

YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF ECONOMICS
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**EFFECT OF COMMUNITY HEALTH VOLUNTEERS
(DOTS PROVIDERS) ON TB KNOWLEDGE AND DOTS
ACTIVITIES IN KENG TUNG TOWNSHIP**

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**EFFECT OF COMMUNITY HEALTH VOLUNTEERS (DOTS
PROVIDERS) ON TB KNOWLEDGE AND DOTS ACTIVITIES IN
KENG TUNG TOWNSHIP**

A thesis submitted in partial fulfillment of the requirements for the Master of
Development Studies (MDevS) Degree.

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ABSTRACT

The purpose of the study is to investigate how DOTS providers and TB awareness are affected in Keng Tung by community health volunteers. The aims of this study are to ascertain the effect of community health volunteers on the knowledge of tuberculosis and access to DOTS and to examine the correlation between patients' TB knowledge, participation in DOTS and education. Using simple random sampling, information according to objectives was gathered from community health volunteers and TB patients. According to the study, volunteers feel favorably about their access to DOTS, and TB patients have a moderate degree of awareness about the disease. The study found no correlation between education and patients' participation in DOTS, although there is a statistically significant substantial positive relationship between education and TB patients' knowledge. According to the study, efforts should concentrate on increasing awareness about tuberculosis, identifying obstacles to DOTS access, and providing the necessary resources and assistance to have an impact on lowering TB morbidity and death.

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LIST OF ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
CHW	Community health worker
CBO	Community-based organization
CB-DOTS	Community Based Directly observed treatment short course.
DOTS	Directly Observed Treatment Short Course
HIV	Human immunodeficiency virus
IPC	Infection prevention and control
NGO	Non-governmental organization
NTP	National Tuberculosis Program
PPM	Public-Private Mix
TB	Tuberculosis
WHO	World Health Organization
UNAIDS	United Nations on HIV/AIDS

CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

In Myanmar, tuberculosis continues to be a leading cause of morbidity and mortality and one of the world's most serious public health issues. According to estimates from the World Health Organization (WHO), TB kill over 1.4 million people worldwide in 2020 and infect roughly 10 million people. The 2009–2010 National TB Survey in Myanmar reported a bacteriologically proven TB prevalence of 613 per 100,000 people aged 15 and older, indicating a very high TB burden. According to the World Health Organization's (WHO) Global Tuberculosis Report (2015), an estimated 9.6 million people infected tuberculosis (TB), and 1.5 million of those cases resulted in death.

Myanmar is one of the 30 high-burden TB nations, with an estimated TB incidence and prevalence of 369 and 457 per 100,000 people, respectively, based on the National Tuberculosis Programme, Annual Report (2015). PLOS Global Public Health (June 14, 2022) reports that unchecked urbanization, aging populations, migration, and inadequate access to healthcare facilities in rural regions are among the issues contributing to Myanmar's persistently high TB prevalence. More focus needs to be placed on decentralization, multisectoral methods, and the integration of primary care institutions with basic TB services.

In 2011, the Myanmar National TB Programme (NTP) initiated Community Based TB Care (CBTC) programs in three states and five regions of the nation, working with four regional NGOs. Keng Tung in Eastern Shan States is one of the townships putting community-based initiatives into practice and one of high TB prevalence townships because of the rising number of migrants, low levels of education, and problems with health services, distant location, socioeconomic obstacles, ethnic variety, and ongoing conflict. Even with the acknowledged advantages of DOTS providers, there are still several obstacles and information gaps. Hence, the purpose of this study is to ascertain how community health volunteers affect the knowledge, attitudes, preventive methods, obstacles, resources, and access to DOTS for tuberculosis patients in Keng Tung that can guide TB management and policy decisions and foster a more encouraging TB-free atmosphere.

1.2 Objective of the Study

The objectives are to study the effect of community health volunteers (DOTS providers) on TB knowledge and access to direct observed treatment in Keng Tung and to analyze the relationship between patients TB knowledge, their participation in DOTS and patients' education.

1.3 Method of Study

Based on primary data, the study employed chi-square and descriptive approaches. The patients and volunteers in Keng Tung were chosen using the simple random sampling technique. Out of the 400 patients and 70 volunteers, 60 volunteers and 200 patients made up the sample of the study area. Structured questionnaires were used to collect primary data from volunteers and patients. A key informant interview was done to obtain necessary data and relevant information from books, journals, articles, and websites made up the other secondary data.

1.4 Scope and Limitations of the Study

The scope is limited to conducting a study on the effect of community health volunteers' effect on patients' TB tuberculosis and their access to DOTS in Keng Tung, Myanmar. This study mainly focused on 200 patients and 60 volunteers who are included in community-based tuberculosis program in Keng Tung. The data period was from May to July 2024.

1.5 Organization of the Study

There are five chapters in this study. Chapter one is the introduction with the rationale of the study, objective of the study, method of study, scope and limitations of the study, and organization of the study. Chapter two is the literature review. Chapter three shows background history of community-based TB care conditions in Myanmar. Chapter four describes the survey analysis of the study area. Chapter five mentions the conclusion which includes findings, and suggestions.

CHAPTER II

LITERATURE REVIEW

2.1 Defining Significant Terms and Community Based TB Care Activities

Because of the way that tuberculosis affects social inequality, poverty, and economic growth, it is not only a health problem but also a wider developmental issue. Low- and middle-income nations are disproportionately affected by tuberculosis (TB), which causes large economic losses. People in their prime years are the ones most affected by the illness, which lowers labour force productivity and raises healthcare expenses. The World Health Organization estimates that by 2020, tuberculosis (TB) will have cost the world economy billions of dollars in direct medical costs as well as lost revenue from disease and death. More general developmental success is both a cause and an effect of effective TB healthcare, underscoring the significance of integrated approaches to public health and socioeconomic growth.

The World Health Organization (WHO) recommends a TB control technique called DOTS (Directly Observed Treatment, Short course), which makes sure patients finish their treatment regimens while being closely monitored by medical professionals. The DOTS strategy is made up of five main parts: a monitoring and evaluation system, impact measurement, standardized treatment with patient support and supervision, quality-assured bacteriology for case detection, effective drug supply and management, and political commitment with increased and sustained financing. Because it emphasizes patient compliance to stop the establishment of drug-resistant TB strains, it is thought to be the most cost-effective method of tuberculosis control (World Health Organization, 2020).

Community Health Workers, also known as DOTS Providers, are qualified to assist and closely monitor patients as they receive tuberculosis treatment. To guarantee that the treatment plan is followed to the end, their responsibilities also include giving health education, monitoring patient adherence, and giving medicines. By fostering early identification, diagnosis, and adherence to treatment regimens, they play a vital role as a liaison between healthcare facilities and the community, hence contributing to the improvement of TB control efforts (World Health Organization, 2020).

Knowledge about tuberculosis includes symptoms, transmission, diagnosis, treatment, and preventative measures by raising awareness of the illness. Better TB management and outcomes are associated with high levels of knowledge about tuberculosis (TB) among communities and healthcare providers (Centers for Disease Control and Prevention, 2019).

Community-based TB care activities are activities that aimed at preventing, identifying, and treating tuberculosis patients outside of official healthcare facilities and these initiatives include spreading awareness of tuberculosis (TB), helping patients stick to their treatment plans, finding contacts, lowering stigma associated with the disease, and providing direct patient care using community health volunteers. By increasing patient acceptance and accessibility to TB care, community-based initiatives have been shown to enhance treatment adherence and lower transmission rates (Khan et al., 2020).

2.2 Problems Related to Existing TB Control Programs

A nation's overall level of development is frequently reflected in the quality of its tuberculosis healthcare system. TB incidence rates are often lower in nations with strong healthcare systems, greater rates of literacy, and better living conditions. Accordingly, in international assessments, the prevalence of tuberculosis is frequently employed as a gauge of wider socioeconomic growth (Uplekar et al., 2016).

Global development goals such as the Sustainable Development Goals (SDGs) are closely associated with the management of tuberculosis. Assuring healthy lives and fostering well-being for all is the focus of Goal 3 of the SDGs, which contains particular goals to eradicate tuberculosis by 2030. Coordinated development efforts in a number of sectors, including as housing, education, and healthcare, are needed to meet this goal (United Nations, 2015).

Accessibility is a problem for TB control initiatives, particularly in isolated or rural locations. Early detection and treatment are hampered by patients' frequently restricted access to medical facilities, diagnostic centers, and treatment options. (WHO, 2020). In Sharma & Mohan (2013), due to their increased difficulty and expense of treatment, the emergence of extensively drug-resistant (XDR-TB) and multidrug-resistant (MDR-TB) strains of tuberculosis (TB) presents a serious threat to current TB control efforts.

TB control initiatives encounter challenges in nations impacted by political and economic instability, such as inadequate healthcare infrastructure and migration, which furthers the spread of tuberculosis. In 2017, Dhillon and Keshavjee published insufficient funding, which has an impact on the programs' overall quality and reach by leaving little money for things like drugs, diagnostic equipment, and healthcare infrastructure (Floyd et al., 2018).

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The lack of proper integration between TB control programs and the larger healthcare system frequently results in fragmented care and makes treating co morbidities like HIV/AIDS (Naidoo et al., 2017). One major obstacle to the control tuberculosis is still non-adherence to treatment regimens. This issue is exacerbated by elements including protracted treatment duration, adverse consequences, and inadequate patient information (Munro et al., 2017). The issues highlight the complex difficulties that tuberculosis control initiatives encounter worldwide. Governments, hospitals, and communities must work together to address these problems in order to improve the efficacy of TB control measures.

2.3 Factors Influencing Implementation of Community Tuberculosis Care

(1) General knowledge about tuberculosis

Community knowledge of tuberculosis is crucial for early diagnosis, treatment, and reducing stigma, as it supports prompt medical interventions and reduces stigma associated with the disease.

(2) Prevention

To stop the spread of tuberculosis (TB) in the community, preventive measures such as vaccination (e.g., BCG vaccine) and knowledge of infection control practices are essential. The number of new TB cases and the total burden of the disease can be considerably decreased by public health initiatives that emphasize TB prevention

(Floyd et al., 2018). It is essential to educate the public about preventive measures including using face masks, getting enough air, and coughing politely.

(3) Treatment

Comprehending the TB treatment regimen, which includes the significance of finishing the entire medication course, is crucial for the efficient handling of the illness. Treatment regimen adherence is frequently impeded by elements including long treatment durations, lack of access to healthcare facilities, and false beliefs about the adverse effects of medications (Takarinda et al., 2021). To improve treatment compliance, community-based approaches that include directly observed therapy (DOT) and support networks have shown to be successful.

(4) Attitudes towards TB

People's attitudes and views about tuberculosis have a big impact on how people react to the illness and the care they receive. People are frequently discouraged from obtaining prompt diagnosis and treatment due to stigmatization and fear of social prejudice (Courtwright & Turner, 2010). A more positive outlook on healthcare services and confidence in community health professionals can help to improve community involvement in tuberculosis treatment initiatives.

(5) Knowledge and Awareness

To control and prevent tuberculosis in communities, knowledge and awareness about the disease are essential. People are better able to seek prompt medical attention and follow recommended treatment regimens when they are informed about the symptoms, transmission, and treatment of tuberculosis (TB) through awareness campaigns and education. Research indicates that populations with more awareness about tuberculosis (TB) are likely to experience improved treatment outcomes and a decrease in the stigma attached to the illness (Khan et al., 2020).

(6) Treatment

To prevent medication resistance, it is imperative that patients finish their treatment course, which can only be achieved through the availability and accessibility of TB DOTS programs. Increased treatment adherence has been demonstrated by community-based DOTS, especially in isolated and underprivileged locations

(Mwansa-Kambafwile et al., 2018). Increased availability of DOTS services, along with assistance from nearby medical practitioners, can greatly enhance efforts to reduce tuberculosis.

(7) Access to DOTS

Direct supervision of treatment in community-based TB treatment (DOTS) ensures patients complete the entire course of therapy, leading to better treatment outcomes. Access to DOTS reduces transmission rates and improves public health. Community-based DOTS promotes active involvement of volunteers, patients, and medical professionals, leading to increased ownership and understanding of the illness control process. However, obstacles like long travel distances, financial limitations, and transportation problems can be addressed through integration with regional health systems (Volmink & Garner, 2007).

(8) Challenges to DOTS

In addition, issues with patient compliance, cultural and environmental factors, and other factors may affect how well DOT treatments work. Patients' capacity to receive TB treatment may be impacted by financial considerations such as the expense of transportation and missed income as a result of illness. Providing patients with socioeconomic support can enhance their adherence to treatment. Taniguura, T., Raviglione, M., Jaramillo, E., Weil, D., & Lönnroth, K. (2014). Sufficient infrastructure and resources, such as medical facilities, qualified staff, and medical supplies, are essential for providing community tuberculosis treatment in an efficient manner. Delays in diagnosis and treatment may result from a lack of resources (Lönnroth, K., Jaramillo, E., Williams, B. G., Dye, C., & Raviglione, M, 2009).

(9) Needed Resources

The fervor and commitment of volunteers administering Directly Observed Treatment (DOT) for tuberculosis (TB) may be affected by both internal and external variables. Significant elements that bolster these factors are self-assurance, acknowledgment, external encouragement, intrinsic drive, and a feeling of direction and impact. Acknowledgment and appreciation uplift the soul and inspire perseverance through financial support and ongoing assistance to stay committed.

(10) Volunteer Motivation and Commitment

Community health volunteers' devotion and hard work are essential assets in the fight against tuberculosis. Volunteers are essential in promoting public awareness, helping patients through their treatments, and keeping an eye on drug compliance. Research suggests that increased volunteerism is linked to better patient outcomes and lower rates of tuberculosis transmission (Takarinda et al., 2021). Sustaining these volunteers' motivation and efficacy in TB care initiatives can be achieved by providing them with sufficient training, rewards, and support.

2.4 Review on Previous Studies

In Tigray, northern Ethiopia, community health workers' awareness of pulmonary tuberculosis and readiness to oversee treatment were investigated by J. Ethiop (2005) to gather this information. In June 2002, a cross-sectional survey was carried out in eight districts of Tigray, Ethiopia. A multistage cluster sampling strategy was used to identify 279 CHWs from 70 villages. Trained nurses used a prepared questionnaire to conduct interviews with CHWs. According to the study, the mean and median PTB knowledge scores of CHWs were 79.8% and 80%, respectively. The majority (90.3%) agreed to oversee the treatment of TB. Treatment supervisors were more likely to be CHWs who live in rural communities and those who were previously eligible for free medical services.

The study "Patient Adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research" was conducted in 2007 by Munro, S. A., et al. Examining patient and healthcare professional perspectives on adherence to tuberculosis treatment's obstacles and enablers is the goal. The present investigation employed a systematic review approach to examine the factors that influence treatment adherence rates and adherence to therapy. The study revealed that societal stigma, ignorance of the illness, financial hardships, and unfavorable patient-provider relationships are important factors affecting treatment adherence for tuberculosis. One of the biggest adherence facilitators was found to be the support of family and medical professionals.

"Effect of Household and Community Interventions on the Burden of Tuberculosis in Southern Africa: The ZAMSTAR Community-Randomised Trial" was the title of a 2013 study by Ayles, H., et al. Evaluating how community-based initiatives affect the decline in tuberculosis cases in Southern Africa is the goal. Study variables were home visits, community interventions, TB incidence, and case detection rates. The

research methodology used was community-randomized controlled trial technique. According to the study, community-based interventions greatly raised the rates of tuberculosis case identification but had no discernible effect on the incidence of tuberculosis. Combining household interventions with community-based activities increased their efficacy.

The study "Financial Burden for Tuberculosis Patients in Low- and Middle-Income Countries: A Systematic Review" conducted by Tanimura, T., et al. (2014) aimed to evaluate the financial burden of tuberculosis (TB) on patients and their households in low- and middle-income countries. The financial burden on households and the cost of tuberculosis diagnosis and treatment are examined using the systematic review approach. The study came to the conclusion that the direct medical costs and income loss incurred by tuberculosis patients in low- and middle-income countries constitute significant financial burdens. In order to lessen the financial impact on patients, it underlined the necessity of social protection measures.

"Smartphone-Enabled Video-Observed Versus Directly Observed Treatment for Tuberculosis: A Multicentre, Analyst-Blinded, Randomized, Controlled Superiority Trial" was the title of a 2016 study conducted by A. Aldridge et al. The aim of this study is to evaluate the efficacy of standard directly observed treatment (DOT) and smartphone-enabled video-observed therapy (VOT) for tuberculosis patients. Treatment adherence, patient outcomes, and treatment type (VOT vs. DOT) are all examined using randomized controlled trials. The study discovered that when it came to enhancing patient outcomes and medication adherence, VOT outperformed conventional DOT. It proved that the use of digital health technologies could improve the effectiveness and reach of tuberculosis control.

In the study of "Role of Community Health Volunteers in Tuberculosis Care: Assessing Impact on Treatment Outcomes in Low-Resource Settings" to determine the effect of community health volunteers on tuberculosis care, a mixed-method approach that combined quantitative surveys and qualitative interviews were used. According to the study, community health volunteers significantly increased TB patients' adherence to treatment. In fact, 65% of patients said that their adherence to TB treatment had improved because of the volunteers' assistance and monitoring. Concerns about transportation (30%), a lack of training (40%) and incentives (30%) were among the difficulties that the volunteers identified that hindered their capacity to offer regular assistance (Doe et al., 2022).

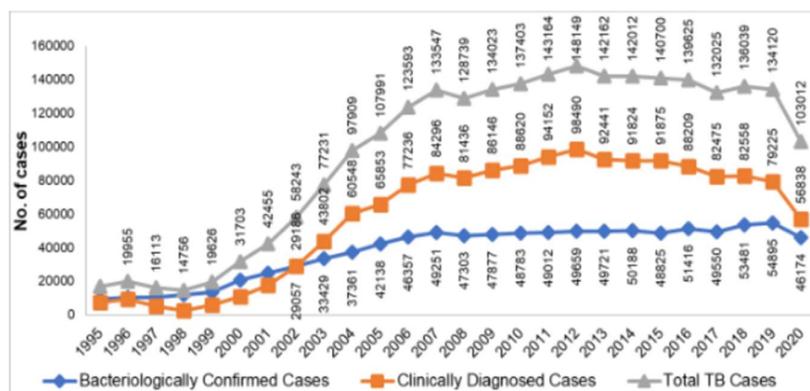
CHAPTER III

BACKGROUND HISTORY OF TB CONTROL EFFORTS IN KENG TUNG

3.1 Situation of TB Disease in Myanmar

The World Health Organization (WHO) has classified Myanmar as one of the 30 nations with a high TB burden, making the country's TB status a serious public health concern. In Southeast Asia, Myanmar has one of the highest rates of tuberculosis. The annual incidence rate is expected to be 338 cases per 100,000 people, including a significant proportion of drug-resistant TB cases. Many instances go untreated or are underreported despite government efforts (WHO, 2023). The prevalence of extensively drug-resistant (XDR-TB) and multidrug-resistant (MDR-TB) tuberculosis (TB) is becoming a greater problem in Myanmar. An estimated 5-6% of newly diagnosed TB cases have MDR-TB, compared to a substantially greater frequency of MDR-TB in previously treated individuals (National TB Programme Myanmar, 2022).

**Figure (3.1) Trends in National TB Case Notification in Myanmar
(1995-2020)**



Source: Myanmar National tuberculosis Programme data, (2021)

The figure (3.1) shows that TB case notifications in Myanmar from 1995 to 2020, exhibiting three kinds of cases such as bacteriologically confirmed cases, clinically diagnosed cases, and total TB cases, according to data from the Myanmar National Tuberculosis Programme (2021). From 1995 to 2019, there was a steady rise in the number of TB patients with bacteriological confirmation. This trend peaked in

2019. Clinically confirmed tuberculosis cases rose dramatically between 1996 and 2013, reaching a peak. Between the middle of the 1990s and 2012, there was a noticeable increase in the overall number of TB cases. Overall, the patterns demonstrate Myanmar's efforts to improve tuberculosis diagnosis and treatment, emphasizing the importance of bacteriological proof over clinical diagnosis for successful tuberculosis control.

Table (3.1) Healthcare Professionals in Myanmar (2014)

Professionals	2009-10 N	2011-12 N	2013-14 N
Medical Doctor	24,536	28,077	31,542
Public	9,728	11,675	13,099
Private	14,808	16,402	18,443
Nurse	24,242	26,928	29,532
Midwife	19,051	20,044	21,435
Pharmacist	1,998	2,405	2,553
Medical technologist	2,085	2,458	2,604
Dentist	2,308	2,770	3,219
Public	703	774	782
Private	1,605	1,996	2,437
Dental Nurse	262	316	357
Traditional Medical Practitioner	6,627	6,752	6,963
Public	890	885	1,048
Private	5,737	5,867	5,915
Lady Health Visitor	3,278	3,371	3,467
Health Assistant	1,845	1,893	2,062
Health Supervisor	2,174	2,330	5,650

Source: Ministry of Health in Myanmar, 2014

According to table (3.1), which presents statistics on healthcare professionals in Myanmar from 2009–10 to 2013–14, illustrates the number of professionals in various categories according from Ministry of Health in Myanmar (2014). These healthcare professionals are vital to the country's attempts to treat tuberculosis (TB). The increase of doctors suggests a better capacity to provide TB diagnosis, treatment, and follow-up

services. However, the increasing number of doctors working in the private sector raises the possibility that many patients will seek treatment for tuberculosis outside of the public healthcare system, which could impact the efficiency with which TB control measures are carried out.

With more nurses and midwives in the field, it may be possible to treat tuberculosis (TB) in impoverished areas. Patients would be able to get education, assistance with following their drug schedule, and directly observed treatment (DOT). The diagnosis and treatment of tuberculosis (TB), including the laboratory testing of sputum samples, depend heavily on medical technologists. The fact that these professions are growing at a slower rate suggest that enhancing diagnostic capabilities and guaranteeing that TB patients have access to high-quality medications should be top priority.

According to WHO, government and NGO from Myanmar focus on community-based initiatives to boost TB case detection and treatment adherence, particularly in remote areas. Myanmar's National TB Program is expanding healthcare personnel, improving access to diagnostic services, and ensuring free treatment for all TB patients. Collaborations with foreign organizations have reduced TB mortality and improved treatment accessibility, despite limited healthcare access and societal stigma.

3.2 Profile and Health Care Conditions in Keng Tung

Keng Tung is in Shan State, Myanmar's eastern region. Its geographic significance and varied ethnic makeup make it an important location in the nation. Situated in the Eastern Shan State, Keng Tung shares borders with China, Thailand, and Laos. The town acts as a center for trade and cross-cultural interactions with these adjacent nations. Many ethnic groups, including the Shan, Wa, Lahu, Akha, and other minority communities, make up its population. Due to the region's well-known mountainous landscape, accessing healthcare services might be difficult, particularly in isolated and rural locations (Steinberg, D. I, 2010).

The production of rice, tea, and vegetables is only a few of the agricultural products that drive the local economy of Keng Tung. Additionally, there are small-scale commerce operations and traditional handicrafts. The region's closeness to borders encourages trade but also makes health monitoring more difficult, particularly when individuals are moving between borders (Turnell, S., 2011).

The healthcare system in Keng Tung is representative of the difficulties faced by many isolated and rural parts of Myanmar and underdeveloped and has a number of issues with accessibility, resource availability, and general medical service quality. The scarcity of healthcare personnel, the inadequate infrastructure, and the difficulties in obtaining resources are characteristics of Keng Tung's healthcare system. Communicable diseases like malaria and tuberculosis are common, and traditional medicine forms a big part of the healthcare system in the area. The provision of healthcare services in the area is made more difficult by political unrest and violence.

International organizations and NGOs play a critical role in bolstering the current healthcare system and raising the standard of treatment given to the people of Keng Tung. There aren't many healthcare institutions in Keng Tung that can effectively service the city's population due to the poor healthcare infrastructure. Most healthcare services are provided by district hospitals, small private healthcare providers, and rudimentary government-run clinics.

Rural populations find it difficult to access healthcare facilities due to their remote location from urban centers and rough geographic topography (Myanmar Ministry of Health and Sports, 2020). Basic medical care is frequently unavailable in many regions, and access to emergency care is sometimes limited. Access to healthcare services is made more difficult by bad road conditions and a shortage of mobility, particularly during the rainy season (Steinberg, D. I, 2010).

Keng Tung faces a scarcity of medical personnel, such as physicians, nurses, and midwives. Because of its isolated location and lack of infrastructure, the area has trouble attracting and keeping medical staff. There is a shortage of community health workers and traditional healers in rural areas like Keng Tung, whereas most healthcare professionals are concentrated in urban areas. (Turnell, S, 2011). High rates of HIV co-infection have been observed in the area and the tools and resources required for efficient disease control and management are frequently absent from the neighborhood healthcare institutions (WHO, 2023).

In Keng Tung, traditional medicine still has a big impact on healthcare. Due to their lack of access to modern medical facilities and cultural beliefs, many locals rely on herbal treatments and traditional healers. Traditional medicine can offer primary care to some extent, but it is frequently unable to adequately treat more severe illnesses or chronic problems. (S. Lee, 2013).

Health officials' capacity to deliver consistent care has been hampered by political unrest and ethnic conflicts in Keng Tung. It is challenging to undertake long-term health interventions in these locations due to the ongoing violence, which has resulted in community displacement, travel restrictions, and decreased healthcare delivery (International Crisis Group, 2019).

3.3 TB Status in Keng Tung

Keng Tung is categorized as a high TB burden location in Myanmar, along with a large portion of Shan State. Poverty, a lack of adequate healthcare facilities, and high rates of HIV co-infection all have an impact on the prevalence of tuberculosis in this area and impede efforts to manage the disease (WHO,2023). Multidrug-resistant tuberculosis (MDR-TB) cases have been recorded, which presents a serious problem for medical professionals. The absence of consistent medical supplies and sporadic treatment adherence are blamed for the growth in drug-resistant strains (Ministry of Health and Sports, Myanmar, 2022).

For TB screening and treatment, many areas rely on volunteers from the local community and mobile health clinics. To access healthcare facilities, patients frequently have to travel long distances. This causes a delay in the diagnosis and start of TB treatment, which raises the risk of transmission among the community (K. T. Kyaw & K. N. Aye, 2020).

Keng Tung has a high proportion of co-infection with both HIV and TB, making both diseases more difficult to treat and control. The fact that this co-infection quickens the course of tuberculosis and raises mortality rates makes it especially dangerous. Due to the region's near proximity to drug trafficking routes, the prevalence of tuberculosis has increased due to an increase in intravenous drug use. This drug usage is closely linked to the transmission of HIV (UNAIDS, 2021).

To increase case detection and treatment adherence in Keng Tung, community-based TB care programs have been put into place by local health authorities in partnership with foreign NGOs. These initiatives seek to lower stigma, increase community knowledge of tuberculosis, and offer directly observed treatment (DOT). To guarantee that patients in these isolated locations receive sufficient care during their treatment, community health workers' and volunteers' involvement is essential (Stop TB Partnership, 2022).

Stigma continues to be a major obstacle to the management of tuberculosis in Keng Tung, since cultural attitudes and misunderstandings about the illness deter people from getting a timely diagnosis and treatment. Patients frequently conceal their illnesses out of fear of social rejection, which delays treatment and raises the possibility of transmission (Kyaw et al., 2019). Efforts to eradicate tuberculosis are further complicated in Keng Tung, because of political instability and ethnic strife. Conflicts have the potential to transmit tuberculosis (TB) to new areas by disrupting health services, limiting access to care, and forcing populations to flee (International Crisis Group, 2019).

3.4 Responsibilities of Community Health Volunteers in Community-Based TB Care Activities

The primary actors of the community-based tuberculosis program in the research region are volunteers from the medical community. According to the terms of the employment contract, they will be responsible for community-based TB care initiatives, which are essential to improving TB diagnosis, treatment, and prevention in local communities.

Finding people exhibiting TB symptoms and directing them to medical facilities for additional testing and diagnosis is one of the main duties of volunteers. By detecting symptomatic individuals and connecting them to diagnostic centers, they greatly increase the rates of TB case identification (Datiko et al., 2017).

DOTS is given to patients by volunteers in a lot of community-based TB care schemes. To guarantee adherence, this entails watching patients take their prescription in person. To achieve high treatment success rates, the World Health Organization (WHO) advises that the use of DOTS through CHVs is essential (WHO, 2020). They make sure TB patients take their medications as directed by their doctor. They make three weekly home visits and maintain patients' medications in order to fulfill this duty. They bring the medications to these appointments, and they ask the patient to take them right in front of the healthcare provider.

Volunteers frequently provide health education using terminology and a language that the locals understand to raise knowledge about tuberculosis. Patients and their families receive instructions from volunteers. In order to minimize medicine resistance and default, volunteers provide TB patients with psychosocial support, treatment adherence counseling, and regular medication reminders. They also monitor

the patients' progress during treatment. According to research by, CHV participation in patient support can lower treatment default rates and enhance treatment results overall (Lönnroth et al., 2019). In order to share the issues, they encounter, such as medication side effects or patients' refusal to continue treatment, they are required to report their home visit activity to their respective supervisors. Additionally, it is your duty to deliver the patient to clinics on time so that they can have many sputum examinations. The linkage role of CHVs is essential to the continuum of TB care since it improves the accessibility and use of healthcare services by those who are impacted (Frieden et al., 2017)

Volunteers must cultivate a positive rapport with TB patients. It is hoped that their presence and ongoing assistance will encourage TB patients to complete their course of therapy. Then, on their initial visit, they have to inquire about the patient's living circumstances, including the kind of home, ventilation system, and number of family members residing there, and they have to offer any recommendations they may have for enhancing the home's air circulation (Kipp et al., 2016). Additionally, they must ascertain whether any family members have displayed TB symptoms, such as a protracted cough, a bloody cough, weight loss, and so forth (Yeboah et al., 2018).

In order to lessen the stigma and discrimination that TB patients frequently experience in their communities, volunteers are essential. To provide a supportive atmosphere for TB patients, they participate in community talks and counseling (Uplekar et al., 2015).

Volunteers oversee keeping an eye on the health authorities on the progress of tuberculosis patients in the community and reporting their findings. According to Yeboah et al. (2018), monitoring and data-reporting responsibilities are crucial for keeping accurate TB case registries are essential for disease control plans. Another crucial duty is carrying out routine surveillance to spot possible outbreaks and new TB cases in the neighborhood. In order to re-engage patients in care, they also follow up with those who have been lost to follow-up (Khan et al., 2020).

3.5 Challenges and Opportunities in Community-Based TB Interventions in Keng Tung

There are several obstacles to implementing community-based TB interventions in Keng Tung Township, which fall into the categories of logistical, cultural, financial, and systemic barriers that affect the efficacy of TB control initiatives. Due to its isolated and rugged terrain, Keng Tung Township has limited access to medical care, which hinders the identification of tuberculosis cases and treatment compliance.

Geographical barriers are a significant obstacle to continuing tuberculosis care, particularly in remote and difficult-to-reach places, according to Mauch et al. (2017). Many times, there are insufficient resources like medical facilities, skilled staff, financial assistance, and diagnostic equipment to effectively manage tuberculosis in community settings. The availability and functionality of TB testing tools, pharmaceutical supplies, and personnel levels in nearby health centres are assessed through facility assessments. The use of TB therapies in low-resource settings is severely impacted by resource constraints, which might result in worse than ideal care outcomes (Lönnroth et al., 2009).

Inadequate training or a lack of qualified volunteers, inadequate communication and collaboration among various healthcare entities, including public health departments and volunteers may lead to delays in diagnosis and treatment. It is possible to monitor the implementation of process evaluations by utilizing key performance indicators such as referral completion rates, average time from symptom onset to diagnosis, and efficacy of patient follow-up. According to Uplekar et al. (2016), improving the connection between community-based initiatives and official health systems is essential to the effectiveness of tuberculosis treatments.

Access to essential therapies can be hampered by financial limitations that patients and healthcare systems must deal with, particularly in low-income areas like Keng Tung Township. The direct and indirect expenses that tuberculosis patients and their families pay can be measured by utilizing the "Patient Cost Surveys" that the World Health Organization established to assess the economic impact of patients.

According to Tanimura et al. (2014), TB patients' out-of-pocket costs provide a major obstacle to starting and finishing treatment, which has a negative impact on their health. Effective dissemination of health messages and treatment standards may be hampered by linguistic barriers and low literacy rates in the community. Focus groups can be used to discover specific needs after literacy and language evaluations among

TB patients and the general public are conducted to identify communication gaps. Language limitations have a major impact on patients' comprehension of tuberculosis treatment procedures, which can affect treatment adherence in multiethnic settings (Baral et al., 2015).

The advent of drug-resistant tuberculosis infections presents a noteworthy obstacle to community-based therapies because of the intricacy of treatment protocols and their elevated expenses. It is possible to quantify the challenge of drug-resistant tuberculosis (DR-TB) by tracking its incidence by drug-resistance testing and comparing the treatment outcomes of affected individuals to those of drug-sensitive TB patients. According to Nahid et al. (2019), effective management of DR-TB in community-based settings requires specific training and resources.

The examination of TB intervention effectiveness is hampered by poor data collection, which is frequently the result of inadequate monitoring and evaluation systems. Patient satisfaction, treatment outcomes, and TB detection rates can all be gathered by using a systematic monitoring and evaluation (M&E) system. According to Frieden et al. (2017), reliable M&E systems are necessary to monitor advancement.

People frequently put off seeking prompt diagnosis and treatment due to stigma surrounding tuberculosis and cultural beliefs. Misconceptions and traditional beliefs around tuberculosis can deter the people in Keng Tung Township from utilizing contemporary healthcare services. According to Courtwright and Turner (2010), stigma is an important issue to address in community-based interventions since it greatly lowers people's desire to participate in TB treatment.

In Keng Tung Township, the introduction of community-based TB interventions presents several chances to improve TB care and control. By putting community-based interventions into practice, residents will become more aware of the signs and transmission of tuberculosis, which will enable early case detection. Pre- and post-intervention surveys measuring knowledge levels about tuberculosis symptoms, mechanisms of transmission, and the significance of seeking early medical assistance can be used to evaluate this.

According to Buu et al. (2019), community awareness initiatives in comparable rural locations greatly increased early detection rates and decreased diagnostic delays. Active participation from locals is encouraged via community-based interventions, which increases their sense of accountability and ownership for TB prevention initiatives. The number of community members taking part in TB awareness events,

support groups, or volunteer work associated with TB care can be used to gauge the level of community engagement. Involving community members in TB programs led to higher levels of involvement and better health outcomes (Khan et al., 2020).

Incorporating community-based treatments into Keng Tung Township may result in increased patient follow-up, better use of available healthcare resources, and greater coordination between official health services and community health volunteers. Health system performance metrics, such as the quantity of patients referred by community health volunteers, the time it takes to diagnose a condition, and the degree of collaboration between community-based and medical facilities, can be used to assess this. According to Uplekar et al. (2016), community-based strategies optimize available local healthcare resources, which lessens the demand on centralized healthcare services.

Community-based interventions have the potential to enhance the availability of tuberculosis diagnostic and treatment services for marginalized and difficult-to-reach groups in Keng Tung Township, including ethnic minorities and those residing in isolated regions. The number of patients treated and diagnosed with tuberculosis (TB) in underserved or rural locations, both before and after the intervention, can be used to gauge access to TB services. Yeboah et al. (2018) stated that community-based TB initiatives improved health equality and access by successfully reaching marginalized communities.

CHAPTER IV

SURVEY ANALYSIS

4.1 Survey Profile

The study focuses on the Keng Tung region which is one of the places with community-based TB care interventions in Myanmar with the support of NGO/INGOs. As per 2019 township profile data, total population is 164253 and there are 5 wards, 31 village tracts and 718 villages. Currently, 70 volunteers are covering 400 TB patients from 31 village tracts in Keng Tung township. The survey was carried out with 60 volunteers out of 70 and 200 patients out of 400 patients in Keng Tung.

Table (4.1) Number of Trained Volunteers from Selected Village Tracts

Township	Trained Volunteers	Sample volunteers from selected village tracts	
Keng Tung	70	1. Naung Kone	8
		2. Kat Htike	7
		3. Kat Pha	2
		4. Lwal Mway	5
		5. Yang Kha	7
		6. Maing Pat	6
		7. Tar Lay	5
		8. Namt Inn	6
		9. Narr Paw	6
		10. Maing Zin	8
Total			60

Source: Survey Data, (2024)

Table (4.2) Number of TB Patients from Selected Village Tracts

Township	Patients	Sample Patients from selected village tracts	
Keng Tung	400	1. Kat Pha	15
		2. Lwal Mway	10
		3. Yang Kha	8
		4. Maing Pat	12
		5. Naung Kone	13
		6. Kat Htike	10
		7. Narr Paw	13
		8. Tar Lay	16
		9. Namt Inn	19
		10. Maing Zin	18
		11. Mong Lan	16
		12. Kat Taung	15
		13. Mong Lat	20
		14. Wat Saung	15
Total			200

Source: Survey Data, (2024)

4.2 Survey Design

The survey was designed to study the effect of community health volunteers (DOTS Providers) on the implementation of community-based TB care in Keng Tung and to implement the objectives: to examine the effect of community health volunteers (DOTSP) on TB knowledge and access to direct observation of treatment in Keng Tung and to analyze the relationship between TB knowledge, access to DOTS and education in Keng Tung Township.

Simple random sampling technique was used to select samples from target population, volunteers and TB patients in the survey area with primary data survey collection. The survey was carried out in Keng Tung, and according to Krejcie and Morgan (1970) table, the sample respondents were 60 volunteers and 200 patients for this study.

Data was collected by distributing the structured questionnaires in the field from May to July 2024. The questionnaire is constructed in five separate sections. The first

section is the demographic data of volunteers and patients. It consists of basic characteristics of age, gender, education, occupation and working experience. The second section is about the assessment of TB knowledge for patients by a five-point Likert scale. The third section is about training, working years and health talks. The fourth section includes assessment on directly observed treatment for volunteers by a five-point Likert scale including challenges and needed resources. Regarding data analysis for survey data collection, descriptive statistics such as frequencies, percentages, mean, and standard deviation were calculated in this study. Moreover, Pearson Chi-Square tests were used to assess the relationship between TB knowledge, participation of patients in directly observed treatment and their education.

4.3 Analysis of Survey Results

4.3.1 Demographic Characteristics of TB Patients

Table (4.3) Demographic Characteristics of TB patients

Demographic Characteristics	Frequency	Percentages
Total	200	100%
Gender		
Male	106	53
Female	94	47
Age Group		
18-25	50	25
26-35	26	13
36-45	38	19
46-55	40	20
56 and above	46	23
Educational Qualification		
Primary	32	16
Secondary	30	15
Tertiary	10	5
No education	128	64
Occupation Level		
Farmers	133	67
Jobless	18	9

Own business	26	13
Others	23	11

Source: Survey Data, (2024)

According to table (4.3), the data interpretation based on gender distribution, is male (53%) indicates that slightly more than half of the TB patients in the survey were male. This may suggest a slight male dominance in participation or representation in the surveyed village population. Female (47%), close to half of the respondents were female that there is a significant female representation in the survey, though slightly less than the male participation. In general, the gender distribution in the survey is relatively balanced, with only a 6% difference between male and female respondents. This balance is important in ensuring that the perspectives and experiences of both genders are adequately represented in the survey findings.

The age group data provided shows the percentage of TB patients between 18 to 25 years is 25% that represents the largest proportion of TB patients in the survey. It indicates a significant level of engagement among younger adults. This could suggest that the younger population is more active or interested in the issues being surveyed or more available to participate. The age group between of 56 years and above is 23%, older patients form a notable part of the survey group. Their strong participation could indicate their concern or interest in community-related issues, which may affect their future or the future of younger generations. 20% of patients show the age group between 46 to 55 years that suggests that middle-aged TB patients are active in the community or have an interest in the subject matter. 19% of patients are the age category between 36 to 45 years, representing nearly one-fifth of the surveyed population, this group likely includes individuals who are balancing work and family responsibilities but still find time to engage in the survey. 13% of patients are in the age group between 26 to 35 years that people in this age range are less available, possibly due to career or family obligations.

Regarding data of patients on educational level, the largest portion of the population (64%) has no formal education at all. This is a critical finding as it points to widespread educational deprivation, which can significantly impact economic opportunities, health outcomes, and overall quality of life in the community. Only 16% of patients have completed primary education, which indicates that some access to basic education exists but is relatively limited. 15% of patients have attained secondary

education and only a fraction of those who complete primary education continue to the secondary level. 5% of patients have achieved tertiary education that reflects limited access to higher education, which may be due to financial, geographical, or systemic barriers.

According to the data on the occupation percentage, 67% of patients are working as farmers, indicating agriculture is the dominant occupation in study area. 13% of patients are working as own business showing some degree of entrepreneurial activity. 11% of patients are Christian monk that highlights the presence of religious or community-focused roles within the village. 9% of patients are jobless which could signal limited economic opportunities or seasonal employment issues in the area.

4.3.2 Analysis on Assessment of TB Knowledge (Patients)

(1) General Knowledge about TB

Table (4.4) Descriptive Statistics of ‘General Knowledge about TB’

No.	Statement	Mean Value	SD
1	I am aware that tuberculosis (TB) is a serious health issue.	2.96	0.99
2	I know that TB is caused by bacteria and not by poor hygiene or other factors.	3	0.63
3	TB can be transmitted through the air when an infected person coughs or sneezes.	3.1	0.75
4	I can identify the main symptoms of TB, such as a persistent cough, fever, and weight loss.	3	0.64
5	I believe that TB affects both young and old people equally.	3.2	0.51
	Overall Average Value		3.05

Source: Survey Data, (2024)

According to the data of General Knowledge about TB in table (4.4), an average value of 3.05 indicates that, on average, patients might have a moderate awareness and understanding of TB as a health issue, its causes, symptoms, and the fact that it can

affect people of all ages. Awareness about TB's mode of transmission seems moderate, with some respondents possibly uncertain about how exactly it spreads. Some patients may know the symptoms, but there might be gaps in their ability to recognize all the signs of TB. There might be a slight misconception among patients regarding the age distribution of TB, as some could believe it disproportionately affects a specific age group. Overall, the average score suggests that while there is some awareness and knowledge about TB, there are also areas where education and awareness efforts could be improved to enhance understanding. This also indicates that most patients have a moderate to slightly positive understanding of TB-related information, but there is needed for improvement in their knowledge. It suggests that while some patients may be well-informed, others might have gaps in their understanding, highlighting the need for more targeted education and awareness efforts.

(2) Knowledge of TB Prevention

Table (4.5) Descriptive Statistics of ‘Knowledge on TB Prevention’

No.	Statement	Mean Value	SD
1	I understand that TB can be prevented by avoiding close contact with infected individuals.	3.27	0.55
2	Vaccination is an effective way to prevent TB.	3.3	0.63
3	Maintaining good ventilation in homes helps reduce the risk of TB transmission.	3.21	0.55
4	Covering your mouth when coughing or sneezing can prevent the spread of TB.	3.22	0.64
5	It is important for people to wear masks in crowded places to prevent TB.	3.31	0.51
	Overall Average Value	3.26	

Source: Survey Data, (2024)

In table (4.5), the average value (3.26) suggests that patients have a reasonable level of understanding regarding TB prevention measures, and they moderately agree with the importance of avoiding close contact with infected individuals, the effectiveness of vaccination, maintaining good ventilation, covering the mouth when

coughing or sneezing, and wearing masks in crowded places. Since the score is not very high, it might imply that not everyone fully practices or acknowledges the importance of these preventive measures consistently. It indicates that while some individuals might already be practicing these measures, there are others who may need more encouragement or better understanding to fully commit to TB prevention practices. This interpretation suggests a mixed level of adherence to TB prevention strategies, highlighting the need for ongoing education and awareness to achieve higher levels of compliance and understanding.

(3) Knowledge of TB Treatment

Table (4.6) Descriptive Statistics of ‘Knowledge on TB Treatment’

No.	Statement	Mean Value	SD
1	I am aware that TB can be cured with proper treatment.	3.64	0.75
2	TB treatment needs to be taken for a long period, typically 6 months or more.	3.7	0.45
3	Stopping TB treatment before completion can make the disease harder to cure.	3.63	0.99
4	If someone is diagnosed with TB, they should seek treatment at a hospital or clinic immediately.	3.62	0.75
5	I know where to go for TB testing and treatment in my community.	3.61	0.51
	Overall Average Value	3.64	

Source: Survey Data, (2024)

In table (4.6), a score of 3.7 indicates that patients have a good understanding of the necessity for long-term commitment to TB treatment. The positive score (3.61) suggests that many patients are knowledgeable about the locations for testing and treatment within their community. An average value of 3.64 reflects that while there is generally good awareness and understanding among patients about TB treatment and its requirements.

(4) Attitudes toward TB

Table (4.7) Descriptive Statistics of ‘Attitudes toward TB’

No.	Statement	Mean Value	SD
1	I feel comfortable interacting with people who have TB.	3.05	0.64
2	I believe that people with TB should be isolated from their families until they are cured.	3.1	0.51
3	TB patients should not be stigmatized by the community	3.11	0.45
4	If I suspect someone has TB, I encourage them to see a doctor	3.05	0.99
5	People with TB can lead normal lives if they follow the treatment plan	3.06	0.51
	Overall Average Value		3.07

Source: Survey Data, (2024)

In table (4.7), a mean value of 3.05 on a scale of 1 to 5 suggests a neutral to slightly positive attitude towards interacting with people who have TB. This indicates that, on average, patients reflect a moderate level of acceptance. With a mean score of 3.11, patients show a moderately positive attitude towards stigmatizing TB patients. This value suggests a general awareness that stigma should not be associated with the disease, indicating a willingness to view TB patients with empathy and understanding. The mean value of 3.05 reflects a neutral to slightly positive attitude towards encouraging suspected TB patients to seek medical help. This response highlights a basic awareness of the importance of early diagnosis and treatment but also suggests that there might be room for improvement in proactive health-seeking behaviors within the community.

(5) **TB Information and Awareness**

Table (4.8) Descriptive Statistics of ‘TB Information and Awareness’

No.	Statement	Mean Value	SD
1	I feel I have enough information about how TB is spread and how to prevent it.	3.35	0.99
2	I have learned about TB from local health workers or community health programs.	3.4	0.64
3	There is enough TB education and awareness in my village	3.36	0.51
	Overall Average Value		3.36

Source: Survey Data, (2024)

In table (4.8), the mean value of 3.35 suggests that patients generally feel somewhat confident in their understanding of TB transmission and prevention. This indicates a moderately positive level of knowledge among the community members, but there may still be gaps in their awareness that could benefit from additional education. The mean score of 3.4 reflects a positive impact of local health workers and community health programs in disseminating TB information. It indicates that many patients have received knowledge from these sources, which plays a crucial role in community education and awareness.

The average mean value of 3.36 across these statements indicates a generally positive attitude towards the level of TB knowledge and education in the community. While the patients feel reasonably informed about TB, they may not be completely satisfied with the amount of information and education they receive.

(6) **Perception on Volunteer Activities such as Awareness Activity and DOTS**

Table (4.9) Descriptive Statistics of ‘Perception on Volunteer Activities such as Awareness Activity and DOTS’

No.	Statement	Mean Value	SD
1	Perception on contributing TB awareness raising sessions in the community by volunteers	3.15	0.76

2	Perception on contributing DOTS activity in the community by volunteers	4.295	0.59
	Overall Average Value	4.42	

Source: Survey Data, (2024)

In table (4.9), the mean value of 3.15 indicates a neutral to slightly positive perception regarding the role of volunteers in raising TB awareness in the community. This suggests that while there is some recognition of the volunteers' efforts, the impact of these sessions may not be perceived as highly effective or influential. It points to the need for more structured or impactful awareness-raising activities to enhance community engagement and knowledge. The mean value of 4.295 reflects a strongly positive perception of volunteers' contributions to DOTS activities in the community. This high score suggests that community members greatly value the role of volunteers in supporting and monitoring TB patients through the DOTS strategy, recognizing their efforts as essential to ensuring treatment adherence and overall TB management.

The overall average mean value of 4.42 across these perceptions indicates a very positive view of the volunteers' contributions, especially in relation to DOTS activities. This suggests that while awareness-raising efforts might need further improvement, the community highly appreciates and acknowledges the critical role that volunteers play in supporting TB treatment through the DOTS strategy.

Table (4.10) Summary for Descriptive Statistics of ‘TB Knowledge’

Description	Mean	Std. Deviation
General Knowledge about TB	3.26	0.7
Knowledge on TB Prevention	3.64	0.58
Knowledge on TB Treatment	3.65	0.69
TB Information and Awareness	3.57	0.71
Perception on Volunteer Activities such as Awareness activity and DOTS	4.42	0.68

Source: Survey Data, (2024)

Based on the descriptive statistics of TB knowledge in table (4.10), in analyzing the overall summary, the highest mean score is in the ‘Perception on Volunteer

Activities’, indicating that respondents generally have a very positive attitude towards these activities. ‘Knowledge on TB Prevention’ has a relatively higher mean compared to other areas, showing that patients are more knowledgeable about prevention than about general TB knowledge or treatment. The variability of standard deviations in responses is moderate across all categories, with the ‘Knowledge on TB Prevention’ showing the least variability, suggesting a more uniform understanding among patients. This summary indicates that while there is a reasonable level of knowledge about TB among respondents, there is need for improvement, particularly in areas of TB treatment and general information. Volunteer activities are well-regarded, which may provide a good foundation for increasing awareness and knowledge.

4.3.3 Demographic Characteristics of Volunteers

According to table (4.11) on demographic characteristics of community health volunteers, 58% of the volunteers are male and 42% of the volunteers are female, meaning that the gender distribution shows a moderate imbalance with more male volunteers than female, but both genders are fairly represented.

In table (4.11), 38% of volunteers indicates the age group between 36 to 45 years old is that more mature adults are the most actively involved volunteers. 35% of volunteers are included in the age group between 26 to 35 years old, 17% are between 18 to 25 years old and 8% of volunteers are in the age group between 46 to 55 years old. 2% of volunteers are 56 years and above that the smallest group of older adults, possibly due to factors such as health or other responsibilities, are the least likely to participate.

According to the data shown in table (4.11), many volunteers (57%) have completed secondary education, indicating a moderately educated group and these volunteers are likely to have a solid understanding of health-related instructions and can effectively contribute to community health efforts. 13% of volunteers have completed primary education and a limited number of volunteers have basic literacy and numeracy skills. 10% of the volunteers have secondary education, possibly with specialized knowledge or critical thinking skills that can enhance the quality of their contributions to health-related work. 8% of volunteers have no formal education and they can face challenges in understanding complex health information or instructions, possibly requiring additional support or training.

Table (4.11) Demographic Characteristics of Community Health Volunteers

Demographic Characteristics	Frequency	Percentages
Total	60	100%
Gender		
Male	35	58
Female	25	42
Age Group		
18-25	10	17
26-35	21	35
36-45	23	38
46-55	5	8
56 and above	1	2
Educational Qualification		
Primary	32	13
Secondary	30	57
Tertiary	10	22
No education	128	8
Occupation Level		
Farmers	42	70
Jobless	4	7
Own business	7	12
Others	7	11
Trainings		
Yes	38	63
No	22	37
Working years (for volunteers)		
Less than 1 year	43	72
More than 1 year	17	28
TB Health Talks		
Always	44	73
Sometimes	56	27

Source: Survey Data, (2024)

According to the occupational data shown in table (4.11), 70% are farmers, which shows that most of the volunteers are involved in agriculture, and they may be from areas where farming is a predominant occupation. 12% of volunteers own a business, this indicates that a notable portion of volunteers are entrepreneurs or business owners. 11% are categorized as others, this percentage reflects a significant contribution from religious individuals, such as Christian monks, who may view volunteerism as part of their spiritual or communal duties. Their involvement highlights the importance of faith-based or communal motivations in the volunteer base. 7% of volunteers are jobless that a minor portion of volunteers are unemployed, and some individuals still choose to engage in volunteer work, possibly to contribute to their community.

As per table (4.11), 63% of community health volunteers have completed volunteer trainings and indicates that they are well prepared give health talks, recognize symptoms and signs of TB and refer appropriately, supervise medication and create awareness to the population they live in. 37% of volunteers did not receive any trainings on tuberculosis that they cannot recognize symptoms and signs of tuberculosis and make a diagnosis or supervise the treatment (DOTS).

As per the data on the working years of volunteers in table (4.11), 72% of volunteers have less than 1 year of working experience, indicating a frequent turnover or a recent influx of volunteers. It also implies that training and orientation programs may be crucial to ensure that volunteers gain the necessary skills and knowledge to be effective in their roles. 28% of volunteers have 1 to 3 years of experience indicating that the presence of more experienced volunteers provides an opportunity for counselling of patients and transferring their knowledge to newer volunteers.

According to the data on health education talks of volunteers in table (4.11), 73% of volunteers always talk about tuberculosis during their home visits and 27% will sometimes have a session on Tb during home visits. There are no participants who have never talked about Tb while visiting the homes. These findings show that volunteers can provide services at household level that include a community- based information system, dialogue based on information, health promotion, disease prevention, simple curative care using drugs supplied.

4.3.4 Analysis of Assessment on Directly Observed Treatment (For Volunteers)

(1) General Access to Directly Observed Treatment (DOT)

Table (4.12) Descriptive Statistics of ‘General Access to Directly Observed Treatment’

No.	Statement	Mean Value	SD
1	The transportation system in my area allows me to reach TB patients for DOT easily.	2.9	0.99
2	I have sufficient time in my daily schedule to provide DOT services to TB patients.	3.5	0.64
3	TB patients in my area have easy access to the treatment center for DOT supervision.	2.6	0.51
4	There are enough health facilities nearby where TB patients can receive DOT	2.5	0.45
5	I can easily arrange my visits to observe TB patients take their medication	3.5	0.99
6	The involvement of health volunteers improves community members' adherence to tuberculosis treatment.	3.32	0.51
7	Patients are participated in DOTS activity conducted by volunteer.	3.15	0.99
Overall Average Mean Value		3.5	

Source: Survey Data, (2024)

In table (4.12), a mean value of 3.5, this suggests that most volunteers feel they have enough time in their schedules to deliver DOT services, indicating a positive aspect in terms of time availability. A mean value of 2.5 shows that volunteers generally disagree with this statement, implying a lack of sufficient health facilities in the area. This could be a significant barrier to providing accessible DOT services for TB patients. With a mean value of 3.5, it indicates that volunteers find it relatively easy to organize their visits to supervise patients, which is a positive sign for the continuity of care. A mean value of 3.15 indicates slight agreement with this statement, suggesting that TB patients are moderately engaged in DOTS activities conducted by volunteers.

(2) Challenges in Accessing DOTS

Table (4.13) Descriptive Statistics of ‘Challenges in Accessing DOTS’

No.	Statement	Mean Value	SD
1	I face difficulties in accessing some TB patients due to the long distances involved.	4.42	0.59
2	The terrain or infrastructure (e.g., poor roads, lack of transportation) hinders my ability to provide DOT.	4.1	0.76
3	Some TB patients do not comply with scheduled DOT visits, making access difficult.	3.9	0.59
4	I feel that weather conditions (e.g., rain, heat) affect my ability to reach TB patients for DOT.	4.3	0.51
5	Language or cultural barriers make it difficult for me to access and communicate with TB patients during DOT.	4.2	0.41
Overall Average Mean Value		4.30	

Source: Survey Data, (2024)

In analysis of challenges such as transportation, infrastructure, patient compliance, weather condition and language or cultural barriers regarding Directly Observed Treatment (DOT) in table (4.13), a mean value of 4.42 indicates a significant challenge in accessing TB patients due to geographical distance. This high score suggests that long distances are a major barrier for healthcare workers or volunteers in providing consistent and effective care to TB patients. It highlights the need for strategies to address logistical challenges, such as improved transportation or the establishment of more localized treatment centers. The mean value of 3.9 suggests that non-compliance with scheduled Directly Observed Treatment (DOT) visits is also a considerable challenge in TB care, although it is not as severe as the issue of distance. This indicates that patient adherence to treatment schedules remains a problem, likely due to factors such as lack of awareness, stigma, or other personal and socio-economic barriers. The average mean value of 4.3 across these statements signifies that access to TB patients, primarily due to logistical challenges and non-compliance with treatment

schedules, is a major issue. This high means score points to significant obstacles that hinder the effective implementation of community-based TB care.

(3) Support and Resources for Access to DOTS

Table (4.14) Descriptive Statistics of ‘Support and Resources for Access to DOTS’

No.	Statement	Mean Value	SD
1	I receive adequate support from healthcare professionals in accessing TB patients for DOT.	2.38	0.45
2	I have the necessary resources (e.g., transportation, protective equipment) to effectively provide DOT to TB patients.	2.4	0.99
3	I am well-trained in how to handle any challenges that arise during DOT supervision.	2.39	0.64
4	I feel supported by the local community in carrying out DOT visits for TB patients.	2.3	0.51
5	I receive timely updates and communication from healthcare professionals about any changes in the DOT procedures	2.38	0.99
	Overall Average Mean Value	2.37	

Source: Survey Data, (2024)

In table (4.14), the mean value (2.4) suggests that most respondents do not feel they have adequate resources for effectively providing DOT. They may lack essential items like transportation and protective equipment, which can hinder their ability to deliver services efficiently. The mean value (2.3) suggests a perception of limited community support among the volunteers. They may feel that the local community is not actively involved or that there is insufficient encouragement to help them during their visits. The overall mean of 2.37 points to a general sense of inadequacy in resources, training, community support, and communication from healthcare professionals.

(4) Volunteer Motivation and Commitment

Table (4.15) Descriptive Statistics of ‘Volunteer Motivation and Commitment’

No.	Statement	Mean Value	SD
1	I am motivated to continue providing DOT services despite the challenges I face.	3.03	0.51
2	I believe my work as a DOT volunteer is making a significant impact on TB patients' treatment outcomes.	3.3	0.99
3	I feel confident in my ability to ensure TB patients take their medication regularly through DOT.	3.9	0.64
4	I feel recognized and appreciated for the work I do in providing DOT to TB patients.	3.8	0.51
5	I am willing to continue working as a volunteer for TB patients as long as my support needs are met.	3.8	0.45
Overall Average Mean Value		3.57	

Source: Survey Data, (2024)

In analysis of volunteer motivation and commitment regarding TB Directly Observed Treatment (DOT) in table (4.15), the mean value of 3.03 indicates a neutral to slightly positive level of motivation among DOT volunteers to continue their services despite the challenges they encounter. While the motivation is not very strong, it shows that volunteers are somewhat committed, but their dedication might be influenced by the difficulties they face in their roles. With a mean value of 3.3, volunteers have a moderately positive belief that their work is making a difference in TB patients' treatment outcomes. This suggests that volunteers see some value in their efforts and recognize their contribution to the community, even though there may be a need for more tangible results or appreciation to boost their morale. The mean score of 3.9 indicates a high level of confidence among DOT volunteers in their ability to ensure that TB patients adhere to their medication schedules. This high confidence level is a positive sign, showing that volunteers feel capable and effective in their roles in supporting TB treatment adherence. The average mean value of 3.57 suggests that DOT volunteers generally have a positive attitude toward their role and feel relatively confident in their ability to make a difference, despite facing certain challenges. Their

motivation level is moderate, but their confidence in their impact and ability to support TB patients remains strong.

4.3.5 Relationship between Patients' Education and their TB Knowledge

Table (4.16) Relationship between Patients' Education and their TB Knowledge

Variable		TB Knowledge		Chi Square	P-value
		Agree	Neutral		
Education	No education	52	76	13.731	0.001
	Primary	15	18		
	Secondary and above	29	10		
	Total	96	104		

Source: Survey Data, (2024)

In table (4.16), the Pearson Chi-Square Tests between patients' education and their TB knowledge among the 200 TB patients results show a significant association between their education level and TB knowledge. The p-value (Asymptotic Significance) of 0.001 is well below the standard significance level of 0.05, indicating that the differences in TB knowledge between various education groups are statistically significant. This means that education levels likely influence the level of TB knowledge among patients. The significant result ($p = 0.000$) suggests that as education level increases, there is a consistent improvement in TB knowledge.

4.3.6 The Relationship between TB Patients' Education and their Participation in DOTS

Table (4.17) Relationship between Patients' Education and their Participation in DOTS

Variable		TB Knowledge		Chi Square	P-value
		Agree	Neutral		
Education	No education	77	51	1.600	.449
	Primary	19	14		
	Secondary and above	19	20		
	Total	115	85		

Source: Survey Data, (2024)

Based on the results of the relationship conducted between TB patients' education and their participation in Directly Observed Treatment Short-Course (DOTS) for 200 patients in table (4.17), the p-values are greater than 0.05 in Pearson Chi-Square and this indicates that there is no statistically significant association between TB patients' education levels and their participation in the DOTS program. The lack of significance means that the level of education of TB patients does not significantly influence whether they participate in the DOTS program or not.

CHAPTER V

CONCLUSION

5.1 Findings

According to demographic characteristics of TB patients, 53% of male and 47% of female patients are participated in the survey and suggest a slight male dominance in participation. 25% of patients are in the age group between 18 to 25 years and find that the younger population is more active to participate. Regarding the educational level of patients, 64% have no formal education at all which can significantly impact economic opportunities, health outcomes, and overall quality of life in the community. According to the occupation data, 67% of patients are working as farmers, indicating agriculture is the dominant occupation in study area.

According to the findings, patients' awareness of tuberculosis (TB) ranges from moderate to good, and their comprehension of both prevention and treatment is high. Although they are fairly knowledgeable about TB prevention strategies, they may still do better. Although they have a solid understanding of TB treatment procedures, there is still an opportunity for improvement. Although they are well-informed and aware of tuberculosis, more educational initiatives may be beneficial. They strongly believe that volunteer initiatives, like awareness campaigns and Directly Observed Therapy, Short-Course (DOTS), are beneficial in the fight against tuberculosis.

According to demographic characteristics of volunteers, 58% of the volunteers are male and 42% of the volunteers are female, meaning that it is lower compared to male participation. 38% of volunteers are in the age group between 36 to 45 years old indicating that more mature adults are the most actively involved volunteers. Most volunteers (57%) have completed secondary education, indicating a moderately educated group.

Regarding occupational data of volunteers, most of the volunteers (70%) are involved in agriculture. It was found that 37% of volunteers have not received any training on tuberculosis yet and they can face some challenges in implementing TB control

efforts. Regarding the working years of volunteers, it is found that 72% of volunteers have less than 1 year of working experience.

According to the finding, volunteers believe they have ample time to provide DOT services, but accessibility may be hampered by the area's dearth of medical facilities. In spite of this, TB patients participate in DOTS activities to a moderate extent, and volunteers find it simple to arrange patient supervision visits. According to the study, there is a high degree of consensus among volunteers regarding the significant problems associated with adopting Directly Observed Treatment (DOT), with only minor diversity in their responses.

The finding shows that volunteers' effectiveness is impacted by a lack of community support and sufficient resources for TB Directly Observed Treatment (DOT). A widespread perception of inadequate resources, training, community support, and healthcare professionals' communication is indicated according to the findings. It is found that a moderate level of dedication and motivation, while the moderate response variability suggests varying perspectives among volunteers regarding their function.

Pearson Chi-Square tests between patients' education and their TB knowledge among the 200 TB patients shows a significant association between their education level and TB knowledge and finds that as education level increases, there is a consistent improvement in TB knowledge. It is found that most patients have no education, and it can impact on TB their TB knowledge according to chi-square tests showing strong association between their knowledge and education. Although community health volunteers are provided with health education on their home visits, lack of education is a barrier between those two barriers. According to Chi-Square tests between TB patients' education and their participation in Directly Observed Treatment Short-Course (DOTS) for 200 patients, there is no statistically significant association between TB patients' education levels and their participation in the DOTS program.

5.2. Suggestions

Based on the findings from the demographic characteristics of TB patients, dominant male participation suggests the need for gender-sensitive strategies to encourage equal participation in TB care and treatment. Creating awareness campaigns specifically aimed at women ensure to support in seeking TB care. It suggests developing educational initiatives that target younger individuals, using social media

or digital platforms to disseminate information about TB and its treatment as most patients in the age group between 18 to 25 years old. Encourage young people to become TB ambassadors in their communities, advocating for early detection, treatment adherence, and support for TB patients.

The study found that most TB patients have no formal education, and it is needed to form health literacy programs by developing simple, easy-to-understand educational materials on TB prevention, symptoms, and treatment, using visual aids and illustrations for those who cannot read. Organizing skill-building workshops aimed at improving basic literacy and vocational skills can enhance economic opportunities for TB patients. Informal education centers within the community where volunteers can teach basic literacy and numeracy skills need to be set up for empowering TB patients to better understand and follow treatment guidelines.

As most of patients working as farmers, it is suggested to do flexible treatment schedules by developing DOT programs that accommodate the farming community's schedule, considering their peak working hours and seasonal work demands. Agricultural Support Programs can provide support to TB-affected farmers by connecting them with resources and knowledge to improve their farming practices, which can reduce their economic burden while undergoing treatment. Farm-Based Health Outreach can be conducted by using community farms ensuring that TB information and services reach this key demographic in their workplace.

As some patients are Christian monks, it is suggested to engage religious leaders and use their influence in promoting health messages about TB prevention and the importance of adherence to treatment. Initiating faith-based health education programs that align with the community's values can make TB awareness more relatable and culturally appropriate. It is also suggested to encourage religious institutions to serve as community hubs to provide emotional support, guidance, and resources for TB patients.

Patients' comprehension of information about tuberculosis is moderate to somewhat favorable. Digital tools, community-based awareness campaigns, and interactive workshops can all be used to increase their comprehension. Treatment plans, side effects, and taking medications to the end can all be highlighted in patient-centered counseling. Support groups for peers might inspire others to adhere to treatment regimens. Patients can be motivated by encouraging words and success stories from other patients. Gaps in knowledge can be found through routine surveys or quizzes

measuring knowledge levels. To improve patient comprehension, use examples that are relevant to the patient's culture and language.

Based on the demographic characteristics of volunteers in the findings, implementing programs and campaigns can encourage female participation in volunteer activities, addressing any barriers they might face. It is suggested to share stories of successful female volunteers to inspire other women to join and emphasize the value of their contribution in health-related volunteering. Outreach strategies that target younger age groups can develop by promoting the benefits of volunteering and how it contributes to personal and professional development. Collaboration between younger and older volunteers encourages them to learn from each other's experiences and knowledge, thus creating a diverse and supportive team.

Easy-to-understand training, individualized encounters, and formal recognition programs can all encourage volunteers to stick with their commitment. All volunteers can benefit from workshops, skill-building activities, and on-the-job training to increase their knowledge and talents. Volunteers who are older and in better health can be encouraged to participate in wellness programs. Peer-to-peer learning can assist new volunteers in gaining self-assurance and useful skills. Volunteers can be kept on longer by giving them options for career growth and by acknowledging their achievements.

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APPENDIXES

QUESTIONNAIRE (FOR SURVEY TOOL)

SECTION A: PERSONAL INFORMATION for Both Volunteers and patients

1. Gender:

- Male
- Female
- Other (please specify)

2. Age:

- 18-25
- 26-35
- 36-45
- 46-55
- 56 and above

3. Educational Background:

- Primary
- Secondary
- Tertiary
- None

4. Occupation

- Farmer
- Own business
- Jobless
- Other (Specify)

SECTION B: QUESTIONNAIRE ON TB AWARENESS (For patients)

To what extent do you agree or disagree with the following statements? Tell us about your opinion on scale of (1) Strongly disagree (2) Disagree (3) Neither disagree nor agree (4) Agree (5) Strongly Agree. Please ✓ the column to enter your answer.

No.	Statement	1	2	3	4	5
	Section 1: General Knowledge about TB					
1	I am aware that tuberculosis (TB) is a serious health issue.					
2	I know that TB is caused by bacteria and not by poor hygiene or other factors.					
3	TB can be transmitted through the air when an infected person coughs or sneezes.					
4	I can identify the main symptoms of TB, such as a persistent cough, fever, and weight loss.					
5	I believe that TB affects both young and old people equally.					
	Section 2: TB Prevention					
6	I understand that TB can be prevented by avoiding close contact with infected individuals.					
7	Vaccination is an effective way to prevent TB.					
8	Maintaining good ventilation in homes helps reduce the risk of TB transmission.					
9	Covering your mouth when coughing or sneezing can prevent the spread of TB.					
10	It is important for people to wear masks in crowded places to prevent TB.					
	Section 3: TB Treatment					
11	I am aware that TB can be cured with proper treatment.					
12	TB treatment needs to be taken for a long period, typically 6 months or more.					
13	Stopping TB treatment before completion can make the disease harder to cure.					
14	If someone is diagnosed with TB, they should seek treatment at a hospital or clinic immediately.					

15	I know where to go for TB testing and treatment in my community.					
	Section 4: Attitudes toward TB					
16	I feel comfortable interacting with people who have TB.					
17	I believe that people with TB should be isolated from their families until they are cured.					
18	TB patients should not be stigmatized by the community					
19	If I suspect someone has TB, I encourage them to see a doctor					
20	People with TB can lead normal lives if they follow the treatment plan					
	Section 5: Information and Awareness					
21	I feel I have enough information about how TB is spread and how to prevent it.					
22	I have learned about TB from local health workers or community health programs.					
23	There is enough TB education and awareness in my village					
	Section 6: Perception on Volunteer Activities such as Awareness activity and DOTS					
24	Perception on contributing TB awareness raising sessions in the community by volunteers					
25	Perception on contributing DOTS activity in the community by volunteers					

SECTION C: QUESTIONNAIRE ON Trainings, working experiences and HE talks (For Volunteers)

5. How long have you been serving as a community health volunteer?

- Less than 1 year
- 1-3 years
- 3-5 years
- More than 5 years

6. What training have you received in tuberculosis care?
- Volunteer refresher training
 - No specific training on tuberculosis
7. How frequently do you talk about health education to the patients?
- Always
 - Sometimes
 - No talk

SECTION D: QUESTIONNAIRE ON ACCESS TO DIRECTLY OBSERVED TREATMENT (For volunteers)

To what extent do you agree or disagree with the following statements? Tell us your opinion on scale of (1) Strongly disagree (2) Disagree (3) Neither disagree nor agree (4) Agree (5) Strongly Agree. Please √ the column to enter your answer.

No.	Statement	1	2	3	4	5
Section 1: General Access to Directly Observed Treatment (DOT)						
1	The transportation system in my area allows me to reach TB patients for DOT easily.					
2	I have sufficient time in my daily schedule to provide DOT services to TB patients.					
3	TB patients in my area have easy access to the treatment center for DOT supervision.					
4	There are enough health facilities nearby where TB patients can receive DOT					
5	I can easily arrange my visits to observe TB patients take their medication					
6	The involvement of health volunteers improves community members' adherence to tuberculosis treatment.					
7	Patients are participated in DOTS activity conducted by volunteer.					
Section 2: Challenges in Accessing DOT						
8	I face difficulties in accessing some TB patients due to the long distances involved.					

9	The terrain or infrastructure (e.g., poor roads, lack of transportation) hinders my ability to provide DOT.					
10	Some TB patients do not comply with scheduled DOT visits, making access difficult.					
11	I feel that weather conditions (e.g., rain, heat) affect my ability to reach TB patients for DOT.					
12	Language or cultural barriers make it difficult for me to access and communicate with TB patients during DOT.					
Section 3: Support and Resources for Access to DOT						
13	I receive adequate support from healthcare professionals in accessing TB patients for DOT.					
14	I have the necessary resources (e.g., transportation, protective equipment) to effectively provide DOT to TB patients.					
15	I am well-trained in how to handle any challenges that arise during DOT supervision.					
16	I feel supported by the local community in carrying out DOT visits for TB patients.					
17	I receive timely updates and communication from healthcare professionals about any changes in the DOT procedures					
Section 4: Volunteer Motivation and Commitment						
18	I am motivated to continue providing DOT services despite the challenges I face.					
19	I believe my work as a DOT volunteer is making a significant impact on TB patients' treatment outcomes.					
20	I feel confident in my ability to ensure TB patients take their medication regularly through DOT.					
21	I feel recognized and appreciated for the work I do in providing DOT to TB patients.					
22	I am willing to continue working as a volunteer for TB patients as long as my support needs are met.					