will be provided to anyone else. The survey data will be reported in a summary fashion only and will not identify any individual person.

This survey will take about 20 minutes to complete.

Questioner; English version

Instruction; choose the appropriate answer of the following questions

Part 1 socio demographic characteristics

NO	Question Items	Alternatives	**Answer**
1.	Sex	Male	
		Female	
2.	Age	Between 15-17	
		Between 18-23	
3	Educational level/Grade of respondents	11	
		12	
4	Educational level of parent/Guardian	Can't write & read	
		Can write & read	

	(Mother)	Elementary complete	
		High school complete	
		Diploma	
		1st Degree	
		2nd Degree	
5	Educational level of parent/Guardian	Can't write & read	
		Can write & read	
	(Father)	Elementary complete	
		High school complete	
		Diploma	
		1st Degree	
		2nd Degree	
6	Occupation of parent/ Guardian (Mother)	Health professional	
		Teacher	
		Merchant	
		Other	
7	Occupation of parent/ Guardian	Health professional	
	(Father)	Teacher	
		Merchant	
		Other	
8	Number of family members (including yourself)	1-3	
		4-5	
		6 & more	
9	Monthly income of the family	<2500 birr	
		2500-5000 birr	
		5001-7000 birr	
		7,001-10,000 birrs	
		>10,001 birr	

Part 2 Questions on knowledge of TB transmission

no	Question	Alternatives	
1	People prevent TB by avoiding mosquito bite?	Yes	
		No	
		I don't know	
2	Can you avoid eating meal with TB patients?	Yes	
		NO	
		I don't know	
3	Does opening windows in public transport and class reduces the risk of transmission of TB?	Yes	
		No	
		I don’t know	
4	Can avoiding sharing toilet help to prevent TB?	Yes	
		No	
		I don’t know	
5	Can avoiding public swimming help to prevent TB?	Yes	
		No	
		I don’t know	
6	Can avoiding public gathering/overcrowding help to prevent TB?	Yes	
		No	
		I don’t know	
7	Can we prevent by avoiding sneezing and coughing in public gathering without covering mouth and nose?	Yes	
		No	
		Idont know	
8	Can TB be prevented by using condom?	Yes	
		No	
		Idont know	
9	Can TB be prevented by avoiding sharing unsterile sharp instruments	Yes	
		No	

		I don’t know	
10	Can you prevent TB by avoiding transfusion of unscreened blood?	Yes	
		No	
		I don’t know	
11	Can vaccine reduce the risk of getting TB	Yes	
		No	
		I don’t know	
12	Can TB be prevented by wearing facemask?	Yes	
		No	
		I don’t know	

Part 3 knoweledge about TB transmission

NO	Questions	Alternatives	Frequency
1.	Can people get TB from mosquito bite?	Yes	
		No	
		I don't know	
2	Can people get TB from sharing toilet?	Yes	
		No	
		I don't know	
3.	Closing windows in public transport increase the risk of TB transmission?	Yes	
		NO	
		I don't know	
4.	Can a person get TB by sharing meal with someone who is infected with TB?	Yes	
		No	
		I don't know	
5.	Can TB be transmitted by shaking hand with the patient?	Yes	
		No	
		I don't know	
6.	Can TB be transmitted by coughing and sneezing without covering mouth and nose?	Yes	
		No	

		I don't know	
7.	Can TB be transmitted by transfusion of infected or unscreened blood?	Yes	
		No	
		I don't know	
8.	Can TB be transmitted by sharing unsterile sharp instruments?	Yes	
		No	
		I don't know	
9	Can TB be transmitted through sexual intercourse?	Yes	
		No	
		I don't know	
10	Are people with HIV more likely to develop TB more than people who have no HIV?	Yes	
		No	
		I don't know	
11.	If people have latent/inactive TB, can they transmit to a normal person?	Yes	
		No	
		I don't know	

Part 4 ;questions on practice to prevent TB

NO	Questions	Alternatives	Frequency
1.	People prevent TB by avoiding mosquito bite?	Yes	
		No	
		I don't know	
2	Will you avoid eating meal with TB patients?	Yes	
		No	
		I don't know	
3.	Opening windows in public transport and class reduces the risk of transmission of TB?	Yes	
		No	
		I don't know	
4.	Can avoiding sharing toilet help to prevent TB?	Yes	
		No	

		I don't know	
5.	Can avoiding public swimming help to prevent TB?	Yes	
		No	
		I don't know	
6.	Can avoiding public gathering/overcrowding help to prevent TB?	Yes	
		No	
		I don't know	
7.	Can we prevent by avoiding sneezing and coughing in public gathering without covering mouth and nose	Yes	
		No	
		I don't know	
8.	Can TB be prevented by using condom?	Yes	
		No	
		I don't know	
9	Can TB be prevented by avoiding sharing unsterile sharp instruments?	Yes	
		No	
		I don't know	
10	Can you prevent TB by avoiding transfusion of unscreened blood?	Yes	
		No	
		I don't know	
11.	Can vaccine reduce the risk of getting TB?	Yes	
		No	
		I don't know	
12	Can TB be prevented by wearing facemask?	Yes	
		No	
		I don't know	

no	Question	Alternatives	
1.	Do you get ashamed if you have TB?	Yes	
		No	
		I don't know	
2	Does TB medication causes significant health problem?	Yes	
		No	
		I don't know	
3.	Do you advice a person on medication to use persistently and complete the medicine?	Yes	
		NO	
		I don't know	
4.	Do you advice others to improve their knowledge about TB?	Yes	
		No	
		I don't know	
5.	Do you think people get TB because they have bad luck?	Yes	
		No	
		I don't know	
6.	Do you have a habit of discussion about TB with your friends?	Yes	
		No	
		I don't know	
7.	Do you associate TB case with HIV and stigmatize?	Yes	
		No	
		I don't know	
8.	Do you think TB can be resolved without medication?	Yes	
		No	
		I don't know	
9	Do you think the life of a person with TB is endangered?	Yes	
		No	
		I don't know	
10	TB can be fully cured if drugs are taken properly according to the prescription of the medical worker?	Yes	
		No	

		I don't know	

Part 5 ;attitude related question

APPENDIX (III)

LETTER OF INFORMED CONSENT

Dear Parent/Guardian/Adult-in-Life

Study Addis Ababa University: Department of Zoological Sciences.

Title of Research Project: ----------

Name of principal investigator: ----------

Phone Number of principal investigator: ----------

We are very excited to inform you that your youth will have the opportunity to participate in the

questioner entitled: KNOWLEDGE, ATTITUDE AND PRACTICE OF

KERANIO MEDHANIALEM GENREAL SECONDARY SCHOOL STUDENTS ABOUT TUBERCULOSIS(TB) IN ADDIS ABABA, which is research for partial fulfillment of MSC.

CONFIDENTIALITY: the records from this study will be kept as confidential as possible. No individual identities will be used in any report or publications resulting from the study.

If you have any questions about the study, please contact Ms. **Lidiya Fiseha by calling (0911784882).** you can also contact school principal: Mr, **Biniam** with any questions about the rights of research **participants or research related concerns.**

CONSENT YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE YOUR YOUTH IN RESEARCH STUDY. YOUR SIGNATURE BELOW INDICATES THAT YOU HAVE DECIDED TO YOUR YOUTH TO PARTICIPATE IN THE STUDY AFTER READING ALL OF THE INFORMATION ABOVE AND YOU UNDERSTAND THE INFORMATION IN THIS FORM, HAVE HAD ANY QUESTIONS ANSWERED AND HAVE RECEIVED A COPY OF THIS FOR YOU TO KEEP.

We are asking permission for your youth to participate in this program. Please complete the attached consent form and and indicate whether you do or do not want your youth to participate in the survey.

Name of Parent/Guardian/Adult-in-Life: ---------- Signature----------Date-------
Name of the students: ----------

Signature----------Date----------

APPENDIX (IV)

ASSENT

My name is **Lidiya Fiseha** and I work at Keranyo Medhanialem General Secondary School. I am asking you to take part in this research study because I am trying to collect information about the knowledge, attitude and practices related to TB among Keranyo Medhanialem General Secondary School students for
the partial fulfillment of MSC.

If you agree, you will be asked to complete a survey and the questions are about what knowledge you have regarding TB, what attitude do you have regarding TB, what are your behaviors and practices in relation to TB, and about your demographic and socio-economic factors associated with knowledge, attitudes and practices.

No one will be mad at you if you decide not to do this study. Even if you start, you can stop later if you want. You may ask questions about the study. If you decide to be in the study, I will not tell anyone else what you say or do in the study. Even if your parents or teachers ask, I will not tell them about what you say or do in the study.

Signing here means that you have read this form, or have had it read to you, and that you are Willing to be in this study.

Participant's name_____
signature of participant_____
signature of investigator_____
Date_____

V. የፈቃደኝነት ማረጋገጫ ቅጽ /Letter of Informed Consent/

የፈቃደኝነት ማረጋገጫ ቅጽ/Letter of Informed Consent/

አዲስ አበባ ዩኒቨርስቲ፡-የስነ-እንስሳት ሳይንስ ጥናት ትምህርት ክፍል

ውድወላጅ/ አሳዳጊ/

ለእርስዎ ለማሳወቅ የምንፈልግው ልጅዎ/የሚያሳድጉትልጅ/ በሚከተለው ጥናት መረጃ በመስጠት እንዲሳተፍ

መልካም ፍቃዶን እንዲያደርጉልን ነው።።

የዋናተመራማሪ ስም፡-ሊዲያፍሰሐ

የጥናቱመጠሪያ : ተማሪዋችን ስለ ቲቢ በሽታ ያላቸውን እውቀት ፣አመለካከትና ተግባራትን የሚጠይቅ መጠየቅ

ሚስጥራዊነቱ በተመለከተ ፡-ከዚህጥናትየተገኙ መረጃዎች ሚስጥር ሙሉ በሙሉ ከፍተኛ ደረጃ የተጠበቀ ነው።።

ከጥናቱ በተገኙ ማናቸውም ዘገባዎች ወይም ህትመቶች ላይ ማንነቶች ጥቅም ላይ አይውሉም።።

ስለ ጥናቱ ማንኛውም ጥያቄ ካለዎት በሚከተሉት ስልክ ቁጥሮች ደውለው ማረጋገጥ

ይችላሉ።0911784882(ሊዲያፍስሐ)

መልካም ፍቃዶ ከሆነ ልጅዎ/የሚያሳድጉትልጅ/ በጥናቱ እንዲሳተፍ ከላይ የተጠቀሰውን መልእክት በአግባቡ

ተረድተው በተለመደው ፊርማዎ እንዲያረጋግጡልን ነው።።

ለመልካም ፍቃዶ በቅድሚያ እናመሰግናለን።።

እንዲሳተፍ ፍቅጃለሁ አልፈቀድኩም (X ምልክትያመልክቱ)

_____ _____

የወላጅ /የአሳዳጊ /

ስም፡ _____ፊርማ _____

ቀን_____

የተማሪው

ስም፡_____ክፍል _____ ፊርማ _____ቀን

ማስታወሻ፡- ጥናቱ እንደተጠናቀቀ መረጃዎቹ እንዲውድሙ ይሆናል።

እናመሰግናለን!!!!!!!

APPENDIX VI.

የፈቃደኝነት ማረጋገጫ /ASSENT/

አዲስአበባ ዩኒቨርስቲ የስነእንስሳት ትምህርት ክፍል

የምርምር ፕሮጀክት ርዕስ :Assement of knowledge attitude practice on TB regarding keranio medanialme school

የዋና ተመራማሪ ስም ሊዲያ ፍስሐ

የትምህርት ቤቱ ስም :ቀራንዮ መድሀኒዓለም አጠቃላይ ሁለተኛ ደረጃ

ስለምርምሩ (ጥናት የሚነበብ)

እኔ ከአንተ /ቺ እና ከሌሎች ብዙ ተማሪዎች ጋር ይሄንየምርምር ጥናት እንድናደርግ እጠይቃለሁ ።

በዚህ ጥናትና ምርምር ፈቃደኛ የምትሆን /ኝ ከሆነ አንዳንድ ጥያቄዎችን እጠይቃለሁ ።ጥያቄዎቹ ሁልጊዜ በክፍል ውስጥ እንደምትጠየቁት አይደለም የሚያዝ ውጤት የለውም ወይም የናንተን የክፍል ውጤት የሚጎዳ አይደለም።ሁሉንም የተጠየቃችሁትን ጥያቄ በጥሩ ሁኔታ መመለስ ትችላላችሁ ። መምህራኖቻችሁ ፣ወላጆቻችሁ ወይም ሌሎች ተማሪዎች ስለ ስራችሁት ስራ ምንም የሚያዉቁት ነገር አይኖርም ።ሚስጥራዊነቱ በእኔ እና በእናንተ የተጠበቀ ይሆናል።

ወላጆቻችሁ ፈቃድ ከሰጧችሁ በኋላ ቢሆንም እንኳን በማንኛውም ግዜ መስራት ካልፈለጋችሁ ፍላጎታችሁ የተጠበቀ ይሆናል

ማንኛዉም ጥያቄ ካላችሁ መጠየቅ ይቻላል

በተጨማሪም የጥናቱ ተሳታፊ ባለመሆናችሁ የክፍል ውጤታችሁ ምንም የሚጎዳ ነገር አይኖረውም።

ሆኖም ግን እናንተ የምትስጡን መረጃ የቲቢ በሽታ እያደረሰ ያለውንጫና ለመቀነስ የሚረዳ ነው።

በዚህ ጥናት ተሳታፊ ለመሆን ፍቃደኛ ከሆናችሁ በዚህ ወረቀት ላይ ከታች በተቀመጠው ክፍት ቦታ በፊርማችሁ ታረጋግጣላችሁ። በዚህ ጥናት ሂደት ወቅት ለሚኖር ማንኛውም ጥያቄ የጥናቱ ተመራማሪ መልስ ይስጣል

የጥናቱ ተመራማሪም በሂደቱ ተሳታፊ ይሆናል።

ፊርማ ----------