INFLUENCE OF COMMUNITY HEALTH WORKERS ON TIMING FOR TB MANAGEMENT AMONG PATIENTS WITH PULMONARY TUBERCULOSIS IN DAR ES SALAAM, TANZANIA.

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By

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A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Public Health of

Muhimbili University of Health and Allied Sciences
October , 2019

CERTIFICATION

The undersigned Certifies that has read and hereby recommend for acceptance by Muhimbili University of Heath and Allied Sciences dissertation entitled "**Influence of Community Health Workers on Timing for TB management among Patients with Pulmonary Tuberculosis in Dar es salaam, Tanzania"**, in (partial) fulfilment of the requirements for degree of Master of Public Health of the Muhimbili University of health and allied Sciences.

_____

Prof. Donath Tarimo

(Supervisor)

_____

Date

DECLARATION OF COPYRIGHT

I, **Dr. Happiness Willbroad Kyamanywa**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature…… **Date** ……

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DEDICATION

I dedicate this work to my family.

My husband Bernard R. Kisunte for his ceaseless love and support.

My lovely son Jayden Marwa, for his love and understanding.

My wonderful Mother Annastasia W. Alexander, she has always been my strength and a reason I made this far.

My siblings; Immaculate, Alexander and Jackson for their everlasting love, support and prayers.

ABSTRACT

Background: Although most deaths resulting from Pulmonary Tuberculosis (TB) in Tanzania can be prevented by early detection, TB case detection rate has remained low at 36%. A number of factors contributes to the low detection rate, among them being delays in TB management from both the client and facility perspectives. Though Community Health Workers (CHWs) have the potential to increase TB case detection rate evidence on their role on timing for TB management has not been explored. This study sought to establish the role of CHWs in timing for TB management among PTB patients in Dar es Salaam Region.

Objectives: This study examined the influence of CHWs in timing for TB management among PTB patients in Dares Salaam.

Methodology: A quantitative facility based cross sectional survey was conducted among 451 smear positive TB patients from selected health facilities in Dar es Salaam. Participants were interviewed regarding their knowledge on TB symptoms that lead to care seeking, the duration from onset of symptoms to receiving medical management, and whether a CHW was involved in the process of seeking care. Data on patients' socio-demographics, facility and community-based characteristics were also gathered. The SPSS statistical package was used for data analysis; descriptive statistics were used to summarise the data, while bivariate analysis was carried out to examine the association between CHWs involvement in care seeking with timing for medical management. A multivariate analysis was carried out to adjust for individual patients, community and facility factors that influence timing for medical care and the associations were set at the significance level of 0.05.

Results: A total of 451 participants were recruited; more than half (69%) being males and most of them (40.7%) being 30-44yrs. About half (52.1%) of the patients sought care following prolonged cough, other symptoms being less presented. Although more than two thirds (71.6%) (self and community referrals) presented at the facilities timely, more than a half (58%) were delayed in receiving TB diagnosis. Only less than a quarter (20.6%) of the patients were community referrals. Self-referrals were significantly knowledgeable on

prolonged cough (p = 0.03) and night sweats (p = 0.001) as TB symptoms. Though more than two thirds (72.5%) who sought care timely were self-referrals, the type of referral did not significantly influence timing for care seeking. A large majority (92%) of the patients received TB treatment timely; of these, self-referrals were 2.5 more likely to receive treatment timely than community referrals (p = 0.02).

Conclusion; Although Community Health care workers were found not to influence the timing for TB management among pulmonary tuberculosis patients the study found that they reach higher proportion of patients with low level of TB knowledge which would implicitly improve their contact with the health care facilities for TB management.

Recommendations; Community programs should be strengthened so as to ensure wide coverage and early detection of the missing TB cases. Further follow up studies are recommended so as to be able to show the exact influence of CHWs on the timing for TB management.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
DOT	Direct Observed Therapy
FGD	Focused Group Discussion
HIV	Human Immunodeficiency Virus
MOHCDGEC	Ministry of Health Community Development Gender Elderly and Children
NBS	National Bureau of Statistics
PI	Principal Investigator
PTB	Pulmonary Tuberculosis
SBCC	Social Behavioural Change Communication
SPSS	Statistical Package for Social Science
WHO	Word Health Organisation
CI	Confidence Interval
FBO	Faith Based Organization
HFR	Health Facility Registry
IRB	Institutional Review Board
MUHAS	Muhimbili University of Health and Allied Sciences
OR	Odds Ratio
QI	Quality Improvement
TB	Tuberculosis

OPERATIONAL DEFINITIONS

Pulmonary Tuberculosis

Pulmonary Tuberculosis (TB) is a chronic infectious disease caused mainly by Mycobacterium tuberculosis and occasionally by Mycobacterium bovis or Mycobacterium africanum. The disease is transmitted from one person to another through inhalation of droplets during coughing, laughing, sneezing and singing however coughing remains to be most common means of transmission. (1)

Tuberculosis management Timing

Refers to the period of receiving TB care and treatment from the onset of symptoms and health care seeking. In this case total management delay will be taken as the sum of patient and health facility delay. (2)(3)(4)(5)

- **Patient delay (Health care seeking delay):** This refers to the number of days lapse from symptom recognition to 1st health facility attendance considered as
    1. <30 days – not delayed
    2. >30 days – delayed
- **Health facility delay**: Refers to number of days lapse from 1st attendance to health facility to initiation of ant TB therapy considered as:
    1. <5 days – Not delayed
    2. >5days – delayed

Community

Is a group of people, based on common values and norms, who live within a geographically defined area and who share a common language, culture or values.(6)

Community-based TB activities

Activities covering a wide range of initiatives conducted outside of the formal health facilities that contribute to detection, referral and treatment of people with drug-susceptible Tuberculosis.(6)

Community Health Worker: Female and/or male individuals chosen by the community and trained to address health issues of individuals and communities in their respective localities, working in close relationship with health facilities.(6)

Community volunteers: people who have been systematically sensitized about TB prevention and care, either through a short specific training scheme or through repeated, regular contact sessions with professional health workers.(6)

NB: For this study all community referrals will be referred as community health care workers (CHW) referrals. We will not distinguish between CHVs and CHWs instead only the term CHW will be used.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Tuberculosis (TB) has existed for millennia and remains to be a major global health problem that causes ill-health in millions of people each year(7). TB is the ninth leading cause of death worldwide as well as the leading cause from a single infectious agent, ranking above HIV/AIDS(8). The first milestones of the End TB Strategy are set for year 2020 and are aiming at 35% reduction in TB deaths and 20% reduction in TB incidence if compared with levels in 2015(8). Tanzania ranks 6thamong the highest TB burden countries in Africa and is among the 22high burden countries globally(9). The notified TB mortality in Tanzania using the new WHO 2013 definition was 5.8% in 2012 for all categories of TB(9). Tanzania aims at increasing TB case detection by 29% by 2020 from 2013 levels one among the set measures being through strengthening of TB case notification. The ministry also aims at supporting implementation of good quality, accessible, and equitable TB and Leprosy services in the country by 2020 through health and community systems strengthening (9)

Back in 2013 notified new and relapse TB cases were 64,053.TB case notification per 100,000 population increased in the late nineties due to HIV, up 159/100,000 in 2008 then dropped gradually during the last decade to 140/100,000 in 2011(9). The disease trend then increased slightly to 142/100,000 in 2013, although the notification of smear positive TB cases did not drop as sharply as all TB cases(9).Despite the fact that the notification of TB cases per population is decreasing, the total number of TB cases in 2012 remained essentially the same as in 2003. Both in 2003 as well as ten years later, 25,000 smear positive TB cases were notified, with 65,732 TB cases overall in 2013 (9). Looking at the current data the notification rate of new and relapses TB cases in 2016 was 129 cases per 100,000 population which was slightly higher if compared to that of 2015 that was 125 per 100,000 population(10). The Prevalence of TB all forms stands at 528 per 100,000 TB with incidence of 327 per 100,000 and only 36% TB case detection rate (6).WHO global TB report of 2015 estimated that Tanzania is missing approximately 108,429 TB cases all forms each year.

Apart from missing out a lot of Tb cases, Tanzania has noted a large regional variation in the trend of TB case notification, this indicates the probability of a considerable under diagnosis or TB cases underreporting in some regions(9)The regional TB notification contribution are at (21.9%) in Dar es Salaam, (9.3%) in Mwanza, 6.4% in Shinyanga, 6% in Mbeya, 4.9%in Mara, 4.7% in Arusha and Tanga, 3.8% in Iringa and 3.5% in Iringa. All other remaining regions contributes only 29.4% of the total reported cases(9)(1).

Before year 2003 TB case finding in Tanzania was mainly passive but from that year, Community based TB care which includes community mobilization activities for TB control have allowed TB patients to actively engage themselves in TB and TB-HIV control activities. (6)Ongoing community TB mobilization activities engages previously treated TB patients groups whereby over 400 groups (ex TB groups)) have been identified and through them community contribution in TB case notification has been increased from 15% (2013) to 19% (2014) of all TB cases notified nationally(6).

1.2 Problem statement

Despite of the observed high national DOTs coverage, higher proportion of home-based DOT and treatment success, a number of challenges still exist in the control and prevention of TB in Tanzania. Patientsdelays in seeking health care constitutes a major challenge and is a source of persistent transmission of TB in the community; this partly results from the passive participation of the community in TB care and control and stigma associated with TB and HIV(6).Studies conducted in Mwanza and Pwani regions, showed that patient's delaysconstituted 90% and 38% of delays in TB management (4, 5). Apart from these another study conducted in Dar es Salaam showed that TB diagnostic delay in urban Tanzania may possibly be resulting from the passive case detection practice(11). Although Dar es Salaam has the highest TB notification rate, the dynamics of care seeking for TB and the role CHWs in timing for TB management have not been fully explored (11).

Additionally, TB case detection rate in Tanzania stands at only 36% TB which is below the national target of 90%(6).This means that most of the cases are going on undiagnosed at the communities and hence increased disease transmission. Reducing delays in care seeking would conceivably increase case detection rate. As part of addressing TB case notification gap the Ministry of Health came up with TB community interventions aiming at increasing community level TB awareness hence improve the community health seeking behavior(6).

Although implementation of these community interventions which includes awareness raising, active TB case finding and clients follow up for treatment adherence through community health care workers has started in different regions a little is still known on the contribution of these community initiatives specifically active TB finding on timing for TB Management.

This study therefore intends come up with the status of TB management timing among PTB patients in relation to the CHW engagement in the process of referral of clients currently on treatment and establish if there is a difference among self and community referrals.

1.3 Rationale

At this juncture when the Ministry is promoting different methods of finding the missing TB cases in order to increase notified TB cases including use of community health workers in facilitating active TB case finding and taking into consideration that a little is still known on the influence of community health workers in reducing TB management delays then it is of importance to establish the contribution community health workers in timing for TB management for the patients seeking health care at the health facilities as well as other factors linked to delays.

The study will give a picture of the community health workers contribution in reducing TB management delays hence help to enhance meangfull planning for TB services provision in the region. Though not conclusive the study will also give highlights to implementers and donors working on the community interventions and as well as inform other researchers on the areas that may need further research in the like aspects.

1.4 Conceptual Framework

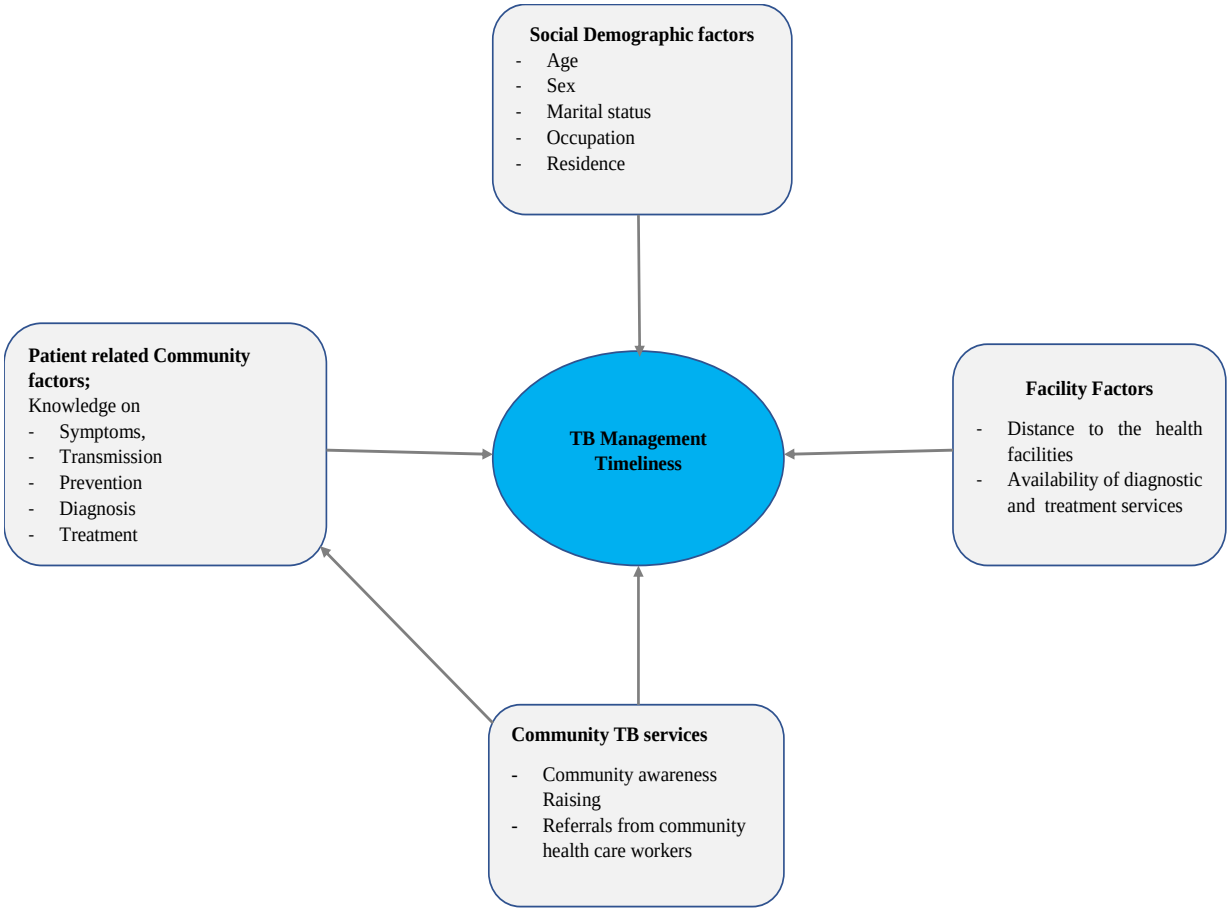


Figure 1: Conceptual framework showing factors contributing to TB management

Source: Researcher own formulation

The conceptual framework in figure 1 above demonstrates the relationship and linkage between community, socio demographic and facility factors to health care seeking and TB diagnosis and treatment.

TB management timing can be contributed upon by different factors some of them being social demographic factors, patient related factors like knowledge on the TB symptoms, transmission and prevention, availability of Community TB services such as awareness raising interventions and active TB finding which are normally done by community health care workers as well as facility factors such as availability of diagnostic and treatment services. The scope of this study will mainly look at the social demographic factors, Patients related factors and community TB services specifically referral from community health care workers (independent variables) contribution to the timing for TB management (dependent variable).

1.5 Research Questions

1.5.1 Broad Research Question

Broadly the study aims to answer the question: What is the influence of CHW in timing for TB management among PTB patients?

1.5.2 Specific Research Questions

i. What is the influence of CHWs on the knowledge of Tuberculosis symptoms, mode of transmission, treatment and prevention among PTB patients?
ii. What is the association between community referrals with timeliness in seeking care for PTB patients?
iii. What is the association between community referrals with timeliness in obtaining a laboratory diagnosis of PTB?
iv. What is the association between community referrals with timeliness in obtaining a treatment for PTB?

1.6 Research Objectives

1.6.1 Broad objective

To determine the influence of CHWs in timing for TB management among PTB patients in Dar es Salaam Region.

1.6.2 Specific objectives

i. To determine the influence of CHWs on the knowledge of Tuberculosis symptoms, mode of transmission, treatment and prevention among PTB patients.

ii. To examine the association between community referrals with timeliness in seeking care for patients with PTB.

iii. To examine the association between community referrals with timeliness in obtaining a laboratory diagnosis/ sputum finding among patients with PTB.

iv. To examine the association between community referrals with timeliness in obtaining a treatment for PTB

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Most deaths resulting from TB can be prevented with early diagnosis and appropriate treatment. Millions of people who are diagnosed complete TB treatment successfully each year hence avoiding millions of deaths (53 million 2000–2016), but there are still large gaps in detection and treatment (2). Tuberculosis treatment delay can result from either patient delay, health system delay or both. In most of the studies patient delay was seen to be longer than health system and health provider delay meaning most of the patients for some different reasons stays longer at the community before making their first appointment with the health care providers but this is not the case in some of the areas.

A study conducted in Ethiopia showed a total delay of 80 days with longer patient delay (30 days) than health system delay (21 days). This study also showed a different trend of delay if related to the health provider i.e. ether formal or non-formal health provider were involved and in that case provider delay was seen to be longer than patient delay, 61 and 15 days respectively more delay being seen in patients who contacted non-formal providers first(12). A study conducted in Uganda showed a median total delay of 12 weeks but in this case health service delay represented the main component of the total delay (74%). This reflects inadequacy of the clinical services in diagnosing TB among symptomatic patients (8). Another study done in Mozambique showed long total delay (150 days) with a similar contribution of both patient delay (61 days) and health system delay (62 days) (13).

Three studies conducted in Tanzania showed a significant delay of TB diagnosis and treatment mainly contributed by the patients i.e. there is a noted longer delay at the community level rather than facility level and the effect is higher in rural than urban areas with more effect seen in patients staying far from the health facilities (2)(5)(3). One of these studies that was conducted in Mwanza Region, Tanzania reported a mean total delay of 185 days out of these 90% being contributed by the patient delay i.e. 23 days mean health facility delay if compared

to 162 days mean patient delay(2). Another study conducted in Pwani Tanzania region reported a total delay of 125 days and 75.8 days patient delay. The proportion of delay contributed by patient was at 63%, this is low than 90% patient contribution that was reported in Mwanza(3). Although it was not looked at, difference in delay were thought that they could have been contributed by the study site, cultural factors and rising TB awareness among the communities(3).

The revised studies above also looked at the factors associated with TB treatment delay which contributes to morbidities, mortalities and high rate of disease transmission in the community. Identified factors includes misconception about TB /HIV, poor knowledge on TB, long distance to the health facilities, lack of employment, prior attendance to non-formal providers and accessibility of simple and rapid TB diagnostic test (12)(5)(3). Another study conducted in Bangladesh and Swaziland also showed that the main factor contributing to patient delay was patients' unawareness of the severity of the symptoms due to, not having well-defined symptoms at the presentation of the disease or a lack of knowledge of TB symptoms (which were often attributed to other diseases). Other factors that caused delay were specific to the country context, such as the distance to the facility and the cost associated with transportation, fear of being diagnosed with TB, and the stigma that might follow such diagnosis(14). This shows a commonality in the reported factors that results to TB management delay in different countries and settings.

2.2 Community factors

Community knowledge and awareness on signs and symptoms of Tuberculosis are essential in health care seeking. One of the study conducted in Tanzania found community awareness as one among the factors associated with delayed health care seeking and recommended that an Increasing community awareness of TB signs and symptoms could further reduce diagnostic delays and interrupt TB transmission(11). Another studies conducted in Ethiopia also shows the relationship between poor knowledge and patient delay in TB diagnosis(15).

Provision of TB and TB/HIV information (awareness creation) among others, to the community members is part of the task expected to be accomplished by community health

workers through effective social mobilization(6). This means availability of CHWs may partly help to reduce the barrier to accessing TB care contributed by the level of community knowledge.

2.3 Sociodemographic variables

At the community level delays are mainly seen to arise from different social demographic factors and the general social context. These factors among others distinguishes the community behaviors in line with the age group, education, social economic status, marital status etc. Depending on the settings some of the social demographic variables can be found relevant. One of the study conducted in Dar es salaam Tanzania showed that patient delay was associated with the education level and unemployment especially among female patients (5). Another study conducted in Mwanza Tanzania also showed that longer patients delays were contributed to by residency i.e. rural vs urban and low level of education(2).

2.4 Facility factors

Availability and accessibility of proper TB diagnostic services are some of the factors that can result into client's health care seeking, diagnostic delays and treatment delays. At some Point health providers might not be available at the nearby facility or the diagnostic services may not be available to the clients following shortage diagnostic equipments. The health facilities may be very far from the respective community hence making it difficult to access the diagnostic services as well (12)(5).One study conducted in Dar es salaam Tanzania also showed that longer walking distance to a HCF was correlated with patient delay(11).

2.5 Roles of Community Health Workers

CHWs carries out community based TB activities according to National guidelines. Their roles includes to empower community members on TB , DR -TB and TB /HIV information through effective social mobilization, identify people with presumptive TB and refer or escort them to health facility, ensure referral feedback of presumptive case from health facility, ensure all TB cases are on treatment, supervise the patient and his/her treatment supporter

during treatment, collect and provide data to health facilities and CSOs implementing TB , TB /HIV and DR –TB(6).

Engagement of Community health worker in the identification of people with presumptive TB and refer or escort them to health facility refers to an active TB case finding approach which may positively contribute to reduced TB diagnostic delay that was found to be possibly resulting from passive case detection practice in one of the study conducted in Tanzania(11).A study conducted in Tanzania to look on the role of community based interventions in improving TB case detection found out that establishment of referral networks and other activities that bring TB information and services closer to those with symptoms, can contribute to improved TB case notification(16). This is also supported by another multicounty thematic review that found a significant increase in TB case detection and service utilization as a result of using CHW(17).

Though the studies above show that engagement of CHW can contribute to increased TB case detection a little is still known on the contribution of community health care workers on timing for TB management among PTB patients. This study will therefore look on the influence of community health care workers in TB management timing and come out with recommendations which will inform implementors at different levels as well as the future studies.

CHAPTER THREE

3.0 METHODOLODY

3.1 Setting

The study was conducted in Dar es Salaam Region covering all five municipals. Dar es Salaam region is located in the Eastern part of Tanzania and has a population of 4,364,541 (NBS, 2012). Of current the region has 5 administrative districts. According to the MoHCDGEC, Health facility Registry (HFR) the region has a total of 587 operating hospitals, health centres and dispensaries out of them 124 are public health facilities and 463 are private health facilities. Out of 124 public health facilities 13 are hospitals, 13 are health centres and 94 are dispensaries the remaining ones being maternity homes and clinics. Out of the 463 private health facilities 28 of them are hospitals, 67 are health centres and 272 are dispensaries the remaining ones being clinics, nursing homes and health labs. Dar es Salaam is the major contributor of TB cases notification.

3.2 Study Design

A facility based cross sectional study was conducted among pulmonary TB patients from selected health facilities.

3.3 Study population

The study population included 451 patients with pulmonary Tuberculosis attending TB clinic for treatment. Both initiation and continuation phase patients with pulmonary Tuberculosis were enrolled in the study.

3.4 Sample size and sample size estimation

Sample size estimation for TB patients was done at an assumption of 50% TB management delay as a confidence interval of 95% and 5% margin error. By taking these assumptions and considering the non-response of 10% then a minimal of **427** TB patients were aimed to be enrolled in the study.

$N = z^2 p\ (1-p)/E^2$

384 = 1.96^2*0.5(1-0.5)/0.05^2

Considering 10% non-response rate then the sample size will be;

427= 384*100/ (100-10)

3.5 Variables

3.5.1. Dependent variable

The study analysed one outcome/dependent variable which was timing for Tb management i.e. whether the patient's management was timely or delayed. Delay in TB management was categorised into health care seeking delay, diagnostic delay and treatment delays. *See details in the definition of terms.*

3.5.2. Independent variable

The main independent variable was whether or not a CHW was involved in referral or care before treatment initiation. From the Questionnaire CHW involvement was captured in question 22. This information was enquired from a client and verification of whether CHW was involved on the respective client's referral was done by cross checking with the client's treatment cards and TB registers at the clinic. Referrals from community health workers referred to patients found to have symptoms at the community by the CHW and then referred to the health facilities for care.

Patients socio–demographic characteristics were included amongst the independent variables. These included age (in years), Sex (male and female), marital status, education level and occupation.

Other measured independent variables were grouped into patient's, community related factors and facility's characteristics.

Community factors referred to the identified factors that can result to delays at the community level either resulting directly from the patient or as influenced by the presence of CHWs. Under this variable the measure was on either the CHW was engaged in the patient's referral for health care seeking, diagnosis and treatment.

Patients related community factors were measured by assessing the patient's knowledge and familiarity with TB symptoms, means of transmission and preventive measure. From the questionnaire, individual questions assessing the patient's knowledge are numbered 11 to 16. These questions were used to assess the patient's knowledge and if were aware of the symptoms, means of transmission and preventive measures even before visiting the health care facility.

Facility characteristics were assessed by looking on the timeliness of receiving TB diagnosis and treatment services from the 1st contact with the health facility.

3.6. Sampling procedure

Dar es Salaam region was purposively selected following the high TB notification rate, time factor and the budget constraints. All 3 TB reporting Regions (Kinondoni, Temeke and Ilala Districts) were included in the study. Facilities were stratified into Hospitals, health centres and dispensaries. From each TB reporting region, a designated regional hospital was purposefully included in the study. Other Hospitals apart from the regional hospital, Health centres and dispensaries were randomly selected from the list of facilities providing TB services through a simple random sampling in which 1 hospital, 2 health centres and 3 dispensaries were selected per district making a total of 21 health facilities.

The selected health facilities were used as an entry point to access TB patients. The number of TB clients were obtained from NTLP April – June2018 report for each sampled health facility. Then the number of clients to be included in the study from each facility were proportionally assigned to ensure that the sample the sample is a representative of all eligible TB patients in the respective facility.

3.7 Data collection instruments

Data collection was done by using tablets with a structured questionnaire through an ODK software. The questionnaire was developed in English and then translated to Swahili in order to allow better understanding among respondents during data collection. It was then entered into a data collection software which allowed access by each Research Assistant as well as the principle investigator. The questionnaire had various sections as follows;

3.7.1 Demographic Characteristics

Patients socio–demographic characteristics were recorded. These included gender (male and female), age (in years), education status (no education, primary, Secondary O- level as well as A- level and above higher), marital status (married, single, divorced, widow or cohabiting) and Occupation (unemployed/house wife, peasant, self-employed, employed skilled or unskilled provider, petty business and others)

3.7.2 Respondents knowledge on symptoms, mode of transmission and prevention of TB

Questions measuring knowledge on symptoms, mode of transmission and prevention of TB. Consisted of 3 key questions and 3 sub questions in between which assessed whether the patients were aware of at least one symptom before being diagnosed. These sub questions were asked so as to be able to assess the knowledge status between community and self-referral patients on TB symptoms, mode of transmission and prevention before visiting the heath care facilities. These questions were developed by adopting and modifying the TB knowledge assessment questions from the advocacy, communication and social mobilization for TB control guide to developing knowledge, attitude and practice surveys.(18). Since all core TB symptoms, mode of transmission and prevention are important in TB management patient who were able to mention at least one core symptom, mode of transmission or prevention was regarded as knowledgeable.

3.7.3. Influence of CHWs on timeliness for pulmonary tuberculosis care seeking, diagnosis and treatment

Under this section the study looked on the symptoms that lead to health care seeking, first place of seeking care and whether the community health care worker was engaged in referring

the patient to the health care facility. The questions also assessed the duration that were taken from the onset of symptom in order to establish the timeliness in care seeking among the interviewed patients. Apart from this timeliness for obtaining diagnostic results and treatment as facility factors that may impact in client's management were also assessed by directly asking the patient the time that was taken from visiting the health care facility for the first and receiving TB diagnosis as well as the time take from diagnosis to treatment initiation.

3.8 Inclusion Criteria

- Pulmonary patient on TB treatment
- Outpatient TB Client attending TB clinics
- Adults aged above 18 years

3.9 Exclusion criteria

- Relapse TB patients

3.10 Recruitment and training of research assistants

Five research assistants who are experienced in quantitative data collection and with good interpersonal skills from the National Institute for Medical Research (NIMR) were recruited. Research assistants received a one day orientation on the objectives and expectations of the study. They were familiarized with the questionnaire and how to maintain confidentiality.

3.11 Pretest of data collection tools

Pretest of data collection tools was conducted at Sinza hospital and Kigamboni health center in which a total of 10 patients per facility attending TB clinic for care and treatment were enrolled. Pretesting of the tools provided a clear indication on the response to the questionnaire including average time allocated for interviewing one respondent. Pretest results were used to improve the questionnaire so as to come up with the final tool.

3.12 Data collection Procedure

Structured interviews responding to the set of prepared questions were conducted to clients attending TB clinic for care and treatment. Questions were read out loudly to the clients and repeated if necessary, so as to ensure clear understanding and right responses. The Principle investigator (PI) and Research assistants were responsible for data collection from participants from the selected health facilities. Data were collected directly using the tablets through the ODK software were at the end of each day all data were synchronized and submitted. The principle investigator was able to access all data at the end of each data collection day.

3.13 Quality control

Recruitment and training of the research assistants before data collection improved accuracy and precision of the collected data. In additional to this, data collection tools were pre tested so as to improve the quality of the collected information. The pre-testing exercise also served as an orientation session to the research assistants. All necessary correction to the data collection tool was done before starting the actual data collection. All activities regarding data collection were under the monitoring and supervision of the principal investigator. Either, research team was conducting a meeting every evening after data collection to review the collected data and the PI was able to view and review the collected every evening and take corrective actions as need arose.

3.14 Data management

For data quality maintenance and consistency data generated were rechecked at on daily basis to ensure data correctness and completeness. Confidentiality was ensured and no one apart from the people involved in the research were allowed to access the research data. PI was responsible in ensuring all the data collection procedures are followed and data are well kept. Clients names were not included in the in the interview guide.

3.15 Data Entry

Collected data were extracted from the ODK system to the excel matrix where data cleaning was conducted and then analyzed using Statistical Package for Social Sciences for windows (SPSS). Data coding was done to allow computer entries of responses for open questions and combinations of multiple responses to respective questions in the questionnaire. In order to control for possible errors during data entry checking mechanisms were employed including spot checking and running intermediate frequencies.

3.16 Data analysis and interpretation plan

The SPSS statistical package was used for data analysis. Data were summarized by descriptive statistics. Dummy tables were prepared in advance to guide data analysis and each table was informed by the unit of analysis for the indicator in question and the type of information needed.

Data were analyzed objective wise. A bivariate analysis was carried out to examine the association between CHWs involvement in care seeking as well as timing for medical management. A multivariate analysis was carried out to adjust for individual patients, community and facility factors that influence timing for medical care. Descriptive analysis was conducted in all objectives i.e. Chi-square tests for categorical variables to examine associations between role of community health workers and delays after adjusting for facility's, individual's, and community's factors. For this logistic regression was first conducted to establish associations. Associations with $P<0.2$ was subjected into one model and multiple logistic regression analysis was therefore conducted to examine independent associations of each independent variable and outcome variable. In this way, it was possible to examine factors associated with delay to care at each level, i.e. health seeking (delay to health facilities), diagnosis and initiation of treatment. Results were reported in Odds Ratios and Adjusted odds ratios and associations were set at the significance level of 0.05.

3.17 Ethical Consideration

Ethical clearance was obtained from MUHAS Senate Research and Publications committee with ethical clearance no.DA.287/298/01A/ (Appendix IV). Following an introductory letter from MUHAS permission to conduct study in Dar as Salaam Region was sought from Regional Commissioner Office and Respective District Commissioner and Executive Directors office. Permission was as well sought from the Regional Medical Officers, Respective District Medical Officers and Hospital in-charges. All participants were informed about the research purpose and a written Informed consent was obtained from all participant before starting the interview. Participants were free to withdraw at any time of the study and no reason were ought if one opts to do so. Up to the end of the study no participant was reported to decline from taking part in the study. All measures were taken to ensure confidentiality as well adherence to client and human rights.

3.18 Dissemination of the research findings

The findings from this study will be shared to the Ministry of Health Community Development Gender Elderly and Children as well as Regional Authorities and respective District and Hospital authorities. The findings will as well be published in the academic journal and selected peer reviewed journals in order to help in findings disseminations to the policy and decisionmakers, donors as well as other researches who are interested in this study area.

CHAPTER FOUR

4.0 RESULTS

4.1 Characteristics of the respondents

Socio-demographic characteristics

As shown in table 1 below a total of 451 TB patients were enrolled in the study. Majority of the patients 69% were males. Most patients 40.7% were on the age group of 30-44yrs. The mean (SD) and Median age for males was 35.2 years and 32 years respectively. The mean and median age for females was 35.1 and 32.5 years respectively.

Table 1: Socio-demographic characteristics (N = 451)

Attribute	Total n=451	Percentage (%)
Age*		
18- 29 years	173	38.4
30-44 years	183	40.7
> 45 years	94	20.8
Gender		
Male	311	69
Female	140	31
Marital Status		
Single	191	42.4
Married	138	30.6
Divorced	60	13.3
Widowed	22	4.9
Co- habiting	40	8.9
Education Level		
No Education	49	10.9
Primary Education	298	66.1
Secondary education O - Level	82	18.2
Secondary education A- Level and Above	22	4.9
Occupation		
Unemployed/house wife/peasant	90	20
Self employed	111	24.6
Employed	93	20.6
Petty business	147	32.6
Others	10	2.2
Type of heath facility		
Hospital	240	53.2
Health Centre	108	24
Dispensary	103	22.8

*n= 1 was missing age; **n= 10 others included patients who reported to be retired and students

Symptoms V/S health care seeking Timing

Only about a half (52.1%) of the study participants sought care following prolonged cough other symptoms being in small percentages **(Table 2**). More than two thirds (71.6%) of the participants presented timely for care (in less than 30 days) to the health facilities. There was no significant difference between presenting symptoms with timing for health care seeking **(Table 2)**.

Table 2: Association between presenting symptoms with timeliness for health care seeking (N = 426)

	Total	**Health care seeking timing**		**X^2 (P-Value)**
		< 30 days	**> 30 days**	
Symptoms*	**n=426**	**n=305**	**n=121**	
Cough >2 weeks	229(52.1)	156(49.5)	73(58.4)	0.093
Sputum with Blood	43(10.0)	36(11.4)	7(5.6)	0.063
Breathing difficulty	14(3.2)	10(3.2)	4(3.2)	0.989
Fever	59(13.4)	44(14.0)	15(12.0)	0.585
Weight loss	21(4.8)	14(4.4)	7(5.6)	0.608
Chest Pain	26(5.9)	16(5.1)	10(8.0)	0.241
Night sweats	34(7.7)	29(9.2)	5(4.0)	0.065

*n= 25 were missing symptoms

Relationship of presenting symptoms with timelines in TB Management

More than half (57%) of the participants n=243(57%) delayed in receiving TB diagnosis and treatment i.e. took a duration of more than 5days. Two presenting symptoms were significantly associated with delays in receiving diagnosis and treatment **(Table 3);** namely fever (p=0.002) and chest pain (p=0.015).

Table 3: Symptoms V/S timeliness in TB diagnosis and treatment

	Total	Diagnosis and treatment timing		X^2 (P-value)
		<5 days	> 5 days	
Symptoms*	**n=426**	**n=183**	**n=243**	
Cough >2 weeks	229(52.1)	101(54.0)	128(50.6)	0.478
Sputum with Blood	43(9.8)	20(10.7)	23(9.1)	0.575
Breathing difficulty	14(3.2)	8(4.3)	6(2.4)	0.26
Fever	59(13.4)	14(7.5)	45(17.8)	0.002*
Weight loss	21(4.8)	7(3.7)	14(5.5)	0.384
Chest Pain	26(5.9)	17(9.1)	9(3.6)	0.015*
Night sweats	34(7.7)	16(8.6)	18(7.1)	0.576

*n=25 were missing symptoms

4.2 Type of referral among study participants

The study results showed that n =332 which equals to 73.6% of the interviewed participants were self-referrals while n= 93 which equals to 20.6% were referrals from the community health care workers. The remaining n=26 patients were referrals from ADDO shops and traditional healers.

4.3 Knowledge of TB symptoms, mode of transmission and treatment among the study participants

Comparing self from community referrals **(Table 4),** it was found that knowledge of TB symptoms was significantly better in self than community referrals with regard to prolonged cough ($p = 0.03$) and night sweats ($p = 0.001$). However, knowledge on early recognition of TB symptoms as a preventive measure was significantly better among community than self-referrals ($p = 0.001$).

Table 4: Knowledge on TB symptoms, means of transmission and prevention

	Total (Knowledgeable)	Self-referral(n=345)	Community referral (n=93)	X^2 (P-value)
Symptoms				
Cough >2 weeks	288(65.8)	236(68.4)	52(55.9)	0.03*
Sputum with Blood	76(17.4)	61(17.7)	15(16.1)	0.73
Breathing difficulty	46(10.5)	33(9.6)	13(14.0)	0.22
Fever	157(35.8)	129(37.4)	28(30.1)	0.19
Weight loss	89(20.3)	72(20.9)	17(18.3)	0.58
Chest Pain	52(11.9)	41(11.9)	11(11.8)	0.99
Night Sweats	234(53.4)	199(57.7)	35(37.6)	0.001*
TB symptom Awareness				
Yes	171(39.0)	136(39.4)	35(37.6)	0.75
Means of TB Transmission				
Through Air by coughing or sneezing	385(87.9)	304(88.1)	81(87.1)	0.79
Sharing eating utensils	20(4.6)	15(4.4)	5(5.4)	0.673
Living in a poorly ventilated room	43(9.8)	34(9.9)	9(9.7)	0.96
Means of Transmission awareness				
Yes	195(44.5)	155(44.9)	40(43.0)	0.74
Means of TB Prevention				
Early recognition of the symptoms	58(13.2)	36(10.4)	22(23.7)	0.001*
Early diagnosis and treatment	93(21.2)	67(19.4)	26(28.0)	0.07
Living in a house with enough air/ air circulation	34(7.8)	29(8.4)	5(5.4)	0.33
Avoiding overcrowding in an enclosed area	102(23.3)	82(23.8)	20(21.5)	0.65
Awareness of preventive measures				
Yes	146(33.3)	117(33.9)	29(31.2)	0.62

4.4 Timeliness in seeking care

Relationship between socio-demographic characteristic with timeliness in seeking care

Table 5 below shows the association between different attributed of socio-demographics with timelines in health care seeking. In general, most of the participants n=324 (72%) sought health care within 30 days from the onset of symptoms.

Table 5: Social demographic characteristics v/s timeliness in seeking care

Attribute	Total	Early (n=324) <30 days	Late (n=127) >30 days	X^2(p-value)
Age				
18- 29 years	173(38.4)	137(79.2)	36(20.8)	0.07
30-44 years	183(40.7)	123(67.2)	60(32.8)	
>45 years	94(20.8)	64(68.0)	30(32.0)	
Gender				
Male	311(69.0)	226(72.7)	85(27.3)	0.56
Female	140(31.0)	98(70.0)	42(30.0)	
Marital Status				
living together	231(51.22)	168(72.73)	63(27.27)	0.67
not living together	220(48.78)	156(70.91)	64(29.16)	
Education Level				
No Education	49(10.86)	32(65.3)	17(34.7)	0.56
Primary Education	298(66.08)	217(72.8)	81(27.2)	
Secondary education and above	104(23.06)	75(72.1)	29(27.9)	
Occupation				
Not working	87(19.29)	62(71.26)	25(28.74)	0.7
Petty business	205(45.45)	144(70.24)	61(29.76)	
Working	159(35.25)	118(74.21)	41(25.79)	
Type of heath facility				
Hospital	240(53.2)	177(73.6)	63(26.3)	0.33
Health Centre	108(24.0)	79(73.2)	29(26.8)	
Dispensary	103(22.8)	68(66.0)	35(34.0)	
Co-infection				
HIV	106(23.50)	74(69.81)	32(30.19)	0.19
Diabetes	8(1.77)	8(100.00)	0(0.00)	
Non	337(74.72)	242(71.81)	95(28.19)	

Relationship between type of referral with timeliness in health care seeking

The main independent variable was CHW engagement in patient's referral and how it contributes to health care seeking timing. For participants who attended the health facilities early the mean and median time interval between onset of symptom to first health facility consultation were 15.6 and 14 days respectively among self-referrals and 16.8 and 14 days respectively among community referrals. For Participants who delayed to seek health care the mean and median time interval between onset of symptoms to first health facility consultation was 93.6 and 60 days respectively among self-referrals and 97.3 and 60 days respectively among community referrals. From the results **table 6** below there was no significant relationship observed between health care seeking timeliness and the type of referral.

Table: 6 Type of referral v/s timeliness in seeking care

Variable	**Total**	**Early (n=324) <30 days**	**Late (n=127) >30 days**	**X^2(p-value)**
Self- referral	345(78.77)	250(72.46)	95(27.54)	0.49
CHW referral	93(21.23)	64(68.82)	29(31.18)	

4.5 Timeliness in TB diagnosis

Relationship between socio- demographic characteristics with timeliness in TB diagnosis

Table 7 below shows that only 42% of the study participants n =190 received their TB results timely from the 1st contact with the health facility for health care seeking.

Table 7: Social demographic characteristics v/s timeliness in TB diagnosis

Variable	Total	Early (n=190) < 5days	Late (n=261) >5days	X^2(p-value)
Age				
18- 29 years	173(38.4)	80 (46.2)	93(53.8)	0.16
30-44 years	183(40.7)	76(41.5)	107(58.3)	
>45 years	94(20.8)	33(36.2)	60(63.8)	
Gender				
Male	311(68.1)	133(42.8)	178(57.2)	0.68
Female	140(31.04)	57(40.7)	83(59.3)	
Marital Status				
living together	231(51.2)	94(40.7)	137(59.3)	0.53
not living together	220(48.8)	96(43.7)	124(56.4)	
Education Level				
No Education	104(23.1)	42(40.3)	62(59.2)	0.45
Primary Education	298(66.1)	131(44)	167(56)	
Secondary education and above	49(10.9)	17(34.7)	32(65)	
Occupation				
Not working	87(19.3)	34(39)	53(60.9)	0.28
Petty business	205(45.5)	81(39.5)	124(60.5)	
working	159(35.3)	75(47)	84(52.8)	
Type of heath facility				
Hospital	240(53.2)	120(42.5)	138(57.5)	0.7
Health Centre	108(23.1)	48(44.4)	60(55.6)	
Dispensary	103(22.8)	40(38.8)	63(61.2)	
Co-infection				
HIV	106(23.5)	47(44.3)	59(55.7)	0.84
Diabetes	8(1.8)	3(37.5)	5(62.5)	
Non	337(74.7)	140(41.5)	197(58.5)	

Relationship between type of referral with TB Diagnosis

From the results **table 8** below there was no significant relationship observed between the type of referral and TB diagnosis timing.

Table 8: Type of referral v/s timeliness TB diagnosis

Variable	Total	Early (n=190) < 5days	Late (n=261) >5days	X^2(p-value)
Self- referral	345(78.8)	149(43.2)	196(56.8)	0.56
CHW referral	93(21.2)	37(39.8)	56(60.2)	

4.6 Timeliness in TB treatment

Relationship between socio-demographic characteristic with timeliness in obtaining TB treatment

Results in Table 9 below shows that n=415 which equals to 92% of the study participants received TB treatment timely i.e. TB treatment was initiated on the same day of receiving their results. The results also show that there is a significant relationship between the type of health facility and treatment initiation timing p=0.00 whereby patient receiving care from the hospitals had the highest chance of being initiated treatment early if compared to other health facility levels (96.3%).

Table 9: Social demographic characteristics v/s timeliness in TB treatment

Variable	Total	Early (n=415)	Late (n=36)	X^2(p-value)
Age				
18- 29 years	173(38.4)	161(93.1)	12(6.9)	0.3
30-44 years	183(40.7)	166(90.7)	17(9.3)	
45-64 years	94(20.8)	87(92.6)	7(7.4)	
Gender				
Male	311(69.0)	284(91.3)	27(8.7)	0.41
Female	140(31.0)	131(93.6)	9(6.4)	
Marital Status				
Living together	231(51.2)	214(92.6)	17(7.4)	0.62
Not living together	220(48.8)	201(91.4)	19(8.6)	
Education Level				
No Education	49(10.9)	48(97.1)	1(2.04)	0.12
Primary Education	298(66.1)	275(92.3)	23(7.7)	
Secondary education and above	104(23.1)	92(88.5)	12(11.5)	
Occupation				
Not working	87(19.3)	83(95.4)	4(4.6)	0.32
Petty business	205(45.5)	189(92.2)	16(7.8)	
Working	159(35.3)	143(89.9)	16(10.1)	
Type of heath facility				
Hospital	240(53.2)	231(96.3)	9(3.8)	0.00*
Health Centre	108(23.1)	90(83.3)	18(16.7)	
Dispensary	103(22.8)	94(91.3)	9(8.7)	
Co-infection				
HIV	106(23.5)	99(93.4)	7(6.6)	0.18
Diabetes	8(1.8)	6(75.0)	2(25.0)	
Non	337(74.7)	310(91.1)	27(8.0)	

Relationship between type of referral with TB treatment initiation

Table 10 below shows that there is a significant relationship between type of referral and treatment initiation timeline p=0.02 where self-referral patients (93.3%) have the highest chance of being initiated treatment early than community referrals.

Table 10: Type of referral v/s timeliness TB treatment

Variable	**Total**	**Early (n=415)**	**Late (n=36)**	**X^2(p-value)**
Self- referral	345(78.8)	322(93.3)	23(6.7)	0.02*
CHW referral	93(21.2)	80(86.0)	13(13.1)	

Logistic regression analysis to assess the association between type of referral with TB treatment initiation

Results from table 11 below shows that study participants who made self-referral have 2.5 times increased chance of receiving treatment early as compared to the community referrals.

Table 11: Association between CHWs referrals and timeliness in obtaining treatment of PTB Patients

Factor	Total PTB Patients received treatment earlier	Crude Odds Ratio(95%CI)	P-value	Adjusted Odds Ratio (95%CI)	P-value
Education					
Secondary education and above	92(88.5)	1			
Primary Education	275(92.3)	1.6(0.7 - 3.3)	0.237		
No Education	48(97.1)	6.3(0.8 - 49.6)	0.082		
co-infection					
Diabetes	6(75.0)	1			
HIV	99(93.4)	4.7(0.8 - 27.8)	0.087		
Non	310(91.1)	3.8(0.7 -19.9)	0.11		
Distance to the health facility					
Near	271(89.7)	1			
Far	144(96.6)	3.3(1.2 - 8.6)	0.016	3.4(1.3 - 9.1)	0.013
Referral					
self- referral	322(93.3)	1			
CHW referral	80(86.0)	0.4(0.2 - 0.9)	0.026	0.4(0.2 -0.89	0.025

CHAPTER FIVE

5.0 DISCUSSION

5.1.General Findings

More than two third of the study participants were males as shown in similar studies (11)(3)(19). Although this study did not look at the factors that might be contributing to higher rates of TB among men the findings implies that there is a need of reaching out more males with the gender focused TB interventions so as to reduce the rate of TB transmission.

In comparing the percentage of community and self-referrals it was found out that 20.6% of the study participants were referrals from the community health care workers. The noted percentage of community contribution is slightly higher than the 2014 Ministry of health data which reported 19% community contribution percentage(6). This finding confirms that Dar es Salaam region has an ongoing community health workers engagement in active TB case finding which in turn contributes to increased TB case notification.

5.2.Knowledge of TB symptoms, mode of transmission and prevention among the study participants

In this study it was found out that a low percentage of the participants were knowledgeable of TB symptoms, mode of transmission and prevention before visiting the health facilities. Low percentage of TB symptoms recognition is also seen in other studies conducted in Tanzania by Mfinanga et all (5) and Ngadaya et all (3). These results imply that more efforts are still needed in implementing SBCC interventions so as to improve community members knowledge on TB symptoms, means of transmission and prevention and hence decrease the rate of TB transmission at the community level.

In comparing the Community referrals and self-referrals, TB symptoms knowledge was significantly higher in self-referrals than community referrals with regard to prolonged cough and night sweats. This finding indicates that most of TB patients being referred to the health facilities by community health workers have poor TB Knowledge hence the presence of

Community health workers may improve their contact with the health care facilities. Studies highlights that patients with poor knowledge on Tuberculosis are more likely to stay longer at the communities and hence increase the rate of TB transmission to other community members as well morbidities and mortalities(12)(5)(3). The fact that most of the community referrals had less knowledge on TB may be implying that without any intervention this group may tend to delay in seeking health care if compared to self-referrals.

5.3.Timeliness in seeking care

In this study timeliness in health care seeking referred to the number of days lapse from symptom recognition to 1st health facility attendance whereby the period below 30 days is considered as no delay and the period above 30 days being considered as delay. The same duration was used in the studies conducted in Pwani and Mwanza regions by Ngadaya et al.in 2009 and Wandwalo et al., 2000) respectively(3)(2).

Delay in health care seeking was observed in 28% of the patients and there was no significant relationship between socio-demographic characteristics with timelines in health care seeking. The percentage (28%) in care seeking is slightly low compared to the findings by Mfinanga et al, 2008. in Dar es salaam and very low compared to the findings by Wandwalo et al, 2000 in Mwanza region(5)(2). The observed differences might reflect on the ongoing National efforts of TB awareness raising campaigns to the communities through different channels as well as expansion of TB service coverage at the health facilities. This difference may also be contributed by the socio demographic characteristic i.e. rural versus urban settings as well as readily availability of health services in urban areas compared to rural settings.

Although a large proportion of self-referrals 72.46% attended the health facilities within 30 days of symptoms onset if compared to 68.82% of community referrals the study findings showed no significant relationship between type of referral (community referrals versus self-referral) and timeliness in health care seeking. The observed percentage of delay among the community referral if compared to the results in section 5.2. above which indicates low TB symptoms knowledge among this group supports the fact that people with poor knowledge on

TB symptoms tends to stay longer at the community before visiting the health care facilities. This might be showing the importance of community health workers in reaching out this group and refer them to the health care facilities as stressed in the National Operational Guideline for Community Based TB,TB/HIV and DR-TB Interventions(6).

5.4.Timeliness in TB Management

In this study timeliness in TB management was used to establish the extent of health facility delay where health facility delay refers to number of days lapse from first attendance to health facility to initiation of ant TB therapy, the period of below 5 days being considered as not delayed and the period of above 5days being considered as delayed.

As guided by the National Guidelines for TB care and treatment it is expected that a patient will be initiated treatment upon confirmation of the diagnosis, this is expected to be on the same day of receiving the diagnostic results(1). To establish this patient were first asked on the duration of receiving TB diagnostic results from the time when they first contacted the health facilities and whether treatment was initiated upon confirmation of the diagnosis.

Timeliness in TB diagnosis

The study findings showed that only 190/451 (42%) of the study participants received their TB diagnostic results timely from the time when they first contacted the health facility for health care seeking meaning that more than half (58%) of the patients delayed to receive their results. This finding is consistent with the findings from the study which was conducted in Pwani region which showed a delay among 58.7% of the interviewed patients(3) and slightly higher compared to another study conducted in Dar es Salaam which showed a diagnostic delay in 52.9% of the patients(5). The fact that TB diagnostic delay is still observed among TB patients calls for a need of ensuring that health care workers are empowered to identify TB signs and symptoms as early as possible so as to decrease the rate of continued TB transmission at the community level. Providers from each facility visited by the patient for the first time whether private or public should be able to rule out the signs and symptoms of TB so as to reduce the

chances of delayed diagnosis among patients seeking health care, thus limiting TB transmission.

Further the study showed no significant relationship between community health workers engagement (community referrals) and TB diagnosis timing. This could be due to the fact that patient handling after reaching the health care facilities is expected to be equal regardless of the type of referral and will mainly be influenced by the availability of TB diagnostic services in the respective facility. Community health care workers are mostly expected to work at the communities so as to increase the number of notified TB cases and in turn reduce the rate of TB transmission.

Timeliness in TB treatment

Study findings showed that majority, 415/451 (92%) of the study participants received TB treatment timely i.e. TB treatment was initiated on the same day of receiving their results. This implies that most of the health care providers understands the National recommendations of ensuring that patients are initiated treatment upon confirmation of the diagnosis and more efforts are needed in order to ensure that all confirmed TB patients are initiated treatment timely. This finding is slightly lower than the one found in the study conducted in Dar es Salaam where 100% of the patients were put on treatment within 1 day of confirming TB diagnosis(11) but higher than the percentage found in another study conducted in Dar es Salam by Mfinanga et al.2008(5).

The results also show that there is a significant relationship ($p < 0.001$) between the type of health facility and treatment initiation timing where patient receiving care form the hospitals had the highest chance of being initiated treatment early if compare to other health facility levels. This can be contributed by readily availability of skilled health care providers as well as TB medication at the hospital level if compared to the lower level facilities. This finding implies that there is a need of ensuring that lower level facilities are well equipped so as to enable timely initiation of treatment at this level.

While comparing treatment initiation timing between self and community referrals a significant relationship ($p < 0.05$) was noted between the type of referral and treatment initiation timeline. -Self-referral patients showed the highest chance of being initiated treatment early as compared to community referrals. Further multivariate analysis showed that study participants who made self-referral had 2.5 times increased chance of receiving treatment early as compared to the community referrals. This could be due to the fact that some of the community referrals depends on receiving results from community health worker who at times have to follow them at their residencies while self-referral will always follow results at the health facilities on their own and hence be initiated treatment upon receival of the diagnostic results. This can be reduced by ensuring that all TB suspect are insisted to show up at the health facilities on the day of receiving their diagnostic results so as to increase the chance of being initiated treatment on the same day.

5.5.Study limitation

- Some of the patients may have failed to give out correct information due to the fear of being mistreated by the health care providers, to mitigate this high confidentiality and privacy was ensured during the data collection exercise and assurance was given to the patients that the given information will be treated with high level of confidentiality.
- Some of the patients may have unknowingly gave out incorrect information due to limited understanding and failure to clearly recall especially the on the duration (from symptom onset to health care seeking) to mitigate this the knowledgeable research assistants were used and were well oriented on the questions so as to ensure clarity and consistency when asking questions to the patients. Additionally, questions were asked in a way that could not influence the patient's response and the study did not include TB relapse cases who may have the high chance of mixing the TB episodes.

CHAPTER SIX

6.0CONCLUSSION AND RECCOMENDATIONS

6.1. Conclusion

The study found out that community TB interventions are existing in Dar es Salaam region, whereby 20.6% of the study participants were community referrals. It was observed that knowledge on TB symptom, mode of transmission and prevention is still low among the community members especially among the community referral cases. Most of the patients presented at the health facilities within 30 days and health facility delay in terms of TB diagnosis timelessness is still high whereby more than half (58%) of the patients delayed to receive their TB results from when they first contacted the health facilities, there was no significant relationship between community health workers engagement and health care seeking timeliness or TB diagnosis timing. Looking at the treatment timing it was observed that self-referrals have 2.5 times increased chance of receiving treatment timely if compared to community referrals.

From the study findings community health care workers were found not to influence the timing for TB management though they show to reach out the higher proportion of patients with low knowledge on TB symptoms. This finding shows that community health care workers tend to reach the population with poor knowledge on TB symptoms who have higher chance of delaying in seeking care and thus contribute to transmission of TB in the community. This would implicitly improve their contact with the health care facilities thus increasing the rate of TB case detection and notification.

6.2. Recommendations

Engagement of community health care workers is important in reaching out the community members with low TB knowledge so as to reduce the rate of TB transmission at the communities hence the community programs should be strengthened so as to ensure wide coverage and early detection of the missing TB cases.

Public education on prolonged cough and night sweats as the core symptoms of PTB should be strengthened, since most of the patients still have low knowledge and tend to learn about the signs, symptoms and means of TB prevention after visiting the health care facilities.

Since the study findings showed health facility delay in TB Management especially on the diagnosis there should be programs which will ensure that health care providers are regularly updated on the signs and symptoms of TB so as to enhance their capacity of picking up TB symptoms early in all facility entry points especially when the patient makes the first health facility contact.

Further follow up studies are recommended so as to be able to show the exact influence of CHWs on the timing for TB management as well as examine the reasons for delays in receiving TB diagnosis services despite timely presentation at the health facilities.

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APPENDICES

Appendix I: Consent Form English Version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES(MUHAS) DIRECTORATE OF RESEARCH AND PUBLICATIONS.

TITLE OF THE STUDY: INFLUENCE OF COMMUNITY HEALTH WORKERS ON TIMING FOR TB MANAGEMENT AMONG PATIENTS WITH PULMONARY TUBERCULOSIS IN DAR ES SALAAM, TANZANIA.

ID NO……

Consent to Participate in the Study

Greeting! My name is Dr. Happiness Willbroad from MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES, MPH Candidate. I am conducting a study with the objectives of determining the influence of CHWs in timing for TB management among PTB patients in Dar es Salaam.

Purpose of the Study

The purpose of the study is to collect information that will help to determine the influence of CHWs in timing for TB management among PTB patients in Dar es Salaam.

The result of this study will inform the Regional Health Management Teams and decision makers at the Ministry of Health Community development, Gender, elderly and children (MoHCDGEC) through National Tuberculosis and Leprosy Programme (NTLP) on the influence of CHWs in TB management timing among PTB patients for proper planning. It will also give highlights to other implementers and donors working Tuberculosis interventions on

the areas that may need more attention in order to improve access to care for Tuberculosis patients.

Participation requirement

If you agree to participate in this study you will be required to fill or answer questions intending to determine the influence of CHWs in timing for TB management among PTB patients in Dar es Salaam.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have access to the information. We will be compiling a report which will contain responses from the people interviewed without any reference to individuals. We will not put your name or other identifying information on the records of the information you provide.

Benefits

The information you provide will help in providing recommendations mainly to the Regional Health Management team and Ministry of Health Community development, Gender, elderly and children through National Tuberculosis and Leprosy Programme (NTLP) as well as other implementing partners and stakeholders working in the region for them to know influence of CHWs in timing for TB management hence plan for the best ways of improving TB service accessibility to the communities.

Potential Risks

I assure you that no risk will arise from participating in this study and that your contribution is highly valuable.

Rights to withdraw and alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent.

Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Contacts

If you ever have questions about this study, you should contact the principal investigator, Dr. Happiness Willbroad Muhimbili University of Health and Allied Sciences (MUHAS), P.O.Box 65001, Dar es Salaam, Mobile phone no: 0762103363

If you ever have questions about your rights as a participant, you may contact Dr. Bruno Sunguya, Chairperson of the Senate Research and Publications Committee. O. Box 65001, Dar es Salaam. Tel: 2150302-6 and Prof. D. Tarimo Tel :(+255 754 578 528) who is the supervisor of this study.

I_____have read/listened to the contents in this form. I agree to participate in this study.

Signature of the respondent _____

Signature of Principal Investigator _____

Date of Signed consent _____

Appendix II: Structured Questionnaire– English Version

Questionnaire number: _____

Interview Schedule for Patients on the influence of Community Health Workers on Timing for TB Management among Patients with Pulmonary Tuberculosis in Dar es Salaam, Tanzania

Patient Identification Number _____

Introduction: We are researchers from MUHAS, conducting a research on the role of CHWs in identifying and referring patients with symptoms of TB for a timely diagnosis and initiation of treatment. Such information will guide policy makers on how to scale up and maintain CHWs in the system of timely identification of patients with TB. Please allows and we shall thank you availing some time to participate in an interview regarding the processes you took from symptom onset till obtaining treatment for TB.

Research Objectives

1. Characteristics of the respondent (including clinical: other co-infections etc.)
2. CHWs influence on the respondents' knowledge on symptoms, mode of transmission and prevention of TB
3. Influence of community referrals on timeliness for PTB care seeking
4. Influence of community referrals on timeliness for obtaining a laboratory diagnosis of PTB
5. Influence of community referrals on timeliness for obtaining treatment for PTB

Quest. No	Question	Coding Category	Skip
	Interviewee initials	**Fill**	
	Identification Number ……		
A. Characteristics of the respondent (including clinical: co-infections)			
1	Region	_____Name	
2	District:	_____Name	
3.	Health Facility	_____Name	
4	Gender	1. Male 2. Female	
5	Age	Fill in _____	
6	Level of education	1. No education 2. Primary 3. O- Level 4. Secondary A- level and above	
7	Marital status	1. Married 2. Single 3. Divorced	

		4. Widowed 5. Co-habiting	
8	Occupation	1. Unemployed/house wife 2. Peasant 3. Self employed 4. Employed skilled provider 5. Employed unskilled provider 6. Petty business 7. Others	
10	Co Infection	1. HIV 2. Diabetes 3. Other 4. Non	
B. Objective 1: CHWs influence on the respondents' knowledge on symptoms, mode of transmission and prevention of TB			
11	What do you consider to be the symptoms of TB?	1. Cough >2 weeks 2. Sputum with Blood 3. Breathing difficulty 4. Fever 5. Weight loss 6. Chest Pain 7. Night Sweats 8. Others 9. None	
12	Was you aware of these symptoms before being diagnosed?	1. All 2. Some 3. Non	

13	In which ways do you think TB can be transmitted?	1. Through Air by coughing or sneezing 2. Mosquito bite 3. Sharing eating utensils 4. Sharing of sharps 5. Mother to Child 6. Unpasteurized milk 7. Living in a poorly ventilated room 8. Blood transfusion 9. Don't Know 10. Others …….	
14	Was you aware of the mentioned means of TB transmission before being diagnosed?	1. All 2. Some 3. Non	
15	In which ways do you think TB can be prevented	1. Early recognition of the symptoms 2. Early diagnosis and treatment 3. Living in a house with enough air/ air circulation 4. Avoiding overcrowding in an enclosed area 5. Others …… 6. Don't Know	
16	Was you aware of the mentioned means of TB prevention before being diagnosed?	1. All 2. Some 3. Non	

C. Objective 2: Influence of community referrals on timeliness for PTB care seeking			
17	What symptoms made you seek health care?	1. Cough 2. Sputum with Blood 3. Breathing difficulty 4. Fever 5. Weight loss 6. Chest Pain 7. Night sweats 8. Others	
18	Where did you first seek treatment when after experiencing the symptom mentioned in above?	1. ADDO shop 2. Traditional healers 3. Government health facility 4. Private health facility 5. Religious Leaders 6. Other	
19	What made you seek care from that place at first?	1. Was cheaper 2. Was closer 3. More convenient schedule 4. Better care received 5. Better attitude form health workers 6. Trusted more 7. Others…….	

20	Did you thought that you might be having TB after experiencing the mentioned symptoms?	1. Yes 2. No	If Yes go to Qn. 21 If No go to Qn. 22
21	If No. what disease did you thought you might be having?	Mention …….	
22	How did you decide to visit the health care facility?	1. Self-decision/ referral 2. Referral from community Health Worker 3. ADDO referral 4. Traditional healer referral 5. Others …….	
23	How long did it take from the onset of symptom to health care seeking at the health facility?	1. ……Days 2. ……. weeks 3. ……. months	If more than 30 days go to Qn. 24 If less than 30 days go to Qn. 25

24	If question 23 above is more than 30 days then enquire more on what lead to delay in health care seeking	1. Hoping the symptoms will go away 2. Fear of being diagnosed 3. Fear of being tested for HIV 4. Economic constraints 5. Poor quality of health services 6. Lack of transport to the health facility 7. High transport cost 8. Lack of time to visit the health facility 9. Others……	
D. Objective 3: Influence of community referrals on timeliness for obtaining a laboratory diagnosis of PTB			
25	Where you suspected to have TB on your 1st health facility visit?	1. Yes 2. No	If yes go to Qn.27 If no go to Qn.26
26	If no. then at which visit where you suspected to have TB	1. 2nd 2. 3rd 3. 4th and above	
27	How long did it take since you first sought health care until when you were diagnosed with TB?	1. ……Days 2. ……. weeks 3. ……. months	
28	Was the diagnosis made at the facility that you visited for the 1st time or you	1. Yes 2. No	If Yes go to Qn. 29

	were given referral to another facility for diagnosis?		If no. go to Qn. 28a
28a	What was the reason that made you change the health facility?	1. I was referred from another facility 2. I decided to change the facility on my own 3. I was advised by my relatives 4. I was advised by the community health care worker 5. Don't remember 6. Other	
29	Was the diagnosis made at this facility which your receiving treatment from?	1. Yes 2. No	If yes Skip Question 38 to 41
30	How far is your home from the diagnostic facility health facility? (distance or time)	_____Time (Minutes or hours) _____Kms	
31	Which means of transport did you use to reach the diagnostic facility?	1. Working 2. Bicycle 3. Motorcycle 4. Public transport 5. Private transport 6. Others	

32	Did you have to pay for transport to get to the diagnostic facility?	1. Yes 2. No	If Yes go to Qn. 33 If No. go to Qn. 34
33	How much did you have to pay for transport?	Mention _____	
E. Objective 4: Influence of community referrals on timeliness for obtaining treatment for PTB			
34	How long did it take from being confirmed to have TB to treatment initiation?	1. Treatment initiated on the same day 2. ……Days 3. ……. weeks 4. ……. months	If treatment was not initiated on the same day then go to Qn. 35
35	Why did you delay to start treatment?	Mention _____ _	
36	Is this the nearest health facility from your home?	1. Yes 2. No	

37	If no then why did you choose to come to this health facility for treatment?	1. Availability of treatment services 2. Been here before 3. Friend/ family recommend 4. Referred from other facility 5. Referred by a community health worker 6. Know provider 7. Good provider attitude 8. Other	
38	How far is your home from this health facility? (distance or time)	_____Time (Minutes or hours) _____Kms	
39	Which means of transport do you use to reach this health facility?	1. Working 2. Bicycle 3. Motorcycle 4. Public transport 5. Private transport 6. Others	
40	Do you have to pay for transport to get to this health facility?	1. Yes 2. No	
41	How much did you have to pay for transport?	3. Mention _____	

Appendix III: Approval of ethical clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz

Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. DA.287/298/01A/

12th July, 2018

Ms. Happiness Willbroad
MPH-Distance Learning
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "INFLUENCE OF COMMUNITY HEALTH WORKERS ON TIMING FOR CARE AMONG PATIENTS WITH PULMONARY TUBERCULOSIS IN DAR ES SALAAM, TANZANIA"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 11th July, 2018 to 10th July, 2019. In case you do not complete data analysis and dissertation report writing by 10th July, 2019, you will have to apply for renewal of ethical clearance prior to the expiry date.

Prof. P. Muganyizi
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences

Appendix IV: Research permits

KIGAMBONI MUNICIPAL COUNCIL

[All letters should addressed to Municipal Director of Kigamboni]

Tell: +255 22-2928468
Fax: +255 22-2928469
E-mail: info@kigamboni.go.tz
Tovuti: www.kigamboni.go.tz

P.O.Box 36009,
KIGAMBONI,
DAR ES SALAAM,
TANZANIA.

Ref. No. .....

Date: 14/08/2018

To..INCHARGE KIGAMBONI H/C
P.O. Box ...36009.....,
DAR ES SALAAM

Dear Sir/Madam

REF: PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES IN KIGAMBONI MUNICIPALITY

Please refer to the above heading.

Extension of permission has been granted to Mr/~~Mrs~~/~~Miss~~/~~Prof~~/Dr..HAPPINESS....WILLBROAD.. from (institution)MUHIMBILI UNIVERSITY address ..... For Tel No. to collect data for research.

The research title is Influence of Community health Care workers on timing ...for care among patients with pulmonary TB.....
.....
She/he has submitted the proposal for the mentioned study to the MMOH Office as a pre – condition prior to authorization.

The researchers have been instructed and agreed to submit the research progress reports and final results to the MMOH prior to any publications Data collection will restart on 13/08/018 to .21/09/018 sample size .....

This research work is part of Academic for fulfillment for Diploma/Advanced Diploma/Degree/Master/PHD it is part on going research in your Institution.

Your sincerely.

For: MUNICIPAL MEDICAL OFFICER OF HEALTH KIGAMBONI

Digna Zenda
FOR. DISTRICT MEDICAL OFFICER
KIGAMBONI MUNICIPAL COUNCIL

KINONDONI MUNICIPAL COUNCIL

ALL CORRESPONDENCED TO BE ADDRESSED TO THE MUNICIPAL DIRECTOR

Tel: 2171022
Fax: 2172951

Unapojibu tafadhali taja :

Kumb. Na. PF/K/14.Vol.VI/

MUNICIPAL MEDICAL OFFICER OF HEALTH,
KINONDONI MUNICIPAL COUNCIL
P. O. BOX. 61665,
DAR ES SALAAM.

Date: 16/8/2018

Health Facility I/C.

Mwenyamaki hsp, Magomeni health Centre, Bunju Disp and Tandale H-C
Kinondoni Municipal.

REF: RESEARCH WORK PERMIT.

Refer to the above heading.

DMO office is pleased to inform you health facility that Happiness Willbroad which is/from Muhimbili University of Health and Allied Sciences has been given a permit to perform the research work in your facility stating from 16/8/2018 to 21/9/2018 the research is Titled.
Influence of Community Health Workers on Timing of Care Seeking Patients with Pulmonary Tuberculosis in Dar es Salaam Tanzania

Kindly receive & provide the necessary assistance in order to enable the student/organization to fulfill the activities comfortably.

Best wishes.

Kny: MGANGA MKUU WA MANISPAA
KAIMSHAURI YA MANISPAA YA KINOND

RESEARCH COORDINATOR
KINONDONI MUNICIPAL COUNCIL

N:B Please share research report with MMOH Office at the end of your study.

HALMASHAURI YA MANISPAA YA ILALA

BARUA ZOTE ZIPELEKWE KWA MKURUGENZI WA MANISPAA

SIMU NA. 2128800
2128805
FAX NO. 2121486

OFISI YA MKURUGENZI
I MTAA WA MISSION
S.L.P 20950
11883 – DAR ES SALAAM

KUMB. NA. IMC/AF.3/31

...15.../..03./2018

HEALTH FACILITY...NO. CHARGE.....AMANA HOSPITAL/

..MNAZI MOJA...HOSPITAL/...BUGURUNDI HC/BUGURUNDI ANGLICAN HC/

....CHANIKA...DISPENSARY/TABATA...A. DISPENSARY/MAGEREZA UKONGA DISPENSARY

YAH: KUWATAMBULISHA...DR...MAPUNGA....MWIBADA.....

Husika na mada tajwa hapo juu.

Halmashauri ya Manispaa ya Ilala imeruhusu Wa... toka....LIMA....KUSOMA.....NA....MWIHIMBILI..... kufanya 'Project/~~Field~~/Research' juu ya..TS...Mchango wa watumishi wa afya ngazi ya jamii.....katika ofisi yako. "**Project/~~Field~~/Research**" itaanza kuanzia tarehe ..16...../...03..2018 hadi...21...../.....09.....2018.

Orodha ya majina yao imeambatanishwa na barua hii.

Tafadhali wape Ushirikiano.

Nakutakia kazi njema.

PP

Kny: MKURUGENZI
HALMASHAURI YA MANISPAA YA ILALA

R. Muna,
Kny: MKURUGENZI WA HALMASHAURI
MANISPAA YA ILALA

TEMEKE MUNICIPAL COUNCIL

ALL COMMUNICATIONS TO BE ADDRESSED TO MUNICIPAL DIRECTOR

P.O.Box. 45232
Tel: 2850142

TEMEKE MUNICIPAL MEDICAL
OFFICE OF HEALTH
DAR ES SALAAM
TANZANIA.

Date: 14/08/018

MO'C
TEMEKE HOSP, MBAGALA HOSP
YOMBO VITUKA HC, TAMBOKAKELI HC
KEKO PRISON DISP AND
KIZUIANI DISP.

REF; PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES IN TEMEKE MUNICIPALITY.

Please refer to the above heading.
Extension of Permission has been granted to Mr./Mrs./Ms./Prof./Dr. HAPPINESS WILLBROAD from (Institution) MUHAS Address DSM to Tel. No to collect data for research work in your area.

The research title is Influence of Community Health care workers on timing for care among patients with pulmonary Tuberculosis in Dar es Salaam
She/he has submitted the proposal for the mentioned study to the MMOH Office as a pre-condition prior to authorisation.

The researchers have been instructed and agreed to submit the research progress reports and final results to the MMOH prior to any publications.

Data collection will restart on 15/08/018 to 21/09/018
Sample size /

This research work is part of Academic fulfilment for Diploma/Advanced Diploma/Degree/master /PhD it is part of ongoing research in your institution

I am kindly requesting you to give him/her the necessary assistance so as to accomplish this task timely.

Yours Sincerely

FOR MUNICIPAL MEDICAL OFFICER
OF HEALTH
TEMEKE

AGNES KYAMBA
For; Temeke Municipal Medical Officer of Health

UBUNGO MUNICIPAL COUNCIL

ALL CORRESPONDENCES TO BE ADDRESSED TO THE MUNICIPAL DIRECTOR

Tel: 022296341

Fax

In reply please quote:

Ref. No. UBMC/MED/TRA/78

THE OFFICE OF MUNICIPAL MEDICAL OFFICER
OF HEALTH
UBUNGO MUNICIPAL COUNCIL

P. O. BOX 55068
DAR EA SALAAM
Date 17/08/2018

Facility In Charge
Sinza Hospital

RE: PERMIT TO CONDUCT RESEARCH

Refer to the above heading.

DMO's office is pleased to inform you that Dr Happness Willbroad from Muhimbili University of Health and Allied Science his given a permission to conduct Research on "**Influence of Community Health Workers on Timing for Care among Patient with Pulmonary Tuberculosis in Dar-es-salaam. "** in your facility.

Kindly receive and provide the necessary assistance in order to enable him to fulfill the activities comfortably.

Best Regards,

Mwambije

Training/Research Coordinator Health

Ubungo Municipal Council

NB: Please share Research report with MMOH Office at the end of your study.