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DISSERTATION ON

TUBERCULOSIS TREATMENT OUTCOMES USING TREATMENT SUPPORTERS IN KETU SOUTH MUNICIPALITY OF VOLTA REGION IN GHANA

BY

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(10395906)

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DECLARATION

I declare that this dissertation is the result of my own research work under the supervision of Professor E. A. Afari and where it is indebted to the work of others, I have made acknowledgement.

I also declare that this work has neither been accepted in substance for the award of another degree nor concurrently being submitted for the award of any other degree.

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DEDICATION

This study is dedicated to my daughter, Annabel Azagba, for her endurance throughout my study period.

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ABSTRACT

Introduction: The current global tuberculosis (TB) epidemic has put pressure on health care managers, especially those in the developing countries to seek innovative ways of delivering effective treatment to TB patients. One of the strategies employed is directly observed therapy for all patients where community members are used to supervise TB patients during the treatment regimen. Even though treatment supporters are used to improve the situation, proportion cured and completing treatment are still low. This study conducted in Ketu South municipality of the Volta region in Ghana on tuberculosis treatment outcomes using treatment supporters was to determine treatment supporter factors influencing treatment outcomes in the municipality.

Methods: The study was a cross sectional study, using quantitative method to collect data on 137 TB clients and their treatment supporters. Tuberculosis records were reviewed to determine the proportion of TB clients cured, completed treatment and defaulted after which a questionnaire was used to collect data from their treatment supporters. The data was analyzed using SPSS and Stata. Univariate, chi-squared and logistic regression analyses were done to determine proportions, differences and strengths of associations between the independent variables and the dependent variables

Results: Tuberculosis case detection for the municipality was 96.1% with a treatment success of 79.6%. Treatment outcome for cure, completion and treatment default were 66.7%, 81.9% and 20.4% respectively. It was realized that some treatment supporter factors influenced treatment cure of the TB clients. These factors include: age of treatment supporter

being older or younger than the TB client, marital status of the supporter, selection of the treatment supporter and treatment supporter's knowledge on TB.

Conclusions and Recommendations: Tuberculosis clients are more likely to be cured when they are supervised by people, who are older than them, married, have good knowledge on TB and are selected by the TB clients themselves. Financial challenge and time spent on supervising drug intake are the main challenges faced by the treatment supporters in Ketu South municipality. It is recommended that DHMT should make sure institutional coordinators, disease control officers and Community health nurses visit the treatment supporters regularly during the course of treatment National Tuberculosis control Programme (NTP) should provide enabler's package for treatment supporters.

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AFB	-	Acid-Fast Bacilli
DOT	-	Directly Observed Treatment
DOTS	-	Directly Observed Treatment Short-course
DTC	-	District Tuberculosis Coordinator
HIV	-	Human Immunodeficiency Virus
KSDHMT	-	Ketu South District Health Management Team
KSMHMT	-	Ketu South Municipal Health Management Team
LHWs	-	Lay Health Workers
M. TB	-	Mycobacterium Tuberculosis
MDR-TB	-	Multi-Drug Resistant TB
NTP	-	National Tuberculosis control Programme
PI	-	Principal Investigator
SSA	-	Sub-Saharan Africa
SSM	-	Sputum Smear Microscopy
TB	-	Tuberculosis
TC	-	Tuberculosis Client
TS	-	Treatment Supporter
VRHMT	-	Volta Regional Health Management Team
WHO	-	World Health Organization

DEFINITION OF TERMS

Close relative: in this study close relative refers to parent, spouse, sibling, son or daughter

Cured: A TB patient is considered cured when his or her diagnosis was based on Sputum Smear Microscopy (SSM), has completed a full course of anti-TB therapy and there is documented evidence of two negative sputum smears during the continuation phase, one of which must be at the end of treatment

Distant Relative: distant relative refers to uncle, aunty, niece, nephew, brother-in-law or sister-in-law

Knowledge on TB: Knowledge in the study was based on the following; 1. Signs and symptoms, 2. Mode of transmission, 3. Whether TB is Curable, 4. Preventive measures, 5. Duration of treatment, and 6. Aim of treatment

(5-6 = very good knowledge, 3-4 = Good knowledge, 1-2 = low knowledge, 0 = No knowledge)

Lay Health Workers: Health volunteers usually unemployed and based at their homes

Mycobacterium tuberculosis: causative agent for the disease tuberculosis

Pulmonary Tuberculosis: Tuberculosis affecting the lungs

Sputum Smear Microscopy: A method of diagnosing TB in which bacteria are observed in sputum samples examined under a microscope.

Treatment Completed: A patient who was notified as a definite case or sputum smear negative is considered as having completed treatment if the course of

treatment prescribed was completed and the patient was officially discharged by the attending physician or health staff.

Treatment Default: If the patient interrupts treatment for any reason, this is recorded as treatment default. To be classified as such, interruption of treatment should be for more than 2 months, non-completion of treatment within 9 months.

Treatment Supporter: Someone who supervises a TB client to take his or her drug.

Unmarried: it is made up of single, divorced, separated or widowed

CHAPTER ONE

INTRODUCTION

1.1 Background

Tuberculosis (TB) is an infectious disease caused by the bacillus Mycobacterium tuberculosis. TB can affect any part of the body but mostly the lungs where it is called pulmonary TB. When it affects other parts of the body, it is called extra-pulmonary TB. The disease spreads when people who are infected with pulmonary TB cough or sneeze thereby spreading the bacillus. A relatively small proportion of people infected with Mycobacterium tuberculosis ultimately develop the TB disease (WHO, 2012).

The commonest method for diagnosing TB worldwide is Sputum Smear Microscopy (SSM) (WHO, 2012). In a well equipped laboratory, SSM can diagnose about 60% of cases of pulmonary tuberculosis but in low-income countries where there is poor access to high-quality microscopy services lower proportion of Acid Fast Bacilli (AFB) is detected. At primary care level, in the absence of positive sputum smears for AFB, most cases of pulmonary tuberculosis are diagnosed on the basis of clinical and radiological indicators (Siddiqi, Lambert, & Walley, 2003).

Tuberculosis infects one-third of the global population and claims two million lives each year (Stewart, Robertson, & Young, 2003). Cobelens et al., (2008) indicates that Tuberculosis (TB) remains a significant global health problem responsible for an estimated 1.7 million deaths per year worldwide and the total estimated number of Multi-Drug Resistant Tuberculosis (MDR-TB) cases worldwide in 2006 was 489,139 (4.8% of all TB cases).

In Sub-Saharan Africa (SSA), the incidence of tuberculosis has increased about ten times even though the incidence has been falling in many parts of the world (Barker, 2008) and WHO, (2012) indicate that the African Region, which has the highest rates of TB cases and deaths contributes 24% of the world's cases.

According to 2011 TB annual report of Ghana, in the year 2010, the proportion of death among the TB client was 7.2% and treatment success was 85.5% with a defaulter proportion of 3.0% (Ghana NTP, 2013). A total number of 15,849 cases of TB were notified in the year 2011 and their outcomes are yet to be known.

Ketu South Municipality, for instance, reported 354 and 416 cases of TB in the year 2008 and 2009 respectively. Even though the number of cases came down to 315 in 2010, it went up to 397 cases in the year 2011 (KSDHMT, 2010, 2012).

There are various levels of intervention along the natural history of TB including prevention of the disease through vaccination, early diagnosis of infectious TB cases, rapid and effective delivery of anti-TB treatment including Directly Observed Treatment (DOT). DOT has been an effective tool on a mass basis and is being used successfully in over 180 countries worldwide, covering 69% of the world population (Kotokey, Bhattacharya, Das, Azad, & De, 2007; Lienhardt & Ogden, 2004)

Pablos-Méndez, Knirsch, Barr, Lerner, & Frieden, (1997) indicate that in the absence of public health intervention, half of TB patients default treatment for two months or longer and non-adherence may contribute to the spread of tuberculosis and the emergence of drug resistance, which may increase the cost of treatment.

1.2 Statement of the Problem

The current global tuberculosis (TB) epidemic has put pressure on health care managers, especially those in the developing countries to seek innovative ways of delivering effective treatment to TB patients. One of the strategies employed is DOT for all patients where community members are used to supervise TB patients during the TB treatment regimen (Kironde & Bajunirwe, 2003).

Even though treatment supporters are used to improve the situation, the proportion cured and completing treatment is still low. The proportion of TB patients completing treatment has been below 15% from 2004 to 2010 in the Volta region (VRHMT, 2012). Volta region recorded 73.8% cured in the year 2010 and Ketu south also recorded 78.7% cured in the year 2011 (KSMHMT, 2013a). These proportions cured were less than WHO target of at least 85% (Mafigiri, McGrath, & Whalen, 2012) and regional target of 90% (VRHMT, 2012)

The treatment supporter factors influencing the duration of support for TB client leading to cure and completion of treatment include background characteristics such as age, level of education, occupation etc, motivation, selection of the treatment supporters. Others are knowledge on TB and challenges.

If the factors influencing treatment outcomes using treatment supporters are identified and addressed, treatment outcomes in the Ketu South Municipality where community based DOT strategy is being practiced could improve.

1.3 Justification

Treatment supporters play an important role in preventing defaulting which eventually leads to development of Multi-Drug Resistant TB (MDR-TB). The findings from this study will help improve TB patient care management through the following:

i. Identifying the type of treatment supporters to select for the DOT strategy to support TB clients during the period of medication.

ii. Help facilities in Ketu South municipality to improve upon the TB management by addressing the challenges in the work of treatment supporters.

iii. The Volta Regional Health Directorate may use the findings to improve service delivery and in turn increase the proportion of the cured, completed and also to prevent treatment default.

iv. This research will also add to existing knowledge on the use of treatment supporters in TB-DOTS strategy.

1.4 Conceptual Framework

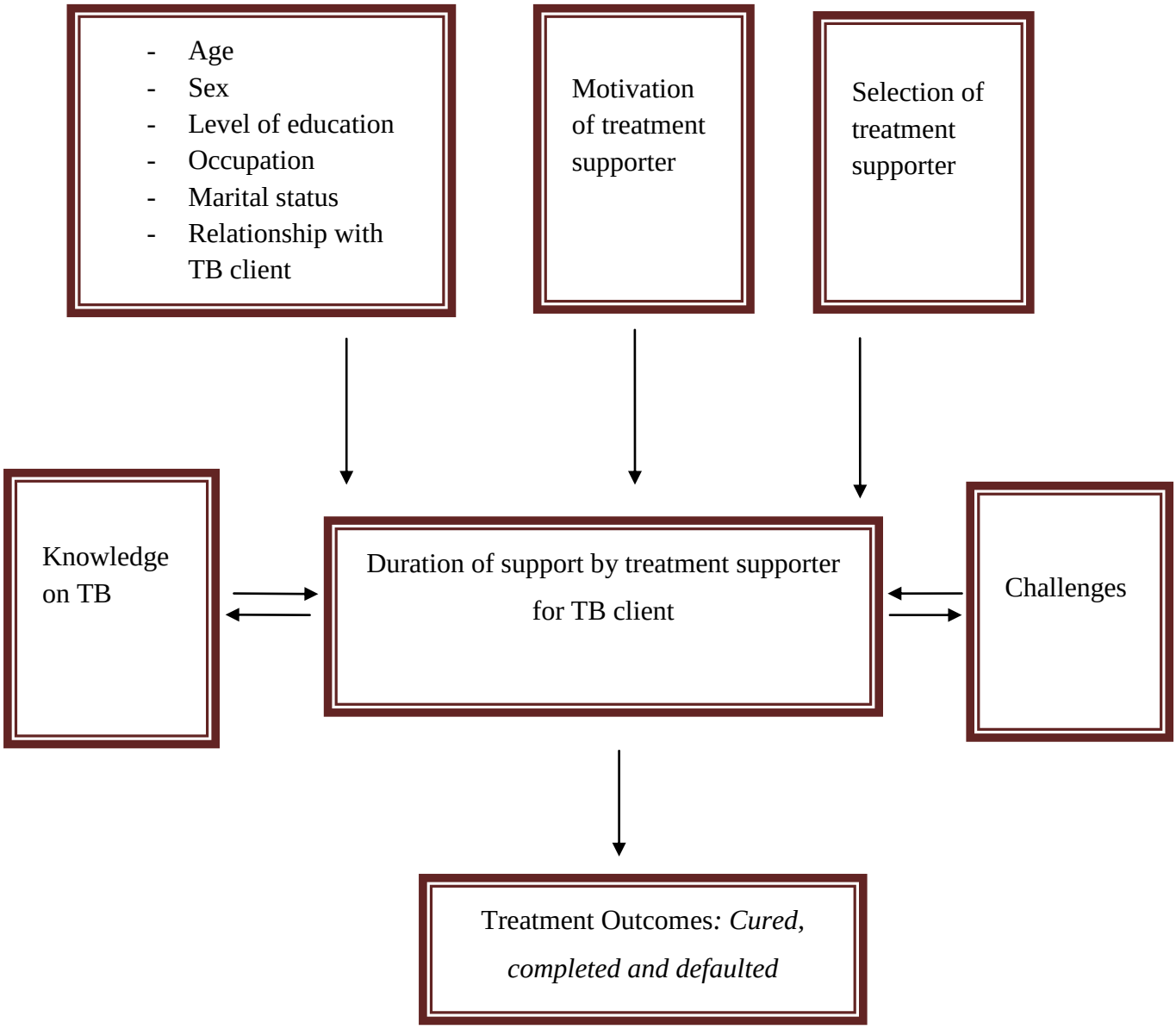

Fig.1. Conceptual Framework on TB Treatment Supporter Factors Influencing Treatment Outcomes

Figure 1 is a conceptual framework illustrating TB treatment outcomes in relation to treatment supporter factors through duration of support by the supporters. The factors influencing the

duration of support have been divided into five components which are: the supporter's background characteristics such as age, level of education, occupation etc, motivation, selection of the treatment supporter, knowledge on TB and challenges. Depending on the supporter's background characteristics such as occupation, he or she may be able to support the client throughout the six months of treatment or less. If the supporter is motivated in one way or the other, he or she provides support for the six months. On the selection of the supporter, if the TB client picks a supporter himself or herself the support may be successful. The other two are knowledge on TB and challenges which can affect the support or may occur as a result of the support given to the client. The duration of support will in turn affect the client being cured of the disease, completing the treatment or defaulting as shown in the diagram.

1.5 OBJECTIVES

1.5.1 General Objective

To assess TB treatment outcomes among adults with treatment supporters registered in the year 2011

1.5.2 Specific Objectives:

1. To determine proportion of B clients with treatment supporters who were cured

2. To determine proportion of TB clients with treatment supporters completing treatment

3. To determine proportion of TB clients with treatment supporters defaulting

4. To identify treatment supporter factors influencing treatment outcomes

CHAPTER TWO

LITERATURE REVIEW

2.1 Tuberculosis Cure, Completion and Defaulter rates (proportions)

Chanda & Gosnell, (2006) indicate in their work that the goal of tuberculosis programme include a case detection of 70% and a cure of 85% worldwide. The case detection in Zambia stands at 81% and the cure at 75%.

The World Health Organization (WHO) indicates that about 30 million people have been treated with the five-elements of DOTS resulting in a cure of more than 80% and less than 10% default (Frieden & Sbarbaro, 2007).

In a study conducted in South Africa, it was estimated at the pre-intervention phase that the treatment completed for all (503) cases were 61% and that for new smear positive cases was put at 67%. However, the successful outcome for new smear positive cases was 82% for decentralized clinic and 88% for those who lived in the district but attended the hospital for treatment (Edginton, 1999).

Ali, (2008), indicates that most of the treatment supporters were collecting TB drug for their client monthly and were giving it to the clients daily. He also indicates that out of 71 clients under direct supervision of treatment supporters, 61 completed their treatment

In the work of Franke et al. (2008), 10% of 671 Multi-Drug Resistant (MDR) TB clients defaulted during their treatment.

It is indicated in a work done in Russia by Gelmanova et al., (2007) that 8.8% of TB clients included in a cohort study, defaulted.

2.2 Demographic Factors of Treatment Supporters

Egwaga et al., (2009), indicated that the concept of using family members as treatment supporters is controversial within the TB DOTS system because WHO treatment guidelines state that family members in general should not be considered as treatment supporters but however, in the updated guidelines on community involvement in TB care, it was stated that there is a need to provide an increased range of treatment support options.

In a study by Colvin, Gumede, Grimwade, Maher, & Wilkinson, (2003), traditional healers were used as treatment supporters and compared treatment outcome of their clients to the clients of the other group made up of community health workers and lay persons in the community. There was significant difference in outcome between those supervised by traditional healers and the other group made up of community health workers and lay persons even though the outcome for those supervised by traditional healers was 88% and that of the other group was 75%.

Treatment supporters are people living close to TB patients since they must be accessible to patients and Lay Health Workers (LHWs) who are usually unemployed and are based in their homes are those used (Dick, Murray, & Botha, 2005).

Wandwalo, Makundi, Hasler, & Morkve (2006), state in their study that treatment supporter was either a guardian (family member or a close relative living together with the patient) or a former TB patient.

A TB client indicated that it is important to have someone to support you in your treatment and he had his sister and ex-girlfriend who supported him during his treatment (Munro et al., 2007). Munro et al. also indicated that religion could influence adherence to treatment.

A study by Egwaga et al., (2009) in Tanzania did not identify any supporter characteristic that influenced the achievement of cure or treatment success in patients who had their treatment

observed at home. Egwaga et al., (2009) again indicates that from previous studies it is known that DOT by lay men is feasible and can result in good treatment outcomes and also showed that in Nepal DOT by family members obtained success rates that met the international target of 85%.

Anuwatnonthakate et al., (2008) found out in Thailand that having a treatment observer during treatment reduces defaulting and that treatment success among patients with family supporters were the same as those with health workers as supporters. It was found out that the proportion of the cured recorded among TB clients supported by family members was 55%. When female Health Workers were used in DOT programme as treatment supervisors, 69.6% of their clients completed treatment, 58.8% declared cured and 19.6% defaulted. They also indicate that at least two months of DOT results in improved outcomes while marital status and level of education did not have any effect on the treatment.

In a study carried out in south Africa, it was realized that TB patients with male treatment supporters recorded poor treatment outcomes (Barker, Millard, & Nthangeni, 2002).

Ali, (2008) indicates in his study that the overall performance by Lay Health Workers (LHWs) as treatment supporters aged 41-50 years was better than other groups. There was no statistical difference in terms of; marital status and education of treatment supporters.

Dudley et al., (2003), conclude in their study that supervision done by Community Health Worker contributed to better outcome than an approach based exclusively on health facilities hence the support for lay health worker programmes in TB control is needed.

It was found out in Thailand that DOT using health care workers had positive outcomes on treatment than using family members even though both were beneficial than self administered treatment (Anuwatnonthakate et al., 2008).

It was realized that patients who selected family members to serve as their treatment supporters recorded a high cure rate and less defaulter rate than those who selected health workers as their treatment supporters. They therefore conclude that family members can be effective treatment observers (Frieden & Sbarbaro, 2007).

2.3 Selection of Treatment Supporters

Patient-centred approach of treatment enables the patients to choose a supervision model which will not affect their daily life and this could have a positive effect on treatment adherence (Egwaga et al., 2009)

From a study in Tanzania, it was concluded that transferring the DOT from the health facility to the patient's home and the observer changed from a health-care worker to a supporter of choice will yield a good result (Egwaga et al., 2009).

In a study carried out in Swaziland, TB patients were allowed to choose their treatment supporters in consultation with a nurse. They either chose a family member or a community health worker as the treatment observer (Escott & Walley, 2005).

Wandwalo et al., (2006) states that patients did the selection of treatment supporters but were assisted by a health staff in the selection of a responsible and trusted guardian. In the same study District Tuberculosis Coordinators (DTC) also selected former TB patients who successfully

completed their treatment and are living close to the TB patient's home and are also willing to be treatment supporters for some of the TB patients.

TB Patients who opted for home-based treatment were asked to return to the facility with treatment supporter of their choice. These supporters were given instructions by the health care provider on the importance of daily supervision of drug intake, the signs and symptoms of side-effects, and what to do if they occur as well as frequency of drug collection (Egwaga et al., 2009).

In the work of Frieden & Sbarbaro, (2007) in Senegal, it is indicated that patients selected their own treatment supporters and there was no option for self administration. These treatment supporters must be someone who is accessible and acceptable to the TB clients and accountable to the health system

Egwaga et al., (2009) report that there were no specific prerequisites for the supporter chosen by the patient. They indicated that patient-centred approach in which patients selected their own treatment supporter showed a better treatment success than health facility DOT.

In a research conducted in South Africa, it was found out that the patients and health care workers identified individuals who were usually mothers, children, siblings or spouses who had moral authority with them and could influence the client's health decision making to serve as treatment supporter (Nachega et al., 2006).

2.4 Tuberculosis Treatment Supporters' Knowledge on TB

WHO emphasized that patients should be observed to swallow every dose of their TB treatment directly and this technique has been adopted by the national tuberculosis programmes in many countries in the world as part of stop-TB strategy (Barker, 2008).

With reference to WHO, (2012), treatment for new cases of drug susceptible TB consists of a six-month regimen. The WHO recommends that observation of treatment should be throughout the six months of treatment regimen (Egwaga et al., 2009).

The change from facility based treatment to patient-centred treatment maintains the core principle of daily observation of treatment for the full duration of treatment (Egwaga et al., 2009).

According to Wandwalo et al., (2006), treatment supporters supervised TB patients during the two months intensive period after which patients took the drug on their own.

It is the responsibility of the treatment supporter to visit the TB client in his or her house but in some cases the client rather has to walk to the supporter's house which makes it difficult for patients with severe symptoms (Munro et al., 2007).

Ali, (2008), indicates in a study that most of the treatment supporters were collecting TB drug for their client monthly and were giving it to the clients daily. It is also indicated that out of 71 clients under direct supervision of treatment supporters, 61 completed their treatment

The goal of tuberculosis treatment is to control the tuberculosis symptoms and also to prevent transmission from infected persons to other people (Chanda & Gosnell, 2006). They also indicate that the duration of treatment in Zambia has been shortened from 18 months to 8 months.

2.5 Motivation of Treatment Supporters

Treatment supporters are trained on their role as treatment observers with emphasis on observing drug taking and encouraging patients to complete treatment as well as record keeping (Wandwalo, Makundi, Hasler, & Morkve 2006).

In the work of Wandwalo et al., (2006), during the intensive phase of treatment health workers make surprise visits to patients' homes to check for treatment adherence by reviewing treatment cards and also counting the pills.

Wandwalo et al (2006) also found out in Tanzania that majority (80%) of the TB clients were willing to supervise another TB patient as a result of having personal experience of the disease and would like to help another patient. Others who formed 13% were willing to supervise the patients in order to reduce the burden of TB in the community. The rest 7% were willing to supervise only family members. The majority of the treatment supporters (91%) were willing to supervise treatment of another TB patient. They indicated that married treatment supporters were more likely to agree to supervise the patients than unmarried treatment supporters and no other socio-demographic factor predicted willingness to supervise again, apart from being married. Most of those who were unwilling to supervise another patient were either brothers or sisters of the patients. While most (82%) of treatment supporters were willing to supervise again because of humanitarian reasons, 18% were willing because they are duty bound.

Some other motivations were that most treatment supporters would like health workers to visit them more frequently in the community. For former TB patients the main motivation was to encourage other TB patients that the disease is indeed curable and they felt they could convince

patients to complete medication and reduce stigma of the disease in the community (Wandwalo et al., 2006).

To ensure compliance with the long period of TB treatment, there is the need for services such as close supervision and patient support (Chanda & Gosnell, 2006)

A study by Barker, Millard, & Nthangeni, (2002) in South Africa, indicates that TB patients supervised by unpaid community volunteers recorded a better treatment outcome compared to those supervised by professional health workers.

It is indicated in the work of Frontières, (2004), that a DOTS supporter believed that DOTS is the most realistic approach and was an improvement on low cure rates recorded in the non DOTS strategy.

Hadley & Maher, (2000), show that community members support TB patients psychologically and logistically in order for them to complete their treatment.

In a community based DOT programme in which the supporters were given a financial reward, the patients had success rate of 85% and those without financial reward recorded 77.6% but this was not statistically significant (Kangovi, Mukherjee, Bohmer, & Fitzmaurice, 2009)

2.6 Challenges in the work and use of treatment supporters

It was identified in Tanzania that the main problem encountered in the use of treatment supporters was the need for incentives expressed by the supporters (Egwaga et al., 2009).

Among challenges to adherence to TB treatment were inappropriate support from health workers, duration of treatment, social isolation, lack of family support and the perception of feeling better midway of treatment therefore assuming full recovery (Frontières, 2011).

Lienhardt & Ogden, (2004**),** indicate in their study that they received multiple reports showing that TB programmers are using various interventions to improve adherence but most of the interventions depend on external funding.

According to Wandwalo, Makundi, Hasler, & Morkve, (2006), the main challenge in the use of treatment supporters was effective supervision and monitoring of treatment supporters in the community.

It was indicated that patients who spent less on travel and treatment had better treatment outcome than their counterparts (Wei, Liang, Liu, Walley, & Dong, 2008)

One of the barriers that could lead to patients default is the type of labour that takes the patient out of their area (Squire 2008).

In the work of Munro et al., (2007), some patients stop taking TB medication when they feel better or do not have signs and symptoms of the disease coupled with the terrible side effects of the drug. Other reasons were not having money to go for the drug, drinking, which makes them not to visit the health facility and also interrupts treatment instead of discarding drinking habit. One other challenge is the time needed to be present for direct observation of drug taking compromised their ability to attend to other daily tasks.

In a study carried out in Kenya, TB patients traveling outside the treatment centre, feeling better and alcohol abuse were some of the factors contributing to patients defaulting during tuberculosis treatment (Muture et al., 2011).

It is shown in the work of Chanda & Gosnell, (2006) that family roles are often disturbed due to chronic nature of tuberculosis, the prolonged treatment protocol and frequent nature of treatment (drug taking).

Daily collection of drug was seen as a challenge irrespective of the distance needed to travel to the health facility (Egwaga et al., 2008)

CHAPTER THREE

METHODS

3.1 Type of Study

The study was a descriptive cross-sectional study using quantitative method to collect data. Record was reviewed for TB clients registered in the year 2011 using checklist and their treatment supporters interviewed using questionnaire. Univariate, chi-squared and logistic regression analyses were done to determine proportions, differences and strength of associations between the independent variables and the dependent variables.

3.2 Study Location/ Area

The study was conducted in Ketu South Municipality of Volta Region which lies in the south-east part of Ghana. Ketu South is bounded in the north by Ketu North District, in the west by Ketu North and Keta Municipal, in the south by Gulf of Guinea and in the east by Republic of Togo. The 2013 population of the municipality is 173,117 projected from the year 2010 census (KSMHMT, 2013b).

The municipality has been further divided into six sub-municipalities namely; Aflao East, Aflao Wego, Aflao West, Klikor, Some Fugo and Some Wego. The health facilities in the municipality include; three hospitals (one government and two private), three private clinics, six government health centres and twent-four functioning CHPS zones (KSMHMT, 2013b).

Malaria, Acute Respiratory Tract Infections (ARTI) and hypertension have been the first, second and third respectively among the top ten diseases in the municipality for three consecutive years (2010 to 2012). The table below shows the trend of the top ten diseases in the municipality from 2010 to 2012.

Table 1. The Top Ten Diseases in Ketu South Municipality from 2010 to 2012

No	DISEASE	2010	DISEASE	2011	DISEASE	2012
1	Malaria	30397	Malaria	32623	Malaria	29815
2	A RTI	6988	A RTI	9967	A RTI	10187
3	Hypertension	4859	Hypertension	5054	Hypertension	4009
4	Anaemia	4719	Anaemia	4253	Rheumatic & joint pain	3852
5	Rheumatic & joint Pain	2886	Rheumatic & joint Pain	3729	Anaemia	3548
6	Intestinal worm.	2226	Skins disease/ulcers	2959	Diarrhoea diseases	2753
7	Diarrhoea diseases	2184	Intestinal worm.	2423	Skin diseases/ ulcers	2678
8	Skin diseases/ ulcers	1845	Diarrhoea diseases	2377	Intestinal worm.	1963
9	Pregnancy Related Complications	970	Diabetes mellitus	957	Diabetes mellitus	742
10	Diabetes mellitus	925	Pregnancy Related Complications	705	Tuberculosis	395

Source: (KSMHMT, 2013a)

The municipality which records the highest number (about 25%) of TB cases in the Volta region and also having TB to be among the top ten diseases in the years 2012 has three TB diagnostic centres namely Ketu South Municipal Hospital, Central Aflao Hospital and New Hope Clinic Limited. TB cases that reported at these three centres in the year 2011 and their treatment supporters who reside in the Ketu South Municipality were used for the study. Below is the map of the study site.

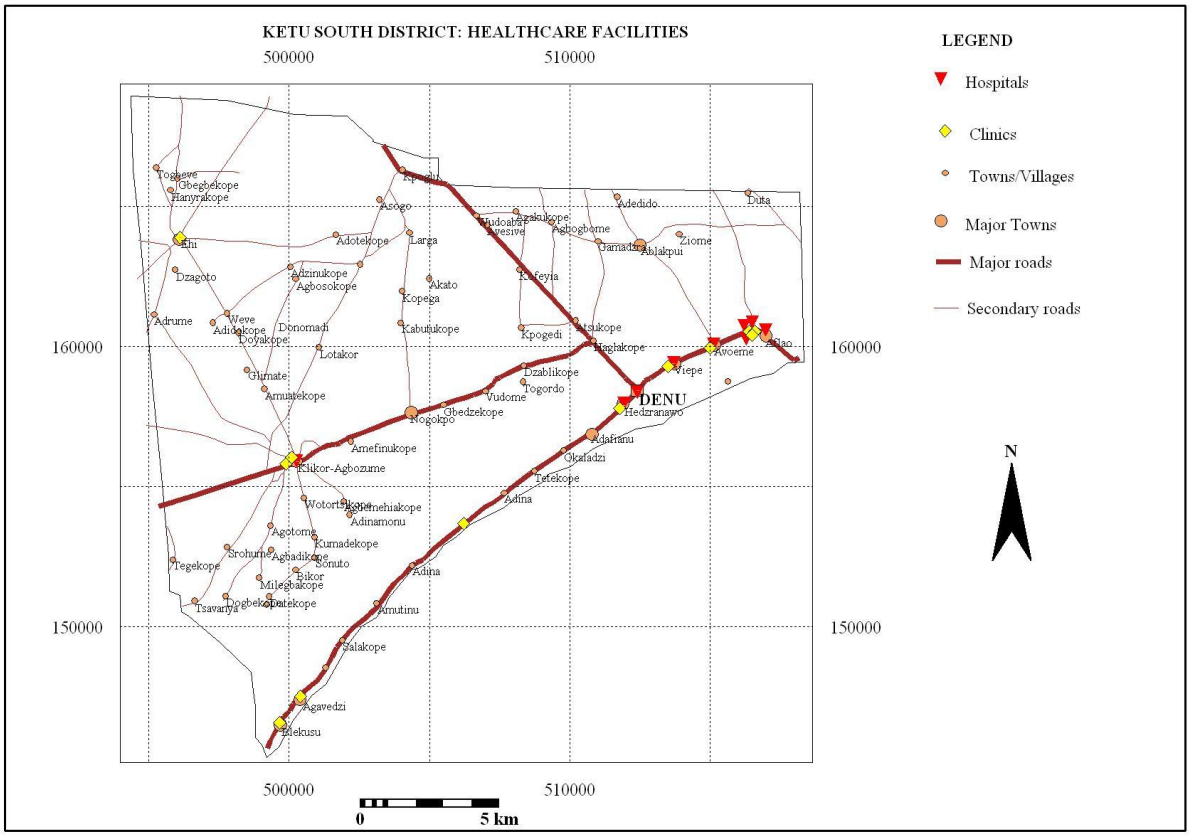

Fig. 2. Map of Ketu South Municipality (Ketu South Municipal Assembly, 2013).

3.3 Variables

The independent variables in the study include background characteristics (age, sex, educational status, marital status, occupation and relationship of treatment supporter to TB client), selection of treatment supporter, motivation of treatment supporter, knowledge on TB and challenges. The dependent variables were made up of the cured, completed and defaulted

3.4 Study Population

The study population was new TB clients aged 15 years and above put on treatment in the year 2011 and their treatment supporters. They were people registered and resident in Ketu South Municipality who finished their course of treatment in the year 2012.

3.5 Sample Size and Sampling Method

All TB clients and their treatment supporters were used for the study. The municipality recorded 341 adult TB clients in the year 2011. Out of the 341 adult TB clients, 218 had treatment supporters who were residents in Ketu South municipality and 137 of them were used in the study. The rest 82 could not be traced due to wrong addresses, death and migration from their community.

A list of all TB treatment supporters was generated from record review with a unique number which was linked to the TB clients they supported.

3.6 Data Collection Techniques and Tools

A checklist was used to extract data from tuberculosis records (TB folders) at the three DOT centres in the municipality for the TB clients. A structured questionnaire was then used to interview their treatment supporters. The respondents (treatment supporters) were traced to their homes through their addresses or phone numbers from the TB register or contacted through the TB clients and verbal informed consent obtained from them before the administration of the questionnaire.

Lists of relevant questions needed to meet the study objectives formed the basis for the questionnaire. This guided the direction of the questions and ensured that all the relevant information was obtained. The questionnaire which was divided into sections had questions that were mainly close ended.

3.7 Quality Control

The following measures were put in place to ensure that the data collected was of quality:

a. Five research assistants were recruited and trained to assist in data collection for the study.

b. Researcher supervised the collection of the data.

c. Researcher also took part in the record review and interviewed some of the treatment supporters in order to cross check the work of the research assistants.

d. Each day, data was checked to ensure that all information was properly filled and errors and omissions detected discussed with the research assistants. Research assistants then made follow-ups and did the necessary corrections.

e. The questionnaire was pre-tested to ensure that the data collection tool is validated and research assistants conversant with the tool before the actual data collection.

f. Data was double entered into to ensure that data was entered correctly.

3.8 Data Processing and Analysis

3.8.1 Statistical Methods

The outcome variables in the study were cured, completed and defaulted. All adult TB clients registered in the year 2011 who are resident in Ketu South Municipality and had treatment supporters that could be traced and interviewed were included in the analysis.

SPSS version 16 and stata version 11 were used for data entry and analysis. Data was double entered into SPSS, cleaned and exported into stata for analysis.

Univariate analysis was used to determine the proportion cured, completed and defaulted in general and in relation to demographic characteristics among TB clients. The proportion cured, completed and defaulted were also determined in relation to treatment supporter characteristics.

Bivariate analysis was used to determine differences between supporter factors which were background characteristics like age, sex, selection of treatment supporter, treatment supporter's relationship to the TB client etc in relation to treatment outcomes.

Logistic regression was also used to investigate treatment supporter factors that are associated with treatment outcome (cured). First the association between cured, completed and defaulted with each supporter factor in the study was examined ignoring all other variables to get those variables that are related to dependent variables. Each variable was a candidate for inclusion in logistic regression analysis, provided the P-value was less than 0.05.

Age was categorized into 15-24, 25-34, 35-44, 45-54, 55-64 and ≥65 for the description of background characteristics of TB clients and their treatment supporters. Some of the treatment supporter characteristics were categorized: age was categorized into those who are younger and older than TB client they supported; Marital status was categorized into married and unmarried; Knowledge has been categorized into no knowledge, low knowledge, good knowledge and very good knowledge - Treatment supporters were considered to have very good knowledge if they answered five to six questions under knowledge in the questionnaire correctly, good knowledge if they answered three to four questions correctly, low knowledge if one to two questions were answered correctly and no knowledge if none of the questions under knowledge was answered correctly; occupation categorized into employed and unemployed where employed consisted of self employed, governmental or non-governmental employed. Other categorization done were: Motivation into those who were motivated (had reasons for supporting their client or paid for supporting the TB client) and not motivated (no reason given or not paid for supporting their clients) and challenges into no challenge or had challenge.

3.9 Ethical Consideration/ Issues

The study was approved by Ethical Review Committee of Ghana Health Service, Research and Development Division in Accra.

Permission was obtained from Ketu South Municipal Health Directorate to undertake the study in the municipality.

The study participants were people who supported TB clients in their course of treatment in the year 2011. There was neither risk nor benefit for participants involved in the study and there was no compensation for participants participating in the study.

A verbal informed consent was obtained from the individual respondents (treatment supporters) before interviewing them. The participants were assured of confidentiality regarding the information that was gathered from the interview and data from the study would be kept under lock and key accessible to only the principal investigator and the supervisors.

The institutional coordinators at the three DOTS centres in the municipality were assured of confidentiality regarding data collected through record review on the TB clients.

The researcher or principal investigator has no conflict of interest so far as this study is concern.

3.10 Pretest or Pilot Study

The checklist for record review and questionnaire for interview was pre-tested in Ketu North district, a neighbouring district with similar characteristics as Ketu South. The pretest helped the researcher to make the necessary corrections before the actual data collection. It also helped the research assistants to be conversant with the tool before the actual data collection for the study. The pilot study again helped in the standardization of data collection by research assistants.

CHAPTER FOUR

RESULTS

4.1 Background Characteristics of TB Clients with Treatment Supporters in Ketu South Municipality

A record was reviewed for 341 TB clients recorded in the year 2011 in the Ketu South Municipality. This was made up of 218 clients with treatment supporters residing in the municipality, 82 TB clients without treatment supporters or residing outside the municipality and 41 from Republic of Togo. Treatment supporters of 81 TB clients out of the 218 who qualified to be included in the study could not be interviewed due to either wrong addresses or migration from the community.

A total of 137 TB cases aged between 15 and 65 years old were used for the study. Their mean age was 43.4 years old with standard deviation of $\pm$ 15.1. The cases were made up of 21 pulmonary positive TB cases and 116 pulmonary negative TB cases. Males in the study were 76 and females were 61 (table 2). 108 (78.8%) of the TB clients used for the study were from Municipal Hospital, 21 (15.3%) from Central Aflao Hospital (CAH) and 8 (5.8%) from New Hope Clinic. The 137 cases came from the six sub-municipalities in the municipal. The distribution of the cases was: Aflao West, 48 (35.0%); Some Fugo, 29 (21.2%); Aflao Wego, 24 (17.5%); Aflao East, 19 (13.9%); Some Wego, 9 (6.6%) and Klikor, 8 (5.8%).

Majority, 87 (63.5%) of the TB clients used in the study aged above 35 years with the highest proportion (27.7%) of them aged above 55 years and the lowest proportion (11.7%) of them fell within the age group of 46-55 (table 2). 108 (78.8%) of the clients were supervised for at least two months. Table 2 shows characteristics of the 137 TB clients used in the study.

Table 2. Background Characteristics of TB clients with Treatment Supporters in Ketu South Municipality in 2011

Variable	All TB Client = 137	
Age group	**Number**	**%**
15 – 25	17	12.4
26 – 35	33	24.1
36 – 45	33	24.1
46 – 55	16	11.7
Above 55	38	27.7
Sex		
Male	76	55.5
Female	61	45.5
Duration of Support		
Less than 2 months	29	21.2
2 to less than 4 months	45	32.9
4 to 6 months	63	45.9

4.2 Background Characteristics of TB Treatment Supporters in Ketu South Municipality

A total of 137 TB treatment supporters aged between 19 and 74 years old were interviewed and used for the study. Their mean age was 42.8 years old with standard deviation of $\pm$ 13.6. Treatment supporters who aged younger than their clients were 75 (54.7%). Females formed 84 (61.3%) of the treatment supporters (table 3). Treatment supporters used were Christians, Traditionalists or Muslims and Christians were 97 (70.0%) of the respondents (table 3). Treatment supporters who had some level of education were 105 (76.6%), those who were unmarried formed 42 (30.7%) of the respondents and the unemployed were 21 (15.3%). Table 3 shows background characteristics of the treatment supporters in Ketu South Municipality.

Table 3. Background Characteristics of TB Treatment Supporters in Ketu South Municipality in 2011

Variable	Treatment Supporters: Total = 137	
Age group	**Number**	**%**
< or = 25	16	11.7
26 – 35	29	21.2
36 – 45	37	27.0
46 – 55	31	22.6
Above 55	24	17.5
Sex		
Male	53	38.7
Female	84	61.3
Religion		
Christian	97	70.8
Muslim	4	2.9
Traditional	36	26.3
Level of education		
None	32	23.4
Primary /JHS	72	52.5
SHS	24	17.5
Tertiary	9	6.6
Occupation		
Unemployed	21	15.3
Self employed/ informal	101	73.7
Government employee	15	11.0
Marital Status		
Single	21	15.3
Married	95	69.3
Divorced/ separated	6	4.4
Widowed	15	11.0

4.3 Proportion of TB Client with Treatment Supporters Cured, Completed and Defaulted Treatment in Ketu South Municipality

Tuberculosis case detection for the municipality was 96.1% in the year 2011. The treatment success for the tuberculosis clients with treatment supporters used in the study was 79.6%. The total number of cases used in the analysis was 137 with 21 (15.3%) being pulmonary positive cases and pulmonary negative cases were 116 (84.7%). The pulmonary positive TB clients with treatment supporters cured were 14 (66.7%) and all the clients aged between 26 and 35 were cured, 9 (75.0%) cured for males clients (table 4) and all the clients supported for at least two months were cured.

The total number of TB clients that completed treatment was 95 (81.9%). The proportion of the TB clients completing treatment among the various age groups were more than 80% except those aged above 55 years which was 73.3% (table 4). The number of males who completed treatment were 57 (89.1%) and that of females were 38 (73.1%). 56 (98.3%) of the client supervised for at least four months completed treatment.

The TB clients with treatment supporters who default treatment were 28 (20.4%). The age group with the highest number 12 (31.6%) of defaulters was those above 55 years and those with the least 4 (12.1%) proportion was 26-35 years (table 4). Males recorded a lower proportion of defaulters than their female counterparts and only 1 (1.6%) of the clients supervised for at least four months defaulted (table 4).

Table 4. Proportion of TB Clients with Treatment Supporters Cured, Completed and Defaulted in Ketu South Municipality in 2011

Variable	***All TB clients n=137 (%)	*Positive n=21(%)	**Negative n=116(%)	*Cured n=14(%)	**Completed n=95(%)	***Defaulted n=28(%)
Age group						
15 – 25	17 (12.4)	0	17 (14.7)	0	14 (82.4)	3 (17.6)
26 – 35	33 (24.1)	6 (28.5)	27 (23.3)	6 (100)	23 (85.2)	4 (12.1)
36 – 45	33 (24.1)	3 (14.3)	30 (25.9)	2 (66.7)	26 (86.7)	5 (15.2)
46 – 55	16 (11.7)	4 (19.0)	12 (10.3)	2 (50.0)	10 (83.3)	4 (25.0)
Above 55	38 (27.7)	8 (38.1)	30 (25.9)	4 (50.0)	22 (73.3)	12 (31.6)
Sex						
Male	76(55.5)	12 (57.1)	64 (55.2)	9 (75.0)	57 (89.1)	10 (10.9)
Female	61(45.5)	9 (42.9)	52 (44.8)	5 (55.6)	38 (73.1)	18 (29.5)
Duration of Support						
< 2 months	29 (21.2)	8 (38.1)	21 (18.1)	1 (12.5)	4 (19.1)	24 (82.8)
2- <4 months	45 (32.9)	7 (33.3)	38 (32.8)	7 (100)	35 (92.1)	3 (6.7)
4-6 months	63 (45.9)	6 (28.6)	57 (49.1)	6(100)	56 (98.3)	1 (1.6)

NB: * Positive cases served as denominator for the proportion cured. ** Negative cases served as denominator for proportion completing treatment. ***All TB clients served as denominator for proportion that defaulted.

4.4 Treatment Supporter Factors in Relation to treatment cured for TB cases in Ketu South Municipality

The proportions cured among all the independent variables were determined and chi-squared done to determine whether the factor is significant or not. A factor is considered significant if the P-Value is less than 0.05. All the TB clients 6 (100%) supervised by supporters older than them were cured compared to 8 (53.3%) cured for those supervised by supporters younger than them

and this difference is significant (χ^2 = 4.20; P = 0.04) (table 5). The proportion of TB clients cured among those supervised by both male and female treatment supporters were the same (66.7%). Religion and educational background did not influence treatment cured of TB clients. Neither religion nor educational background of treatment supporters influenced the cure of the TB clients. Religion was (χ^2 = 1.97; P = 0.373) and educational level (χ^2 = 4.21; P = 0.240) (table 4). All the clients (2) supervised by widowed treatment supervisors were cured, the one supervised by divorced treatment supporter was not cured. Only 1 (20%) of Single supervisor's clients was cured. Clients supervised by married treatment supporters had 11 (84.6%) cured compared to those supervised by unmarried supporters with 3 (37.5%) cured and this is significant (χ^2 = 4.95; P = 0.026).

Occupation of the treatment supporters did not show any significance on cure of the TB clients (χ^2 = 0.15; P = 0.694), even though employed had 11 (64.7%) as against 3 (75%) for unemployed cured. The cured among TB clients who selected their own treatment supporters was 13 (81.3%) while that of those whose treatment supporters were selected for them by the health workers was 1 (20.0%). The difference is significant (χ^2 = 6.43; P = 0.011). Treatment supporter relationship with TB client did not show any significance (χ^2 = 0.53; P = 0.469).

Knowledge on TB by treatment supporters seems to increase with proportion cured. Those with low knowledge was zero had zero (0), good knowledge had 2 (33.3%) and those with very good knowledge had 12 (85.7%) cured (χ^2 = 7.29; P = 0.026). Those who said TB is curable had 14 (77.8%) of their clients cured and none of the clients of those who said TB is not curable was cured which is significant (χ^2 = 7.00; P = 0.030). Motivation (χ^2 = 0.53; P = 0.469) and challenges (χ^2 = 3.80; P = 0.284) did not have any influence on cure.

Table 5. Treatment Supporter Factors in Relation to Treatment cured for TB cases in Ketu South Municipality 2011

Variable	Pulmonary +ve TB Cases n=21	Cured	Pearson Chi-squared	P-Value
Age			$\chi^2 = 4.20$; P = 0.04	
Younger than client	15 (71.4)	8 (53.3)		
Older than client	6 (28.6)	6 (100)		
Sex			$\chi^2 = 0.00$; P = 1.000	
Male	6 (28.6)	4 (66.7)		
Female	15 (71.4)	10 (66.7)		
Religion			$\chi^2 = 1.97$; P = 0.373	
Christian	14 (66.7)	8 (57.1)		
Muslim	2 (9.5)	2 (100)		
Traditional	5 (23.8)	4 (80.0)		
Level of education			$\chi^2 = 4.21$; P = 0.240	
None	5 (23.8)	5 (100)		
Primary/JHS	13 (61.9)	7 (53.9)		
SHS	2 (9.5)	1 (50.0)		
Tertiary	1 (4.8)	1 (100)		
Marital Status			$\chi^2 = 4.95$; P = 0.026	
Unmarried	8 (38.1)	3 (37.5)		
Married	13 (61.9)	11(84.6)		
Occupation			$\chi^2 = 0.15$; P = 0.694	
Unemployed	4 (19.0)	3 (75.0)		
Employed	17 (81.0)	11 (64.7)		
Selection of treatment supporter			$\chi^2 = 6.43$; P = 0.011	
By TB client	16 (76.2)	13 (81.3)		
By Health worker	5 (23.8)	1 (20.0)		
Relationship with TB client			$\chi^2 = 0.53$; P = 0.469	
Close relative	16 (76.2)	10 (62.5)		
Distant relative/ other	5 (23.8)	4 (80.0)		
Knowledge on TB			$\chi^2 = 7.29$; P = 0.026	
No knowledge	0	0		
Low knowledge	1 (4.8)	0		
Good knowledge	6 (28.6)	2 (33.3)		
Very good knowledge	14 (66.6)	12 (85.7)		
Motivation of Treatment Supporters			$\chi^2 = 0.53$; P = 0.469	
Not Motivated	1 (4.8)	1 (100)		
Motivated	20 (95.2)	13 (65.0)		
Challenges in the work of treatment of treatment supporter			$\chi^2 = 3.8$; P = 0.284	
No Challenge	10 (47.6)	8 (80.0)		
Had Challenge	11(52.4)	6 (54.5)		

Table 6. Unadjusted Odds Ratio for Treatment Supporter Factors Influencing Cure in Ketu South Municipality 2013

Variable	Odds ratio	95% CI
Married	17.33	1.38, 216.60
Selection of treatment supporter by TB client	16.50	1.36, 200.00

Other variables that were significant but not included in the table 5 were age of the treatment supporters compared to their TB clients; knowledge of treatment supporter in relation to treatment outcome of their client and cure for clients whose treatment supporters believed TB is curable compared to those who did not believe TB is curable. These variables were not included in the final model because either the proportion cured for one group was 100% or Zero (0)

4. Treatment Supporter Factors in Relation to treatment Completed in Ketu South Municipality

The total number of TB clients from which proportion completing treatment determined was 116 (84.7%) of the total 137 respondents used in the study. None of the treatment supporter factors showed statistical significance with respect to treatment complete (table 7). However 2 (100%) of the clients supervised by Muslims, 8 (100%) supervised by supporter with tertiary education and 9 (100%) by distant relatives completed treatment (table 7). Clients of married supporters recorded higher treatment complete 68 (82.9%) than those of unmarried 27 (79.4%). 61 (85.3%) of clients who selected their own clients completed treatment and 31 (75.6%) of clients completed treat for supporters selected by health workers. Knowledge again increased with proportion completing treatment even though not significant.

Table 7. Treatment Supporter Factors in Relation to Treatment completed for TB Cases in Ketu South Municipality in 2011

Variable	Pulmonary –ve TB Cases n=116	Completed	Pearson Chi-squared	P-Value
Age			$\chi^2 = 0.17$; P = 0.677	
Younger than client	60 (51.7)	50 (83.3)		
Older than client	56 (48.3)	45 (80.4)		
Sex			$\chi^2 = 1.50$; P = 0.221	
Male	47 (40.5)	36 (76.6)		
Female	69 (59.5)	59 (85.5)		
Religion			$\chi^2 = 0.60$; P =0.741	
Christian	83 (71.6)	67 (80.7)		
Muslim	2 (1.7)	2 (100)		
Traditional	31 (26.7)	26 (83.9)		
Level of education			$\chi^2 = 3.07$; P = 0.381	
None	27 (23.2)	22 (81.5)		
Primary/JHS	59 (50.9)	49 (83.1)		
SHS	22 (19.0)	16 (72.7)		
Tertiary	8 (6.9)	8 (100)		
Marital Status			$\chi^2 = 0.20$; P = 0.654	
Unmarried	34 (29.3)	27 (79.4)		
Married	82 (70.7)	68 (82.9)		
Occupation			$\chi^2 = 0.00$; P =0.958	
Unemployed	17 (14.7)	14 (82.4)		
Employed	99 (85.3)	81 (81.8)		
Selection of treatment supporter			$\chi^2 = 1.69$; P = 0.194	
By TB client	75 (64.7)	61 (85.3)		
By Health worker	41 (35.3)	31(75.6)		
Relationship with TB client			$\chi^2 = 2.16$; P =0.142	
Close relative	107 (92.2)	86 (80.4)		
Distant relative/others	9 (7.8)	9 (100)		
Knowledge on TB			$\chi^2 = 1.38$; P = 0.503	
No knowledge	0	0		
Low knowledge	6 (0.1)	5 (83.3)		
Good knowledge	34 (29.3)	30 (88.2)		
Very good knowledge	76 (65.5)	60 (79.0)		
Motivation of Treatment Supporters			$\chi^2 = 0.01$; P = 0.925	
Not Motivated	6 (5.2)	5 (83.3)		
Motivated	110 (94.8)	90 (89.8)		
Challenges in the work of treatment supporter			$\chi^2 = 0.70$; P = 0.873	
No Challenge	80 (69.0)	65 (81.3)		
Had Challenge	36 (31.0)	30 (83.3)		

4.5 Treatment Supporter Factors in Relation to Treatment Defaulted for TB Cases in Ketu South Municipality in 2011

None of the treatment supporter factors showed statistical significance with respect to treatment default (table 8). None of the four (4) clients supervised by Muslims and none of the nine (9) TB clients supported by treatment supporters with tertiary level of education defaulted.

The clients supervised by married treatment supporters recorded a lower 16 (16.8%) proportion of default. The default in the unmarried was 12 (28.6%). Among the unmarried treatment supporters group, the proportion defaulting also varied. Client of treatment supporters who are government workers had 1 (6.7%) whiles those who were either self-employed or working with NGOs, 23 (22.8%) of their clients defaulted.

Majority 130 (94.9%) of the treatment supporters were motivated but 20.8% of their clients defaulted. 86 (66.2%) of the treatment supporters, supported their clients because they were family members and 20 (23.3%) of their clients defaulted, those who supported their clients because they thought it is their duty to do so were 39 (30%) and 6 (15.4%) of their clients defaulted. Other reasons for supporting were to help reduce the burden in the community formed 2 (0.8%) and none of their clients defaulted, and those who did it to reduce pressure on the health facilities were 2 (1.5%) and none of their clients too defaulted. None of the nine (9) TB clients of the treatment supporters who were paid for supporting their clients defaulted.

29 (21.2%) of the treatment supporters had financial challenge in supporting their client. Those that time factor was a challenge for were 18 (13.1%) and 4 (22.2%) of their clients defaulted.

Table 8. Treatment Supporter Factors in relation to treatment default for TB cases in Ketu South Municipality 2011

Variable	Pulmonary TB Cases n=137	defaulted 28	Pearson Chi-squared	P-Value
Age			$\chi^2 = 1.29$; P = 0.255	
Younger than client	75 (54.7)	18 (24.0)		
Older than client	62 (45.3)	10 (16.1)		
Sex			$\chi^2 = 1.90$; P = 0.168	
Male	53 (38.7)	14 (26.4)		
Female	84 (61.3)	14(16.7)		
Religion			$\chi^2 = 1.64$; P = 0.440	
Christian	97 (70.8)	22 (22.7)		
Muslim	4 (2.9)	0		
Traditional	36 (26.3)	6 (16.7)		
Level of education			$\chi^2 = 5.2$; P = 0.156	
None	32 (23.4)	5 (15.6)		
Primary/JHS	72 (52.6)	15 (20.8)		
SHS	24 (17.5)	8 (33.3)		
Tertiary	9 (6.6)	0		
Marital Status			$\chi^2 = 2.46$; P = 0.116	
Unmarried	42 (30.7)	12 (28.6)		
Married	95 (69.3)	16 (16.8)		
Occupation			$\chi^2 = 0.03$; P = 0.864	
Unemployed	21 (15.3)	4 (19.1)		
Employed	116 (84.7)	24 (20.7)		
Selection of treatment supporter			$\chi^2 = 2.61$; P = 0.106	
By TB client	91 (66.4)	15 (16.5)		
By Health worker	46 (33.6)	13 (28.3)		
Relationship with TB client			$\chi^2 = 1.70$; P = 0.193	
Close relative	123 (89.8)	27 (22.0)		
Distant relative/ other	14 (10.2)	1 (7.1)		
Knowledge on TB			$\chi^2 = 0.19$; P = 0.908	
No knowledge	0	0		
Low knowledge	7 (5.1)	1(14.3)		
Good knowledge	40 (29.2)	8 (20.0)		
Very good knowledge	90 (65.7)	19 (21.1)		
Motivation of Treatment Supporters			$\chi^2 = 0.17$; P = 0.679	
Not Motivated	7 (5.1)	1 (14.3)		
Motivated	130 (94.9)	27 (20.8)		
Challenges in the work of treatment of treatment supporter			$\chi^2 = 0.04$; P = 0.840	
No Challenge	119 (86.9)	24 (20.2)		
Had Challenge	18 (13.1)	4 (22.2)		

According to the institutional TB coordinators, challenges in the use of treatment supporters include; (i). “Some of the TB clients either do not have any relative willing to support them or could not identify anybody that could support them”, (ii). “Some treatment supporters want to share the enabler’s package meant for the TB clients with them” and “Extended family members or supporters who are far from the TB clients find it difficult to monitor their clients regularly.

CHAPTER FIVE

DISCUSSIONS

5.1 Proportions of Tuberculosis Treatment Cure, Completion and Default

A record review done at the three health facilities practicing DOTS in the Ketu South Municipality revealed that 341 cases were recorded in the year 2011 which gave the municipality a case detection of 96.1%. 137 cases of 218 adult TB cases that had treatment supporters residing in Ketu South Municipality and could be traced and interviewed were used for the study. The rest 81 of them could not be interviewed due to incorrect address or migration from their community or municipality. The case detection found in this study is higher than the one (81%) found in a study by Chanda & Gosnell, (2006), in Zambia.

As indicated by the WHO, (2012), that treatment for new cases of drug susceptible TB consists of a six month regimen, close to half of the cases were supervised up to five or six months and those supervised for at least two months had a very good successful outcomes. This is similar to what Anuwatnonthakate et al., (2008) found out in Thailand that two months of DOT resulted in improved treatment outcomes

A successful treatment outcome from this study (79.6%) is close to the 82% found in a study by Edginton, (1999) in South Africa. According to (Frieden & Sbarbaro, 2007), WHO indicated that about 30 million people have been treated with DOTS resulting in a cure of more than 80%. But in this study conducted in Ketu South Municipality where DOTS is being practiced, the proportion of TB clients cured was less than the 80% but similar to what was found by Chanda & Gosnell, (2006) in Zambia. The proportion of TB clients that completed treatment from the analysis was 81.9%.

From the study, the proportion (20.4%) of TB clients with treatment supporters that defaulted treatment is higher than what was found in other studies. For instance in the work of Gelmanova et al., (2007), 8.8% of TB clients defaulted. Also Franke et al. (2008), indicate in their work that 10% of Multi-Drug Resistant (MDR) TB clients defaulted during their treatment. The high default could be due to the fact that some treatment supporters have difficulties in reaching their clients as some of them said they "waste" a lot of money to reach their clients. One of the institutional coordinators also said, treatment supporters who are far from the TB clients find it difficult to monitor their clients regularly. This high default could lead to the development of Multi-Drug Resistant TB (MDR-TB).

5.2 Treatment Supporter Factors in Relation to Treatment Outcomes

5.2.1 Demographic Factors

It was realized that the TB clients supervised by the treatment supporters older than them were cured more than those that were supervised by treatment supporters younger than them. The proportion cured among those supervised by supporters older than them was 100% while proportion cured for those supervised by people younger than them was 53.3% ($p = 0.04$). Age of the treatment supporter was not significant in the case of completion of treatment ($P = 0.677$) and those defaulting ($P = 0.255$) even though those with supporters older than them recorded a much lower defaulter proportion than those younger than their clients.

Majority of the treatment supporters were females even though a higher proportion of the TB clients were males. For pulmonary positive TB clients, 71.4% of them were supervised by female treatment supporters and also 59.5% of the pulmonary negative cases were supervised by females. Proportion of TB clients cured for both male and female treatment supporters was the same in the study ($P = 1.000$). The proportion completing treatment for females supporters was

higher than for males supporters though not significant (P = 0.221). A better result was found for defaulting among females than males. The proportion cured, completed were higher and proportion that defaulted was lower for female treatment supporters found in Ketu South than those found among female treatment supporters identified in Thailand by Anuwatnonthakate et al., (2008)

All the TB clients supervised by Muslims record 100% treatment with Christians having the lowest treatment success but the differences in the treatment outcomes were not statistically significant. Majority of the treatment supporters had some education. All the clients of treatment supporters who had no education and tertiary education were cured. This is similar to the finding of Egwaga et al., (2009) that DOT by lay men is feasible and can result in good treatment outcomes. It is also in line with the work of Ali, (2008) which indicates that there was no statistical difference in educational level of the treatment supporters. All the clients supervised by supporters attending tertiary level of education completed treatment.

Married treatment supporter supervised greater proportion of the TB clients than the unmarried group. This supports the finding of Wandwalo et al (2006) in Tanzania that married treatment supporters were more likely to agree to supervise TB patients than unmarried treatment supporters. Also the proportion of TB clients supervised by married supporters that were cured was more than that of the unmarried supporters. This shows that clients being supervised by married supporters are likely to be cured than those supervised by unmarried supporters (P = 0.026).

Most of the treatment supporters used was employed. From the study whether the treatment supporter is employed or not did not have effect on cure even though the proportion cured for

unemployed supporters was higher than the employed. There was not so much difference in completed and defaulted outcomes for the unemployed and employed treatment supporters.

5.2.2 Selection of Treatment Supporters

TB clients selected majority of their treatment supporters which is in line with the work of Frieden & Sbarbaro, (2007) in Senegal indicating that patients selected their own treatment supporters. Whether a treatment supporter is selected by the TB client or health worker influences the treatment outcome for cure in Ketu South. The proportion of cure for TB clients who selected their own treatment supporters was 81.3% as compared to 20.0% of those that health workers selected their treatment supporters for them (P = 0.011). This supports the work of Egwaga et al., (2009) in Tanzania that observer changed from a health-care worker to a supporter of choice will yield a good result. The selection of treatment supporter however did not influence completion of treatment or treatment default although good completion and defaulting were recorded among those who selected their own clients.

Most of the TB clients were supported by their spouses, parents, siblings or children termed closed relative in the study which is similar to what Nachega et al., (2006) found out in South Africa that patients and health care workers identify individuals who are usually mother, child, sibling or spouse as treatment supporters. Those supervised by distant relative or people not related to them had a higher cure than those supervised by close relatives but this did not show any statistical significance (P = 0.469). Completion of treatment as well as treatment default was not significant for treatment supporter's relationship with TB client.

5.2.3 Tuberculosis Treatment Supporters' Knowledge on TB

Majority of the treatment supporters had very good knowledge about TB according to the criteria used in this study. Knowledge of the treatment supporters on TB showed significance in relation

to the cure of their TB clients they supported. It showed that increase in knowledge about TB increases with the cure (P = 0.026). The proportion of the TB clients cured for treatment supporters who indicated that TB is curable was 77.8% and none of the clients of those who said TB is not curable was cured. This difference is statistically significant (P = 0.030). This finding supports work of Wandwalo et al., (2006) that former TB patients were willing to support and encourage other TB patients that the disease is indeed curable for the patients to complete medication. Majority of the treatment supporters knew that it takes at least six months for TB clients to complete their treatment as indicated by WHO, (2012), that treatment for new cases of drug susceptible TB consists of a six month regimen and also by Egwaga et al., (2009) that the WHO recommended that observation of treatment should be throughout the six months of treatment regimen.

5.2.4 Motivation of Treatment Supporters

Most of the treatment supporters had some motivation that made them to support their clients. Majority of them were motivated because the TB clients were their family members, some supported because they thought it was their duty to do so and the rest supported the TB clients with the purpose of reducing the burden of the disease in the community, to help reduce pressure on the health facility and for the client to be cured. This finding is similar to what Wandwalo et al (2006) found in Tanzania that some treatment supporters were willing to support TB client because they were duty bound, others were willing to supervise TB patients in order to reduce the burden of TB in the community and the rest were willing to supervise family members.

According to the treatment supporters, for them to be motivated, health workers should be visiting them during the course of supporting their clients, and this was said by 46.1% of the supporters. 32.0% of the supporters said they should be paid and 1.5% said just saying thank you

is enough to motivate them. Treatment supporters saying health workers should visit them was also found in Tanzania by Wandwalo et al (2006) who stated that most treatment supporters would like health workers to visit them more frequently in the community.

In a study by Barker, Millard, & Nthangeni, (2002), in South Africa, it was found out that TB patients supervised by unpaid community volunteers recorded a better treatment outcome compared to those supervised by professional health workers but this study revealed that all TB clients supervised by treatment supporters who were paid, completed their treatment compared to 81.1% completing treatment for those who were not paid. The finding supports a similar finding in a community based DOT programme in which supporters who were given a financial reward had their patients' success rate to be 85% and those without financial reward recorded 77.6% (Kangovi et al., 2009)

5.2.5 Challenges in the Work and Use of Treatment Supporters

Most of the treatment supporters did not have any challenge in supporting TB clients. There was no statistically significant difference between those who had some challenges and those who did not have any challenge. The proportion of cure for treatment supporters who had some challenge was less than those who did not have any challenge. For completion and default of treatment the proportions were almost the same.

The challenges faced by the treatment supporters were mainly financial and time factor. Some of them said they waste a lot of money to reach their client. This is in line with the finding of Munro et al., (2007) that some of the challenges for TB treatment were not having money to go for TB drug and time needed for the direct observation of the drug intake. It is also in line with

what Egwaga et al., (2009) found in Tanzania that the main problem encountered in the use of treatment supporters was the need for incentives expressed by the treatment supporters.

According to the institutional TB coordinators, some of the challenges in the use of treatment supporters include TB clients not having anybody to supervise them or people not willing to support them in the course of their treatment, or they could not identify anybody that could support them. The rest of the challenges were that some treatment supporters wanted to share the enabler's package meant for the TB clients with them and treatment supporters who were far from the TB clients find it difficult to monitor their clients regularly. The last challenge mentioned by the institutional coordinators confirms that of the treatment supporters that they waste a lot of money reaching the TB clients. People not willing to support some TB clients in Ketu South was also indicated by Frontières, (2011) that lack of family support was among the challenges to adherence to TB treatment.

5.3 Limitations

Treatment outcomes were based on the record at the DOTS centres in the municipality. No verification was done to check if SSM was done to confirm cure. All the TB clients with treatment supporters were not used in the study due to incorrect addresses and migration from the community.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The following conclusions were drawn from the study:

1. The case detection for Ketu South Municipality was 96.1%
2. Treatment success for the municipality was 79.6% with cure, completion and default being 66.7%, 81.9% and 20.4% respectively.
3. Treatment supporter factors influencing treatment outcome include; age of treatment supporter being older than the TB client, married treatment supporter, selected by the TB client and supporter having good knowledge on TB.
4. What motivate people in Ketu South to support TB clients include: When the TB client is a family member, to reduce the burden of the disease in the community, to help reduce pressure on the health facility and for the TB client to be cured. Some see it as their duty to do so.
5. The two main challenges faced by the treatment supporters in Ketu South Municipality include; finance and time spent on supervising their clients.

6.2 Recommendations

In order to improve cure of TB clients, the following recommendations are made:

6.2.1 To the Institutional Coordinators

a. Institutional TB coordinators should support TB clients to select their own treatment supporters who are older than them, married and also close to them in order to avoid cost of traveling and spending so much time on observing the drug intake

b. The treatment supporters selected by the TB client should be sensitized on TB by the institutional coordinators and these supporters made to understand that TB is curable therefore it is important for the client to complete the treatment.

6.2.2 To the District Health Management Team (DHMT)

As a motivation, the DHMT should make sure institutional coordinators, disease control officers and Community health nurses visit the treatment supporters regularly during the course of treatment as indicated by some treatment supporters

6.2.3 To the National Tuberculosis-control Programme (NTP)

National Tuberculosis-control Programme (NTP) should provide enabler's package (token) for treatment supporters too as done for the TB clients.

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APPENDIX

CONSENT FORM

Study title: Tuberculosis Treatment Outcomes Using Treatment Supporters in Ketu South Municipality of the Volta Region in Ghana

Principal Investigator: Charles Kofi Azagba

Qualification: Master of Public Health (Student)

Tel: 0268947794 Email: azagbaw@yahoo.com

General Information about the Study

Charles Kofi Azagba is conducting a study to assess treatment supporter factors influencing Tuberculosis treatment outcomes in the Ketu South Municipality of Ghana. The findings from the study will be used to improve management and care of tuberculosis patients in the municipality; thus reducing further spread of TB in the community. The study which is purely academic work involves answering questions from a questionnaire. It does not involve any invasive procedure for samples. A trained interviewer will administer a questionnaire in order to collect data and it will take less than 30 minutes to complete.

Taking part in this study may not bring you direct benefit but will help improve management of Tuberculosis patient thereby preventing other people from getting Tuberculosis. There are no risks associated with the interview.

Please note that any information given to us will be kept strictly confidential and used for the purpose of the study only. Your responses will in no way lead to any adverse effect on you.

Your participation in this study is voluntary and you can decide to stop at any time. I therefore request you to assist with answering the questions included in this questionnaire.

If you agree to this interview, I will proceed to ask you the questions but if you do not agree, you can let me know at this point and I will not proceed with the interview.

Contact Persons for Any Information About Study:

You can contact the following people when you have any further question concerning the study after the interview:

1. Charles Kofi Azagba – Principal Investigator - 0268947794/ 0201802973

2. Miss Nana Abena Kwaa Addai-Donkor - Administrator, Ghana Health Service Ethical Review Committee - 0244712919

APPENDIX 2

DEPARTMENT OF EPIDEMIOLOGY AND DISEASE CONTROL

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF GHANA

LEGON

CHECKLIST FOR RECORD REVIEW ON TUBERCULOSIS TREATMENT OUTCOMES USING TREATMENT SUPPORTERS IN KETU SOUTH MUNICIPALITY OF VOLTA REGION IN GHANA

CHECKLIST FOR RECORD REVIEW ON TB CLIENTS

Name of research assistant: _____

Record review date:____/_____/_____ Sub-municipality _____

Number of TB Client (eg. TC 001) [ ]

Name of TB client _____

Name of Treatment supporter (from hospital records) _____

Address of the TB client or his/her treatment supporter_____

_____

_____

Write the number of response given in "No. OF RESPONSE" column

ITEM No.	QUESTION	RESPONSES	No. OF RESPONSE
1	Name of the health facility	1. Municipal Hospital 2. Central Aflao Hospital 3. New Hope Clinic	

2	Age of the TB client (in complete years)		
3	Sex of the TB clients	1. Male 2. Female	
4	Disease classification	1. Pulmonary Positive 2. Pulmonary Negative 3. Other	
5	Treatment outcome status	1. Cured 2. Completed 3. Defaulted 4. Died, relapsed, failure or transferred out 5. Other (specify)	
6	Duration of support (from hospital record)	1. less than 2 months 2. 2 to less than 4 months 3. 4 to 6 months 4. Other (specify)	

TC – TB Client

APPENDIX 3

DEPARTMENT OF EPIDEMIOLOGY AND DISEASE CONTROL

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF GHANA

LEGON

QUESTIONNAIRE FOR INTERVIEWING TREATMENT SUPPORTERS ON TUBERCULOSIS TREATMENT OUTCOMES USING TREATMENT SUPPORTERS IN KETU SOUTH MUNICIPALITY OF VOLTA REGION IN GHANA

This questionnaire is prepared for a dissertation for a Master of Public Health Course. Please answer questions with all honesty.

Name of interviewer:_____

Date of interview:_____/_____/_____ Sub-municipality_____

Number of treatment supporter (eg. TS 001) [ ]

Name of TB client (from checklist) _____

Name of Treatment supporter _____

Address of treatment supporter or TB client (including phone No.)_____

_____

_____

Write the number of response given in No. OF RESPONSE COLUMN

ITEM No.	QUESTION	RESPONSES	No. OF RESPONSE

Background Characteristics of Treatment Supporters and their Selection			
1	Age: What is your age? (in complete years)		
2	Sex of the treatment supporter	1. Male 2. Female	
3	Religion: What is your religion?	1. Christian 2. Muslim 3. Traditional 4. Other (specify)	
4	Education: what is your highest level of education?	1. No education 2. Primary/ JHS 3. SHS 4. Tertiary	
5	Occupation: What is your occupation? (put the occupation under any of the three in responses column)	1. unemployed 2. Self Employed or informal 3. Government employee 4. Other (specify)	
6	Marital status: what is your marital status?	1. Single 2. Married 3. Divorced/ separated 4. Widowed 5. Other (specify)	

7	Who selected you as treatment supporter	1. Health worker 2. TB client 3. Other (specify)	
8	What is your relationship with the TB client	1. Parent 2. Spouse 3. Sibling 4. Child 5. Other (specify)	
Treatment Supporters' Role and Knowledge on TB			
9	How often do you collect drug from the health facility?	1. Monthly 2. Every two months 3. Twice in treatment period 4. Other (specify)	
10	What are signs and symptoms of TB? (indicate as many as the respondent mentions)	1. Coughing 2. Weight loss 3. Fever 4. Tiredness 5. Loss of appetite 6. Night sweat 7. Others (specify)	
11	How is TB transmitted?	1. Inhalation of TB bacilli (sneezing, coughing, indiscriminate spiting etc)	

		2. Do not know 3. Other (specify)	
12	Is TB curable?	1. Yes 2. No 3. Do not know	
13	What are some of the preventive measures? (indicate as many as the respondent mentions)	1. BCG vaccination 2. Early case detection 3. Covering of mouth or nose when coughing or sneezing 4. improving housing 5. Avoiding indiscriminate spitting 6. Early treatment 7. Other (specify)	
14	How long does it take TB client to complete treatment?	1. Six months 2. Eight months 3. Other (specify)	
15	What is the aim of treatment?	1. To cure the TB client 2. To prevent others from getting TB 3. To alleviate pain or coughing 4. Do not know	

Motivation of TB treatment Supporters			
16	What motivated you to support your client?	1. Because is a family member 2. Because is my duty to do so 3. To reduce the burden of the disease in the community 4. It helps to reduce pressure on health facilities 5. Other (specify)	
17	What do you think should be done that will make treatment supporters support their client well?	1. Health workers should visit the supporters regularly 2. Treatment supporters should be paid 3. Other (specify)	
18	Were you paid?	1. Yes 2. No	
Challenges in the work and use of treatment supporters			
19	What were the challenges in your work as treatment support? (for treatment supporter)	Specify:	
20	What were challenges in the use of treatment supporters? (for institutional coordinator)		

TS – Treatment supporter