Knowledge and Practice of Private Medical Practitioners Regarding Diagnosis and Treatment of Paediatric Tuberculosis in Mogadishu.

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A dissertation submitted in partial fulfillment for the award of the Degree of Masters of Medicine in Pediatrics and child health at the University of Nairobi

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DECLARATION

This dissertation is submitted as my original work and has not been presented for a degree elsewhere.

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APPROVAL

This dissertation has been submitted for examination with our approval as university supervisors.

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DEDICATION

This thesis is dedicated to my wife and my children for their support and patience throughout the period of my postgraduate program.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BCG	Bacillus Calmette-Guérin
CNS	Central nervous system
CT	Computed Tomography
CXR	Chest X-Ray
DOTS	Directly Observed Therapy Shortcourse
ESR	Erythrocyte Sedimentation Rate
FDC	Fixed Dose Combination
FTT	Failure to Thrive
HIV	Human Immunodeficiency Virus
IDP	Internally Displaced People
MDG	Millennium Development Goals
MDR TB	Multi-Drug Resistant Tuberculosis
NLTP	National Leprosy and Tuberculosis Program
NTP	National Tuberculosis Programs
PPM	Public Private Mix
PPs	Private Practitioners
PTB	Pulmonary Tuberculosis
TB	Tuberculosis
TST	Tuberculin Skin Test
WHO	World Health Organization

ABSTRACT

Background: Tuberculosis (TB) remains one of the major health problems and the second leading infectious cause of mortality around the world. According to WHO estimates in 2011, there were 0.5 million new cases of TB and 64 000 deaths due to TB diseases in children. Somalia has been at civil war for the last two decades and the health system was virtually collapsed. The majority of the community seeks care from the private health sector.

Objectives: To assess the knowledge and practice of private medical practitioners concerning paediatric tuberculosis diagnosis and treatment in Mogadishu and their level of adherence to the National or International guidelines.

Methods: A cross-sectional study was conducted among 39 private medical practitioners from Mogadishu. Pre-tested questionnaire was used to collect the information. The researcher also collected 48 different prescriptions written by different clinicians to determine the practice of clinicians toward paediatric TB and to the adherence of the National or International guidelines.

Results: The majority of the private medical practitioners expressed that fever for more than 2 week (87.19%), cough for more than 2 week (89.74%) and loss of weight (92.31%) will led them to suspect TB disease in children. But few of them 5 (12.82%) mentioned that they use history of TB contact as a suspicion of paediatric TB. More than half of the practitioners 21(53.85%) relied on CXR and ESR for the diagnosis of tuberculosis in children. None of the clinicians considered Mantoux test as a tool for investigation of TB in children. About 60% of the clinicians did not knew or not recommended the appropriate regimens for extra-pulmonary TB, while 79.49% did not know the recommended treatment of TB/HIV co-infection. Of the 48 prescriptions collected, only one prescription was correctly prescribed according to the weight of the child. Only 18 (39 %) of the anti-TB drugs prescribed were Fixed Dose Combination approved by the WHO.

Conclusions: Private medical practitioners in Mogadishu have significant gaps in their knowledge and practice in regards to management of paediatric tuberculosis. Significant omissions are failure to consider history of TB contact as an important symptom by 80% of the practitioners, lack of utilization of Mantoux test as an investigative tool for TB in children and almost universal (98%) incorrectly prescribed TB drug doses according to the weight of the child.

Recommendation: The Ministry of Health in Somalia should establish continues medical education to the private medical practitioners in Mogadishu.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by mycobacterium tubercle. It primarily affects the lungs, but also affects other organ systems like the central nervous system, intestine, bones and other tissues in the body.

TB remains one of the major health problems and the second leading infectious cause of mortality around the world [1], despite the availability of highly effective drugs and development of many strategies to fight the spread of the disease. In 2011 there were 9 million new cases and 1.4 million deaths with most of the cases occurring in Asia and Africa. Africa accounts for 24% of the cases and the highest rates of TB-HIV co-infections [1].

In Somalia, TB is one of the major public health crises. In 2011 the TB incidence in Somalia was estimated at 300 cases per 100,000 persons, but fewer than half of the estimated cases are actually detected [2]. MDR TB was detected in 5.2% of persons with newly diagnosed TB and 40.8% were re-treated patients. These levels appear to be highest in the south-central region [2].

There are no accurate figures for incidence and mortality rate in children, because most of the TB diseases in children are smear negative. According to WHO estimates in 2011, there were 0.5 million new cases and 64 000 deaths [1]. Children may account for up to 15% of total TB burden in Africa [3].

WHO announced in 1993 that TB is a public health emergency, but the focus was TB in the adult populations as adult TB is easily diagnosed, while TB in children was neglected, because it was difficult to make a diagnosis as the clinical and radiological features of childhood TB are often non-specific [4].

1.2 BACKGROUND AND LITERATURE REVIEW

1.2.1 Pathophysiology

Mycobacterium Tuberculosis is an infectious organism that spreads through air, when a person coughs or sneezes infective droplets into the air containing mycobacterium tubercle bacilli. A very small number of infective droplets are needed for tuberculosis infection to be inhaled.

After inhalation of these infective droplets, it deposits in the bronchioles and alveoli. This is followed by alveolar macrophage ingestion of the bacilli, but the macrophage is not sensitized to the organism and is incapable of killing it. The organism gets a chance to multiply inside the macrophage causing cell death. The infected macrophage secretes cytokines that attracts other phagocytotic cells like monocytes, macrophages and neutrophils leading to the formation of a granulomatous reaction called the tubercle. Subsequently the tubercle enlarges entering the adjacent lung parenchyma and lung lymph nodes forming Ghon complex. The organism continues to multiply until the stimulation of cell mediated immunity system develops that takes 2-6 week. If the body immune system fails to produce cell mediated immunity towards the proliferating bacilli, the bacilli starts destroying the lung parenchyma leading to formation of caseous necrosis. In this case the bacilli start spreading hematogenously to susceptible organs in the body such as CNS, bones, kidneys and abdomen.

The natural history of paediatric tuberculosis in children is divided into three stages: exposure, infection and disease [5]. The first stage is when the child has recent exposure to an adult with pulmonary disease, these children are free of clinical and radiological features suggestive of TB disease and Mantoux test are usually negative. The infection stage is when the cell mediated immune system developed, causing the Mantoux test to become positive but these children have no clinical symptoms and signs. The last stage is when the child starts developing symptoms and signs of TB disease (pulmonary or extra-pulmonary). TB disease is common during the infant and toddlers period and they are at a higher risk for extra-pulmonary TB specifically TB meningitis [6]. The interval between the infection and the disease can take several months to several years and radiographic abnormalities often are not accompanied by the symptoms [7].

About 80% of tuberculosis infection in the children affects the lungs, and the most common extrapulmonary tuberculosis infection is tuberculous lymphadenopathy (67%) followed by

meningitis 13%(occurs most commonly in infants and toddlers), pleural TB, miliary TB and skeletal TB [8].

1.2.2 Diagnosis of paediatric tuberculosis

The gold standard for diagnosis of TB is the bacteriological confirmation, which is rarely achieved in children [8]. Sputum smear microscopy is only positive for 5 to 10% in children with pulmonary TB, while microbial culture from gastric aspirate is confirms only 40% of children with tuberculosis disease [9].

The WHO recommends assessment of the clinical history and examination, in addition to the relevant investigation for diagnosing TB disease in children [10]. Close contact history has a critical role as those children exposed to adults with sputum smear positive have higher risk (60-80%) for TB infection [6].

The most useful clinical symptoms are persistent unremitting cough, failure to gain weight, fever or night sweats and fatigue. A study done in South Africa showed that the combination of these symptoms have higher rate of accuracy in HIV-uninfected children compared to HIV-infected children [4].

Mantoux tuberculin skin test (TST) is one of the investigations that are used for diagnosis of TB infection. Positive TST indicates that the child has been infected with TB, but does not necessarily indicate disease [11]. Therefore TST alone cannot be used as a confirmation of TB in children and must be combined with signs and symptoms of TB and other diagnostic tests [10]. A negative Mantoux test does not rule out TB [12]. The test should be regarded positive in the following setting [10, 13];

- >5 mm diameter of induration; in high-risk children (includes HIV-infected children and severely malnourished children, i.e. those with clinical evidence of marasmus or kwashiorkor).
- >10 mm diameter of induration; in all other children (whether they have received a Bacille-Calmette–Guérin (BCG) vaccination or not).

Most clinicians use chest x-ray for diagnosis of pulmonary TB, but the major problem for CXRs is the quality of the films which is poor in developing countries and gives findings not matching

with the clinical symptoms and signs [14]. CXRs alone cannot be used as a diagnosis of pulmonary TB in children, because of the low accuracy in children and the features of the CXRs may look like the other lung diseases [15]. The commonest radiographic findings are hilar lymph node enlargement, lung opacification, pleural or pericardial effusion and miliary mottling [12]. Cavitation is rare and tends to occur in older children [10].

Score charts are used widely in developing countries because of difficulties associated with the diagnosis of TB in children, but unfortunately they perform poorly in children suspected of having pulmonary TB and even worse in TB/HIV co-infected children [13]. These charts may be used as screening tools but not for making an accurate diagnosis of TB [13].

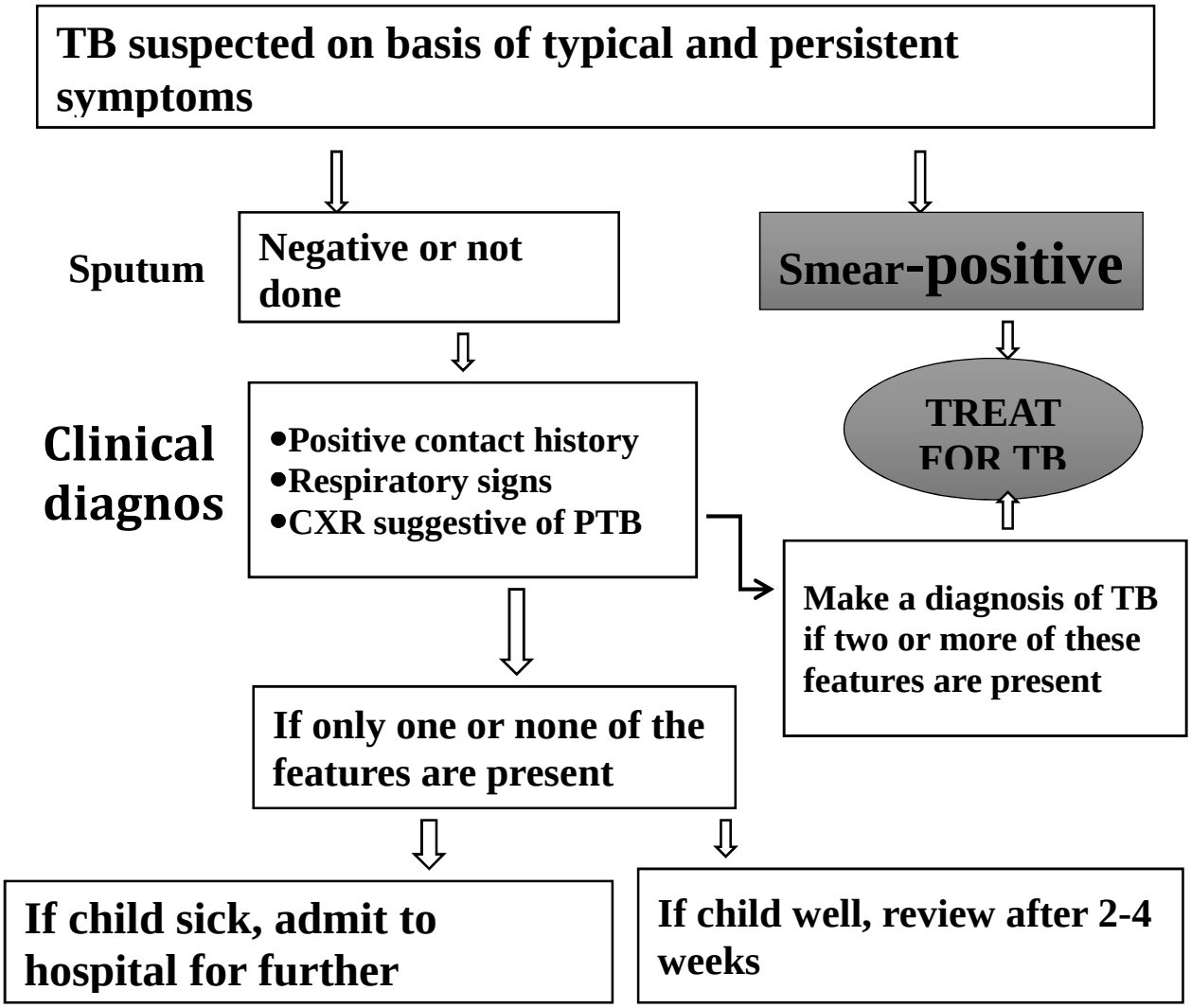
The diagnosis of TB in children has a lot of challenges and the majority of clinicians are not able to diagnose, that leads increased morbidity and mortality rate in children with TB disease, due to missed diagnosis or over-diagnosis. Box1 and Figure1; illustrates the approach that the health care worker can use to diagnose pulmonary tuberculosis disease in children; this approach is adopted by WHO and the International Union against Tuberculosis and Lung Disease.

Box 1; key features suggestive of pediatric TB [10]

The presence of three or more of the following should strongly suggest a diagnosis of TB:

- History of TB contact and chronic symptoms suggestive of TB (persistent non-remitting cough, failure to gain weight, fever or night sweats and fatigue)
- Physical signs highly of suggestive of TB (signs of pulmonary or extra-pulmonary TB)
- Positive tuberculin skin test
- Chest X-ray suggestive of TB (hilar lymph node enlargement, lung opacification, pleural or pericardial effusion, miliary mottling &Cavitation)

Figure 1: Approach to pulmonary TB diagnosis in children [12]



Notes : All children should be tested for HIV (HIV endemic areas).

CXR signs suggestive of TB are listed above

Interpretation of Mantoux test is mentioned above

1.2.3 Extrapulmonary TB:

The extrapulmonary tuberculosis disease in children is common and accounts for 25% to 35% of children with tuberculosis disease [7]. Table 1 illustrates the most common types of extrapulmonary tuberculosis in children and the investigations that can be used to reach the diagnosis

Table 1: Common forms of extrapulmonary TB in children [5]

Site	Practical approach to diagnosis
Peripheral lymph nodes (especially cervical)	Lymph node biopsy or fine needle aspiration
Miliary TB (e.g., disseminated)	CXR
TB meningitis	Lumbar puncture (and CT where available)
Pleural effusion (older children and adolescents)	Chest radiograph, pleural tap for chemistry, microscopy and culture
Abdominal TB (e.g., peritoneal)	Abdominal ultrasound and ascitic tap chemistry, microscopy and culture
Osteoarticular	Radiograph, joint tap or synovial Biopsy chemistry, microscopy and culture
Pericardial TB	Ultrasound and pericardial tap chemistry, microscopy and culture

1.2.4 TB/HIV co-infection

HIV infection affects a large population in Africa. HIV instigated immunosuppression predisposes adults and children to increased incidence of TB disease in Africa. A study conducted in South Africa showed that 48% of children confirmed to have TB diseases are also co-infected with HIV infection [16]. Thomas *et al* also found that HIV infected children are at a higher risk of TB then HIV uninfected children [17].

Mycobacterium tuberculosis is the most common opportunistic organism that affects HIV infected adults and children who are close to them have a high risk of infection with TB [17]. When HIV infected children are co-infected with mycobacterium tuberculosis, TB disease is likely to be under-diagnosed because the clinical and radiological features in the HIV infected are not specific [18]. HIV-TB co-infected in children have an increased risk of treatment failure and death. A study done in Ethiopia showed that those young children with TB who were HIV-infected had a 6-fold higher mortality than HIV-negative children [19]. Therefore comprehensive management approach is critical for those children who are infected by both diseases by giving

antituberculosis drugs and antiretroviral therapy [12]. Isoniazid preventive therapy should be given to all HIV infected children if there is no active TB disease [20]. HIV screening should be done in HIV epidemic areas [10].

1.2.5 Treatment of paediatric tuberculosis

The main objectives of anti-TB treatment are to [10]; cure the patient of TB (by rapidly eliminating most of the bacilli); prevent death from active TB or its late effects; prevent relapse of TB (by eliminating the dormant bacilli); prevent the development of drug resistance (by using a combination of drugs); decrease TB transmission to others.

Anti-TB treatments are divided into two phases [10]; an intensive phase and a continuation phase. The aim of the intensive phase is to rapidly eliminate the majority of organisms and to prevent the emergence of drug resistance. The purpose of the continuation phase is to eradicate the dormant organisms.

Traditionally, anti-tuberculous regimens have included bactericidal and bacteriostatic drugs that have required treatment for long periods, between 18 and 24 months, but more recently, multidrug regimens have been used with more rapid microbiological cure rates that allow shorter durations of therapy (short-course chemotherapy) [21].

For any child diagnosed with tuberculosis disease the anti-TB treatment must be prescribed according to the national treatment guideline. The treatment regimens should be given according to the clinical pattern that the child presented with. The child should get the right regimens and the correct dosage, so as to prevent treatment failure, drug resistance and death. Children respond well to TB treatment [10]. Table 2 and table 3 explain the different clinical pattern of paediatric tuberculosis and the appropriate regimens and dosages recommended by the WHO guidelines.

Follow up: Because TB treatment takes long time to be completed, the clinician should follow up the child at least 2 weeks after treatment initiation, at the end of the intensive phase and every 2 months until treatment completion [10]. The clinicians should assess the general condition of the child, treatment adherence and any adverse effect of the medication [13]. The weight of the child should be taken every visit and the anti-TB drugs should be adjusted according to the weight [10].

In children with sputum smear positive, repeat testing should be done at 2 month after initiation of the medication [13]. Follow-up CXRs are not routinely required in children, particularly as many children will have a slow radiological response to treatment [10].

Table 2: WHO recommended anti-TB treatment regimens for children with TB [22].

Disease	Situation	Anti-TB drug regimens	
		Intensive phase	Continuation phase
Extensive pulmonary	Any	2HRZE	4HR
Mild-to-moderate pulmonary	High HIV or high isoniazid resistance	2HRZE	4HR
Mild-to-moderate pulmonary	Low HIV or low isoniazid resistance	2HRZ	4HR
Lymphadenitis	High HIV or high isoniazid resistance	2HRZE	4HR
Lymphadenitis	Low HIV or low isoniazid resistance	2HRZ	4HR
Meningitis	Any	2HRZE	10HR
Osteoarticular	Any	2HRZE	10HR

H: isoniazid; R: rifampicin; Z: pyrazinamide; E: ethambutol; 2: two month; 4: four month.

Table 3: Paediatric dosage for anti-tuberculosis drugs as recommended by the WHO [21]

Drug	**Average dose in mg/kg**	**Range in mg/kg**	**Maximum dose**
Isoniazid	10	10-15	300
Rifampicin	15	10-20	600
Pyrazinamide	35	30-40	1.5g
Ethambutol	20	15-25	1.6g
Streptomycin	15	12-18	

1.2.6 Strategies for TB management

There are different strategies developed since the WHO declared that tuberculosis disease is a major public health problem. DOTS strategy was developed in 1994 for better management of TB. It has 5 components [23]; 1) sustained political commitment; 2) increased case detection through quality-assured bacteriology; 3) standardized treatment with supervision and patient support; 4) an effective drug supply; 5) monitoring and evaluation system.

DOTS strategy has been implemented in most countries of the word including high TB burden countries. It has helped the improvement of the National TB programs by increasing case detection and treatment success rates, and reducing incidence and morbidity rates among the population [23].

In 2006, the World Health Organization launched the Stop TB Strategy as evidence based approach for reducing the burden of TB in line with Millennium Development Goals (MDG) [23]. The targets of Stop TB strategy is to halt and reverse the incidence of TB by 2015 (MDG6, target6c), reduction of the prevalence and deaths due to TB by 50% by 2015, and elimination of TB as a public health problem by 2050 [23].

The Stop TB strategy provides special consideration to the children with tuberculosis disease by recommending the following interventions [24];

- Mobilizing commitment at global and national levels to address childhood TB.
- Promoting strategic partnerships and synergies across the health system, especially between TB, maternal and child health and immunization programmes and relevant stakeholders, to prioritize and facilitate early detection and management of children with TB.
- Advocating for increased research and development of new diagnostics, drugs and vaccines for childhood TB.
- Implementing contact investigation and providing isoniazid prevention therapy to children less than 5 years.
- Advocating for family-based approaches to be integrated into TB and HIV activities.

1.2.7 The role of private practitioners in TB management

Private health sectors have a great role in managing the issues related to the health in the community because they are located close to the community and in many instances they are better equipped than public health facilities. In the nine poorest countries of the world, 47% of patients seeking care in the private health providers are the poorest people in the population [25]. In developing countries with a high burden of TB diseases, most patients with suggestive TB disease first visit the private health providers that are often not linked to public sector-based NTP [26]. A study done by Marsh *et al*, revealed that more than 80% of TB patients in Pakistan first seek care from private practitioners [27], while another survey done in India found that for more than 86% of TB patients, the first source for help was a private health providers [28].

Although a large number of TB patients have been managed in the private health sector, the knowledge and practice of tuberculosis management in this sector is poor according to the National or International standard. The majority of the private practitioners frequently use CXRs for diagnosis of TB instead of sputum examination. A survey done in India showed that about 89.5% of the Private practitioners (PPs) in the study recommended CXR for diagnosis of TB [29]. For treatment of TB most PPs prescribe different regimens that are not included in the National treatment guidelines. A survey done in India revealed that 187 PPs in the study used 102 different regimens, but only 29.4% of the PPs use the regimen recommended by the Revised National TB Control Program [29]. Another study done in Eldoret, Kenya, showed that about 10% of PPs in the study were familiar with the recommended regimens by the NLTP and the rest prescribed un-recommended treatment regimens [30]. The same figure was found in a study done in North-Western Somalia showed that only 4 doctors out of 53 doctors in the survey prescribed the recommended regimens by the NTP [31].

Most private practitioners are not familiar with the diagnosis of TB in children. Ayayo et al showed that few doctors knew that the clinical features that can be considered as suspicious of TB in children are failure to thrive (FTT) (20.6%), close contact with adult TB (12.8%), and cough for more than two or more weeks (7.8%) [30].

1.2.8 Public private mix strategy

Public private mix (PPM) implies the engagement of diverse care providers in TB care into the National Tuberculosis Programs (NTPs). It's one of the essential components of the WHO's Stop TB Strategy [26]. This strategy was developed between 1999 and 2000 as the response to the poor management of TB in the private health sector.

Evidence suggests that failure to involve all care providers used by TB suspects and patients hampers case detection, delays diagnosis, leads to inappropriate and incomplete treatment, contributes to increasing drug resistance and places an unnecessary financial burden on patients [26].

The aim of PPM is to increase case detection and treatment success rate of patients with TB and enhancing patient support by reducing the cost care [26].

The intervention package that was used to improve the quality of standards for TB control in the private sectors was [32,33,34]:

- Training private health providers for diagnosing and treatment of tuberculosis patients according to the national TB guidelines.
- Motivating PPs to refer patients to the NTP laboratories for diagnosis.
- Improving referral and information systems through simple tools.
- Requesting private laboratories to report results of sputum examination.
- Setting DOTS centers in the private health services.
- Providing free drugs and NTP guidelines to the health sectors.
- Sensitizing staff of the NTP to the importance of private health providers.
- Continues supervising and monitoring of the private sectors by the NTP.

Most of the countries of the world have adopted this strategy in their national TB programs and have shown a good outcome. In India the case detection rate was increased from 50 to 200/100,000 over the first 2-3 years of implementing the project and 90%of the new smear positive were successfully treated [35]. The number of private practitioners using CXRs alone for diagnosis of TB was reduced to 16% from a baseline of 45.4% [36]. In Africa, a study done in Kenya showed that TB cases reported by private providers increased from 469 in 2002 to 1740 in 2006, while treatment successful rate increased from 76% to 85% between 2002 and 2005 [37].

The department of health in Somalia has adopted this strategy in the NTP. Up to 2012 only 10% of the medical private practitioners were trained for the implementation of NTP in their private clinics [38].

CHAPTER 2

STUDY JUSTIFICATION & STUDY OBJECTIVES

2.1 STUDY JUSTIFICATION

Large populations of patients including TB patients in developing countries seek medical care in the private health sector [27, 28] that is often not linked to the public health sector. Several studies done in different countries of the world have shown that the knowledge and practice of private practitioners regarding TB management is not optimal and most of the private practitioners are not familiar with the National treatment programs [30,39,40,41,42,43]. Therefore many patients are at risk of missing the benefits of the DOTS strategy. The increasing number of patients with MDR-TB is linked to the poor prescribing practice of TB treatment [2,41]. Therefore engagement of private practitioners in to the DOTS strategy is an essential component of the Stop TB strategy [39].

Somalia has been at civil war for the last 2 decades and the health infrastructure has been destroyed. The public health care system in Mogadishu has collapsed, but few public hospitals are still functioning and are run by international non-governmental organizations.

In general about 20% of the Somali population gets any health care in Somalia, with 70% of them seeking care from the private health sector [44]. The majority of them are women and children including children suffering from TB [45]. However the knowledge and practice of private medical practitioners regarding the management of TB may not be optimal. A study done in North-Western Somalia showed that few doctors follow the National treatment guidelines for the control of TB [31]. The prevalence of MDR-TB in Somalia is estimated at 5.2% of persons with newly diagnosed TB and 40.8% of re-treated patients and is the highest in the region [2].

Paediatric TB is one of the major public health problems that increase morbidity and mortality rates among children. It can only prevented by early diagnosis and treatment. However no study has been done to determine the role of the private medical practitioner in Mogadishu in paediatric TB management.

This study assessed the knowledge of the private medical practitioners on paediatric TB management, the tools that they use to reach diagnosis and their adherence to the international diagnostic and treatment guidelines.

The study will improve the management of paediatric tuberculosis by raising the awareness of private practitioners on the importance of using national treatment guidelines in managing children with TB diseases.

2.2 STUDY OBJECTIVES

2.2.1 Main objective

To assess the knowledge and practice of private practitioners regarding diagnosis and treatment of paediatric tuberculosis in Mogadishu.

2.2.2 Specific objectives

1. To assess the knowledge of private practitioners on the diagnosis and treatment of paediatric TB.

2. To determine the level of adherence to the National and international guidelines among private practitioners.

CHAPTER 3

STUDY METHODOLOGY

3.1 Study design

The study was a cross sectional survey.

3.2 Study area

The study was carried out in Mogadishu the capital and the largest city in Somalia. In 2011, the population was estimated at about 2.5 million and about 200,000 of them were IDPs [46]. The public health care system in Mogadishu has collapsed because of the fighting that was in Mogadishu for two decades. A small number of public health care facilities have been re-established by international non-governmental organizations, to give free health care to patients in the city especially to the internally displaced people (IDPs). Therefore, the majority of the community seeks medical care from the private health sector.

3.3 Study period

The study was carried out in period December 2013 to January 2014

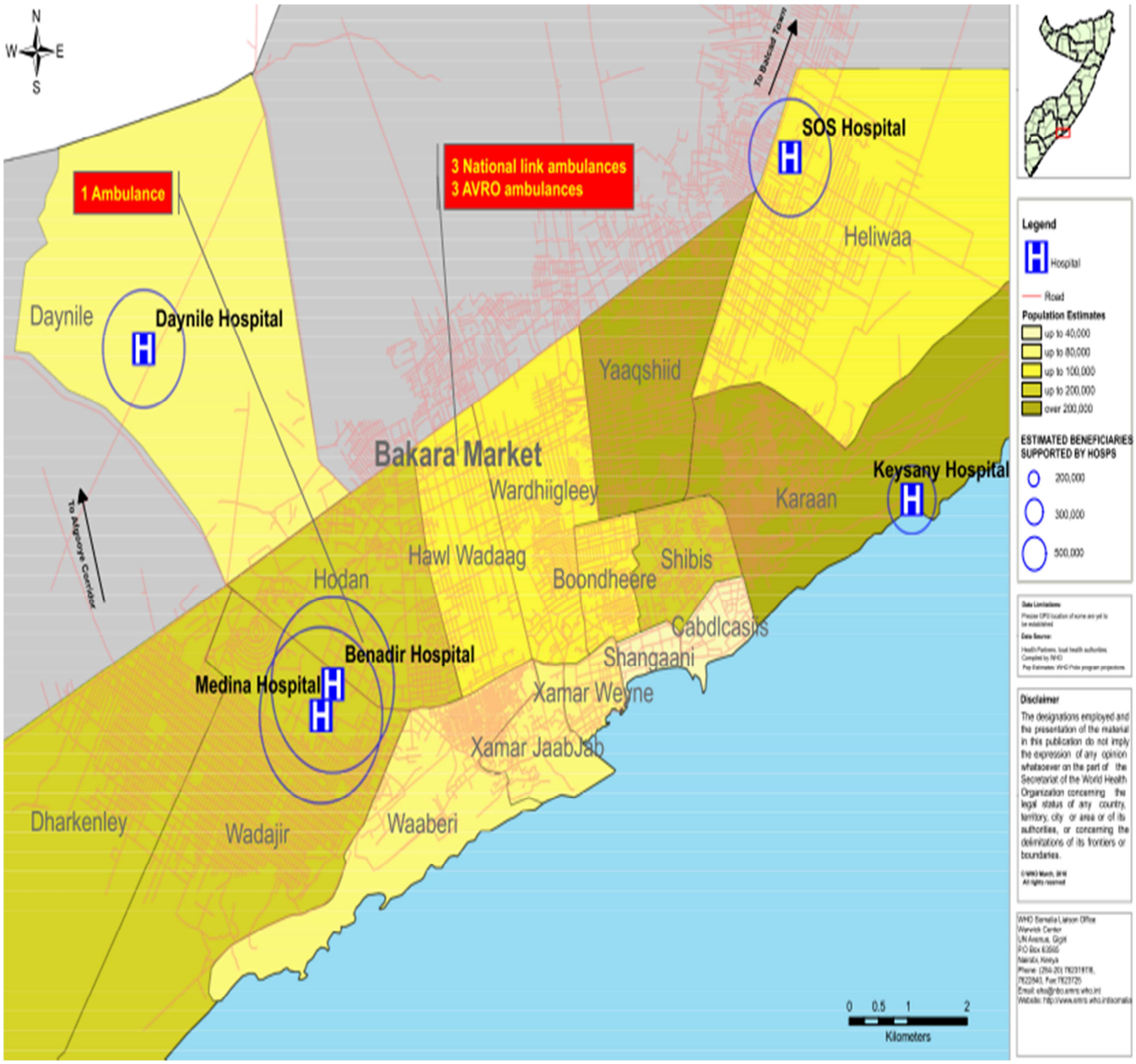
3.4 Study population

The study populations were medical private practitioners who were running outpatient clinics in Mogadishu. The private practitioners were general medical doctors and clinical officers. The health sector under the Somali ministry of public affairs doesn't have the exact data of private practitioners in Mogadishu.

Politically Somalia is divided in to 3 zones; Somaliland, Puntland, and South Central Somalia. In 2007, UNDP estimated that 253 physicians work in Somalia, but only 94 of them worked in South Central Somalia including Mogadishu [47]. In South Central Somalia most of the health professionals are clustered in Mogadishu [48].

Figure 2: Map of political zones in Somalia.

Figure 3: Map of Mogadishu and its population density



3.4.1 Inclusion criteria

All medical private practitioners who were running general outpatient clinics, and signed the consent form.

3.4.2 Exclusion criteria

All medical practitioners in the public health care system.

Private practitioners who were not managing paediatric patients.

Private practitioners who declined to sign the consent form.

3.5 Sample size

The sample size was calculated using this formula:

$$n' = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$

n' = sample size with finite population correction

N = population size. Since no one knows the exact number of private practitioners, the researcher used the data released from UNDP in 2007 for the physicians work in south central Somalia as a maximum number of physicians in Mogadishu, which was 94 physicians.

Z² = 95% of confidence level and equals 1.96

P = Expected prevalence of acceptability of questionnaires among private practitioners which equals 50%

d² = Is the level of precision or sampling error and equals 10% (0.10)

Thus the total sample size was 48 private practitioners

Since the number of general private practitioners working in Mogadishu is not known, a consecutive sampling was done to include all general private practitioners who met the criteria mentioned above until the sample size was attained. Mogadishu has 16 districts. The data were collected from 14 out of the 16 districts in Mogadishu, as these districts were safe. Approximately 90% of districts in Mogadishu were considered to be safe during the period of

data collection. Those districts were Dharkenley, Wadajir, Hodan, HawlWadaag, Yaagshiid, Karaan, Shibis, Shangani, Xamar Jaajab, Xamar Weyne, Cabdicasiis, Waabari, Hawl Wadaag, Boondheere, and Wardhiigley. The researcher started the data collection from highly populated districts in Mogadishu assuming that these areas have a higher number of private health sectors using a map released from WHO in 2010 (figure 3). The researcher did not collect data from those districts that were currently having security problems like Daynile and Heliwaa.

3.6 Sample collection method

Pre-tested questionnaires were used to collect the information from medical private practitioners. The questionnaire was pretested on 5 general private practitioners who met the inclusion criteria and these clinicians were excluded from the study. The aim of the pretesting was to evaluate the feasibility of the questionnaires and to identify any problems.

The researcher identified 51 private practitioners during the data collection period during which 39 clinicians completed the questionnaire. The researcher visited the clinicians in their clinics and requested their participation in the study. On signing the consent form, they were given the study instruments. The tool collected data on the clinician's qualifications (medical doctor or clinical officer), years of practice and whether they had managed a child with TB in the 2 years preceding the study. The study instrument also collected data on clinical symptoms and signs used for diagnosis, the co-morbidities commonly associated with TB in children, investigations and the knowledge regarding the recommended treatment of paediatric TB. The questionnaire also collected data related to whether the clinicians had attended any TB-related training 2 years prior to the study and the availability of National or WHO guidelines. Challenges around service delivery were documented such as availability of drugs, referral services and follow up of cases. Completeness of all data collected was checked before leaving the clinic.

The researcher also collected 48 prescriptions written by different clinicians from different pharmacies in Mogadishu and analyzed them to assess the practice of clinicians in the treatment of paediatric TB and adherence to the national or WHO guideline. The researcher recruited two pharmacists. These pharmacists were trained by him to filling the data collection form found in appendix 3. Only the generic names of the drugs were entered into the data collection form. The form indicated the age and weight of child, the dose of the anti-TB drug, and the type of regimen

that the child had had prescribed for him. Prescriptions that did not have age or weight were excluded from the study. The name of the clinician and the child was not written on the form.

3.7 Data management and analysis

The data was coded and entered into Excel spreadsheets and then imported to SPSS version 17 for analysis. Descriptive statistics including Mean, Median, Standard Deviation and Frequency Distribution were used. Frequency in this study is reported in terms of numbers and percentages and will appear in the form of tables and graphs.

The private medical clinicians were categorized as medical doctors or clinical officers. Comparison between the two groups with regard to their knowledge of symptoms and recommended treatment of TB was made using Chi-square. The same was repeated for a comparison of those who had access to national or WHO guidelines.

3.8 Dissemination of the study findings

The research finding will be disseminated to the study participants through a symposium that the researcher will hold within 2 years of the completion of the dissertation in Mogadishu.

The research findings will also reach the study participants through a “letter of thanks” that the researcher will write after his completion of the postgraduate program in the University of Nairobi.

The research findings will be shared with the health policy makers through personal visits to their offices.

Somali medical websites with interesting health related stories will be used to disseminate the results of the study, so that the target population “private practitioners in Somalia” can get access to that information, which will help the improvement of the management of children with TB.

The researcher will also share the research findings with the Department of Paediatrics and Child health of the University of Nairobi as a requirement of completion of the postgraduate program.

A hard copy of the whole thesis will be placed in the library of the College of health science of the University of Nairobi to be used as a reference by researchers doing the same topic in the future. The research findings will also be published in a medical journal.

3.9 Ethical consideration

An ethical clearance certificate was obtained from the Kenyatta National Hospital/University of Nairobi ethical committee and the Ministry of Public Affairs in Somali, Department of Health.

A consent form was signed from the general private practitioners who met the inclusion criteria. Anonymity was ensured throughout the study as participants were requested not to write their names on the questionnaire. Their names in the consent form were not used in the study. All the personal identifiers were handled with a high level of confidentiality and only people who were closely concerned with the research were allowed to view this information. All personal information was destroyed after the completion of the study.

The results of the study will be availed to the Department of Health in Somalia and the UON with appropriate recommendations for consideration.

3.10 Limitations of the study

There is limited related literature regarding private practitioners in Somalia. The researcher was forced to use literature from other countries and a limited source from North-Western Somalia.

There is limited data related to private medical practitioners registered by the department of health in Somalia. The researcher was forced to collect the data from different districts of Mogadishu, asking assistance from medical practitioners, pharmacists and other health workers to find out private medical practitioners that were running private hospitals or clinics in their district.

The researcher did not collect data from two districts in Mogadishu, because of insecurity.

CHAPTER 4

RESULTS

4.1 Description of the study population.

The data was collected from 13 districts out of the 16 districts in Mogadishu as shown in figure 5. About 60% of the data was collected from clinicians practicing in the following districts; Hodan (28.21%), Wadajir (12.82%), Wabari (10.26%) and Dharkinley (7.69%).

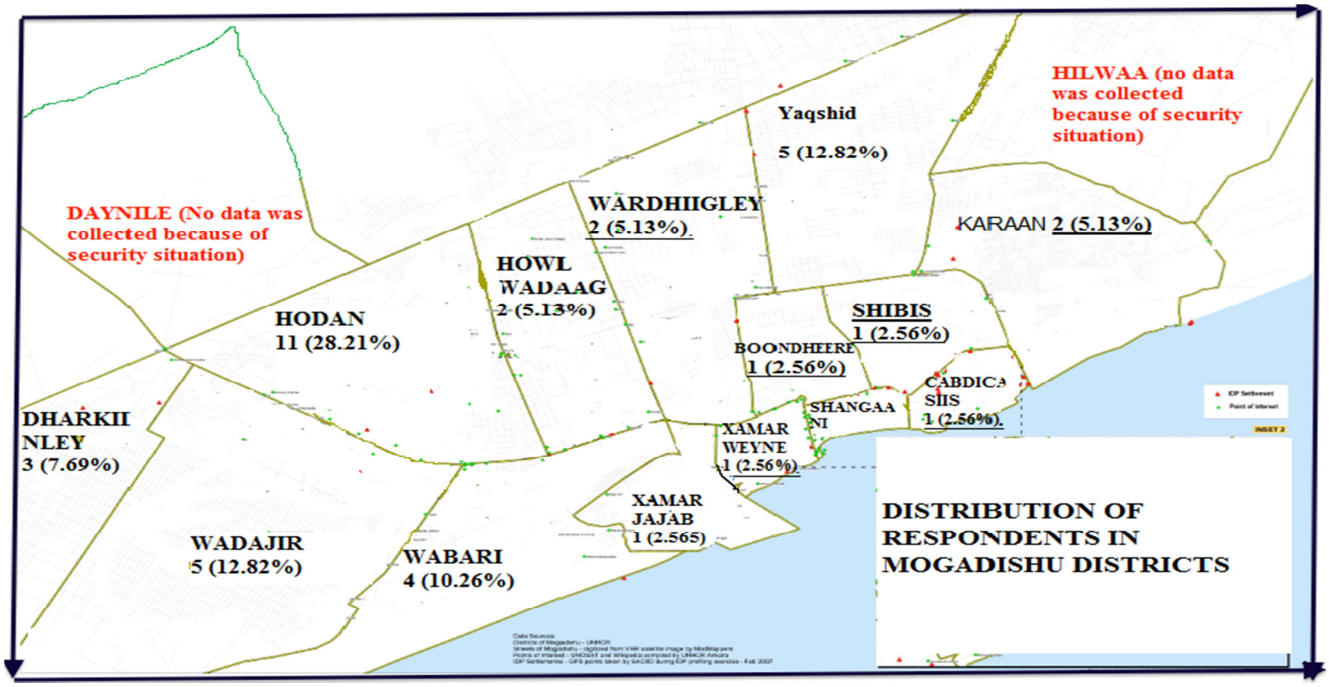


Figure 4: Distribution of the respondents in Mogadishu districts

Table 4: Characteristics of the study participants.

Characteristics	Total (%)
Title	
Medical doctor	31 (79.5%)
Clinical officer	8 (20.5%)
Years of practice	
>2 years	8 (20.5%)
2 - 5years	8 (20.5%)
5 - 10 years	12 (30.8%)
>10 years	11 (28.2%)
Managed child with TB for the last 2 years	
Yes	36 (92.3%)
No	3 (7.7%)

The researcher identified 51 clinicians who were eligible to include this study, but the respondents were 39. The main reasons for non-participation were: being too busy (5), participated in the pretest (5) and missed appointment (1). Out of 39 practitioners, there were 31(79.5%) medical doctors and 8(20.5%) clinical officers as shown in table 4. More than half 23 (59.0%) of the respondents had practiced medicine for 5 years or more. Only 8 (20.5%) had practiced for less than 2 years. About 92% of the clinicians enrolled in the study had managed pediatric TB in children in the 2 years preceding the study.

Table 5: The respondents, that attended any TB training for the last 2 years or had a copy of Somali national or international TB guidelines or other materials.

Characteristics	**Total (%)** **N= 39**
Attended any TB training in the last 2 years	9 (23.1%)
Has a copy of National or international TB guidelines	13 (33.3%)
Type of guideline, No.=13	
National Somali guideline	4 (30.8%)
WHO guideline	7 (53.8%)
MSF guideline	2 (15.4%)
Has a medical textbook	21 (53.8%)

Table 5 shows that only 9 (23.1%) of the 39 clinicians had received TB-related training in the two years period preceding the data collection. Only one third 13 (33.3%) of the clinicians had a copy of National or International guidelines in their clinic. Out of 13 guideline documents, 7 (53.8%) were WHO guidelines, 4 (30.8%) were National Somali TB guideline, and the remaining 2 (15.3%) were MSF guideline. A further 15 (38.5%) used textbooks or other materials in lieu of the National or International guidelines, while the rest 10 (25.6) did not have textbooks or other materials that helped them for management of TB in children.

4.2 Experiences of private medical practitioners regarding diagnosis of paediatric TB.

Table 6: Knowledge regarding symptoms and signs that the practitioners used to reach a diagnosis of TB in children

Symptoms	Total (%)	Signs	Total (%)
Loss of weight	36 (92.3%)	Chest signs	6 (15.4%)
Cough > 2 week	35 (89.7%)	Lymphadenopathy	2 (5.1%)
Fever > 2 week	34 (87.2%)	Anemia	2 (5.1%)
Night sweating	25 (64.1%)		
Loss of appetite	10 (25.6%)		
Fatigue	6 (15.4%)		
Hist. of trauma	6 (15.4%)		
Hist. of TB contact	5 (12.8%)		
Vomiting	1 (2.6%)		

Overall, most of the practitioners expressed that fever for more than 2 week (87.2%), cough or more than 2 weeks (89.7%), loss of weight (92.3%) and night sweating (64.1%) led them to suspect TB disease in children. Only 5 (12.8%) of the respondents used history of TB contact to make a diagnosis of paediatric TB. Six (15.4%) of the practitioners were aware that fatigue is one of symptoms of TB in children, while 6 (15.4%) used history of trauma to diagnose TB in children. For the knowledge regarding signs, 6 (15.4%) of the clinicians mentioned chest signs, while 5.1% sited lymphadenopathy and anemia.

More than half (56.4%) of the clinicians sited HIV/AIDS to be associated with TB in children, while 11(28.2%) of the respondents mentioned malnutrition and 5 (12.8%) stated anemia as the disease most commonly associated with TB in children (figure 6).

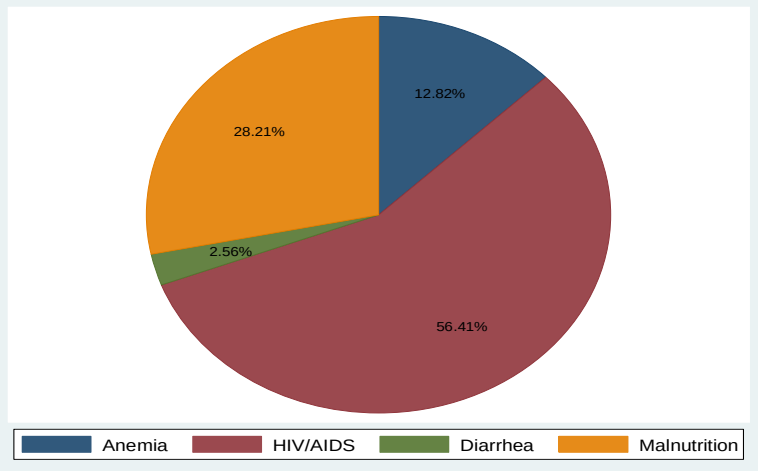


Figure 5: Knowledge regarding the diseases that commonly associated with TB in children

Figure 7 shows the investigations carried out by the clinicians. More than half of the practitioners 21(53.85%) relied on CXR and ESR for the diagnosis of tuberculosis in children, while 16 (41.03%) relied only CXR for TB investigation. Only 1 (2.56%) relied on sputum for TB investigation in children. None of the clinicians considered Mantoux test as a tool for investigation of TB in children.

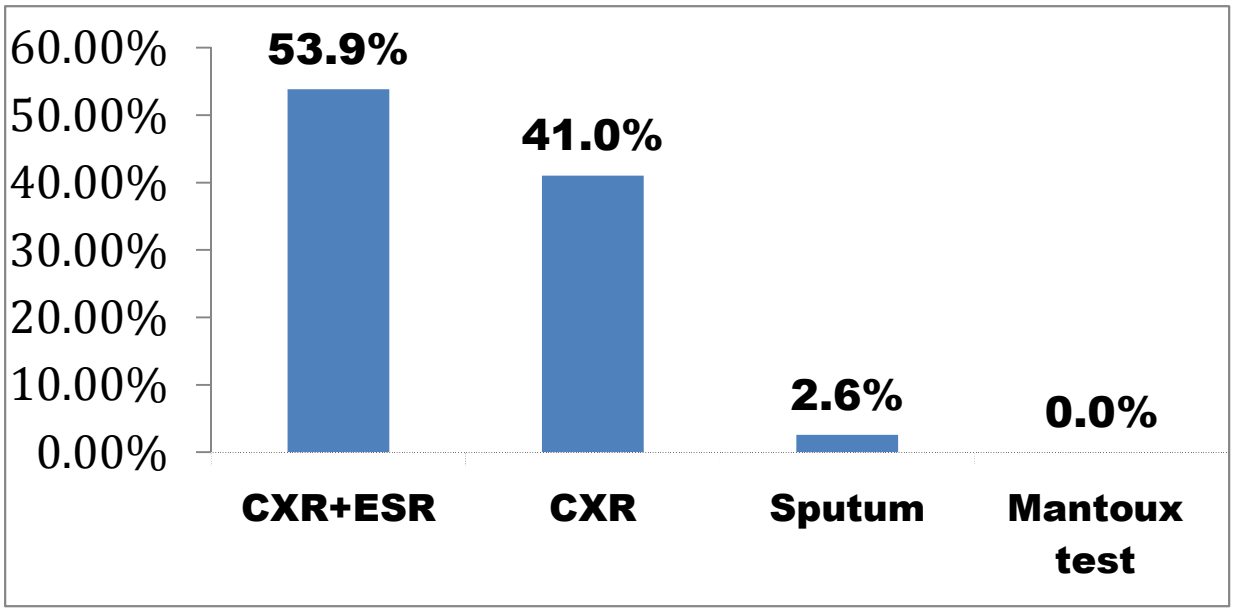


Figure 6: Tools for diagnosing TB in children

4.3 Experiences of private medical practitioners regarding treatment of paediatric TB.

Table 7: Knowledge of private medical practitioners regarding the recommended treatment regimen of paediatric tuberculosis.

Disease	Regimen	Total (%)	Correct response
Pulmonary TB	Induction phase		
	RHE	1 (2.6%)	
	RHZ	29 (74.4%)	RHZ = 29 (74.4%)
	RHZE	8 (20.5%)	
	Continuation phase		
	Don't know	1 (2.6%)	RH = 38 (97.4%)
	RH	38 (97.4%)	
TB Meningitis	Induction phase		
	Don't know	7 (17.9%)	
	RHE	3 (7.7%)	
	RHS	1 (2.6%)	RHZE = 11 (28.2%)
	RHS + Steroids	1 (2.6%)	
	RHZ	7 (17.9%)	
	RHZE	11 (28.2%)	
	RHZE + Ceftriaxone	1 (2.6%)	
	RHZE + Steroids	2 (5.1%)	
	RHZES	4 (10.3%)	
	RHZS	1 (2.6%)	
	RHZS + Steroids	1 (2.6%)	
	Continuation phase		
	Don't know	7 (17.9%)	RH = 32 (82.1%)
	RH	32 (82.1%)	
Miliary TB	Induction phase		
	Don't know	16 (41.0%)	
	RHE	2 (5.1%)	RHZE = 15 (38.5%)
	RHS	1 (2.6%)	
	RHZ	3 (7.7%)	
	RHZE	15 (38.5%)	
	RHZE + Steroids	1 (2.6%)	
	RHZS + Steroids	1 (2.6%)	
	Continuation phase		
	Don't know	16 (41.0%)	RH = 23 (59.0%)
	RH	23 (59.0%)	
TB/HIV co-infection	Induction phase		
	Don't know	28 (71.8%)	RHZE = 9 (23.1%)
	RHES	1 (2.6%)	
	RHZE	9 (23.1%)	
	RZ	1 (2.6%)	
	Continuation phase		
	Don't know	31 (79.5%)	RH = 8 (20.5%)
	RH	8 (20.5%)	

R= Rifampicin, H= Isoniazid, Z= Pyrazinamide, E= Ethambutol, S= Streptomycine

Table 7 shows that more than two thirds 29 (74.4%) of the clinicians recommended RHZ for treatment of pulmonary TB in the induction phase. For a case of TB meningitis, practitioner's recommends different regimens but the most common regimens recommended were RHZE 11(28.2%), RHZ 7(17.9%), RHZES 4(10.3%) and RHE 3(7.7%). Four (10.2%) of the respondents mentioned that they recommend steroid drugs to be added anti-TB drugs for the treatment of TB meningitis during the induction phase. For a case of miliary TB, 16 (41.0%) of the respondents did not know the recommended regimen, while the remaining recommended different regimens; RHZE (38.5%), RHZ (7.7%), RHE (5.1%) and 1 (2.6%). Majority of the clinicians 28 (71.8%) did not know the recommended regimen for treatment of TB co-infected with HIV infection.

Table 8: Comparison of correct and incorrect regimen recommended by the private medical practitioners based on national and international TB guideline.

Regimen	WHO or Somali national guideline		
	Recommended	Not recommended	Not known
Pulmonary TB			
Induction	29 (74.4%)	9 (23.0%)	1 (2.6%)
Continuation	38 (97.4%)	0	1 (2.6%)
TB meningitis			
Induction	11 (28.5%)	21 (53.9%)	7 (17.9%)
Continuation	32 (82.0%)	7 (17.9%)	0
Milliary			
Induction	15 (38.5%)	10 (25.6%)	14 (35.9%)
Continuation	23 (59.0%)	0	16 (41.0%)
TB/HIV co-infection			
Induction	9 (23.1%)	2 (5.1%)	28 (71.8%)
Continuation	8 (20.5%)	0	31 (79.5%)

With regard of pulmonary TB, out of 39 doctors, 29(74.4%) stated the correct regimen for the induction phase and 38 (97.4%) of the practitioners knew the correct regimen for the continuation phase. In the case of TB meningitis more than half did not know the recommended regimen for the induction phase, while more than two thirds stated the recommended regimen for the induction phase. For miliary TB, one third (35.9%) of the respondents did not know the recommended regimen, while 25% of the practitioners said the incorrect regimen. For TB in the context of HIV, two third (79.5%) of the practitioners did not know the recommended regimen.

Table 9: Comparison between clinicians who had copy of national or WHO guidelines and clinicians did not have a copy.

Characteristics	**Copy of national or WHO guideline**		**P-value**
	Yes (N=13)	**No (N=26)**	
Attended TB training	7 (53.8%)	2 (7.69%)	0.001
Correct Symptoms (National & WHO)			
TB contact + 3 correct symptoms (n=5)	1 (7.69%)	4 (15.38%)	0.135
Only 3 correct symptoms (n=31)	12 (92.31)	19 (73.07%)	
Knows recommended Treatment of pulmonary TB	10 (76.92%)	19 (73.08%)	0.795
Knows recommended Treatment of TB meningitis	10 (76.92%)	8 (30.77%)	0.615
Knows recommended treatment of Miliary TB	8 (61.54%)	7 (26.92%)	0.036
Knows recommended Treatment of TB in context of HIV	5 (38.46%)	4 (15.38%)	0.107

Table 10 compares clinicians who had a copy of Somali National or WHO guideline and those did not have. More than half (53.8%) of clinicians who had a copy of the National or WHO guideline attended TB-related training for the last 2 years, while 92.3% of clinicians did not have a copy of national or WHO guideline, not attended any TB-related training (p-value 0.001). There was no significance difference among clinicians who had a copy of national or WHO guideline regarding symptoms that they use to suspect TB in children. for treatment of extra-pulmonary TB and TB in context of HIV, clinicians who had national or WHO guideline are recommending correct regimen comparing to clinicians who did not have.

4.3 Service delivery

Table 10: Challenges of service delivery

Service delivery	Total (%)
Challenges in accessing drugs	
Yes	9 (23.1%)
No	30 (76.9%)
Does lack of drugs affect prescription practice	
Most times	2 (5.1%)
Some times	6 (15.4%)
None	31 (79.5%)
Awareness of where TB patients can get free drugs	
Yes	35 (89.7%)
No	4 (10.3%)
Referring TB patient to any other health center	
Yes	13 (33.3%)
No	26 (66.7%)

Table 11 shows that the majority of the practitioners 30 (76.9%) did not have challenges for accessing anti-TB drug. About 90% of the respondents were aware where TB patients could get free anti-TB drugs. Only one third (33.3%) referred TB patients, while two thirds treated in their facilities.

More than two thirds (76.9%) of clinicians mentioned that they follow up their patients with TB at monthly intervals, while 18% said that they followed up every alternative month as figure 8 shows.

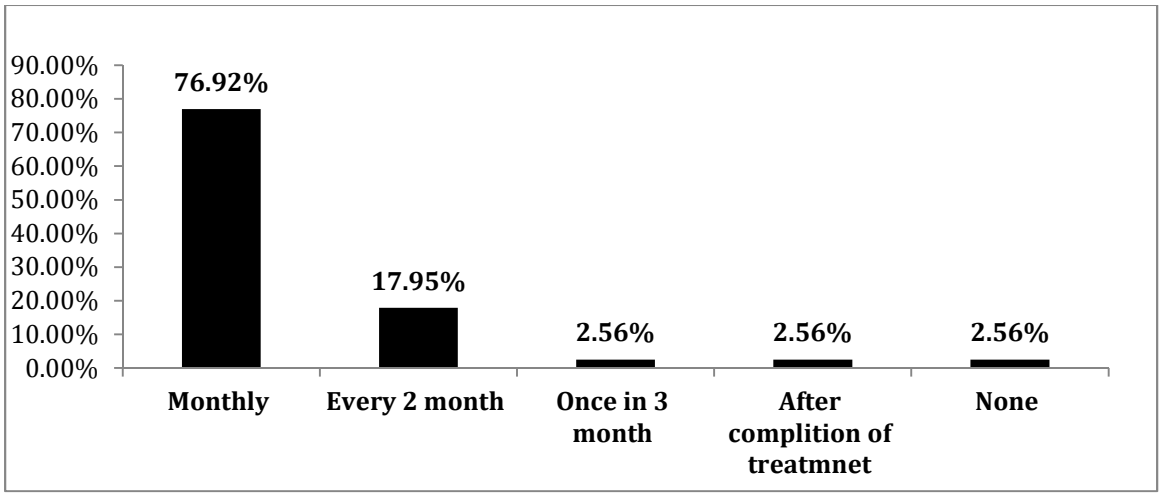


Figure 7: Frequency of follow up of the cases by respondents

4.4 Prescription written by the private medical practitioners collected from pharmacies in Mogadishu

Table 11: List of the regimen in the prescription

Regimen	Total (%)
R 120, H 100, Z 300	7 (14.6%)
R 120, H 100, Z 300 + E 275	1 (2.1%)
R 120, H 50, E 300	9 (18.7%)
R 120, H 50, Z 300 + E 275	2 (4.2%)
R 150, H 100	9 (18.7%)
R 150, H 75	7 (14.6%)
R 150, H 75, Z 400, E 275	3 (6.2%)
R 300, H 150	3 (6.2%)
R 60, H 30, Z 150	6 (12.5%)
R 60, H 30, Z 150 + E 275	1 (2.1%)

R= Rifampicin, H= Isoniazid, Z= Pyrazinamide, E= Ethambutol

The 48 different prescriptions collected from pharmacies in Mogadishu, showed that private medical practitioners used different fixed dose combination (FDC) for a treatment of TB in children. Only 18 (39 %) of the prescriptions used the recommended FDC approved by the WHO, while the remaining 61% were using FDCs that were not recommended by the WHO. The prescriptions did not clarifying whether the patient was in intensive phase or continuation phase.

Table 12: Individual dosage calculation based on the weight of the child according to Somali National or WHO guidelines

Drug	Dosage calculation as per Somali and WHO guidelines		P-value
	Appropriate	Inappropriate	
Rifampicin	21 (43.75%)	27 (56.25%)	0.3902
Isoniazid	2 (4.17%)	46 (95.83%)	<0.001
Pyrazinamide	3 (6.25%)	25 (93.75%)	<0.001
Ethambutol	4 (57.14%)	3 (42.86%)	0.708

The table 12 shows that of the three drugs that are commonly prescribed for the TB patients (rifampicin, isoniazid and pyrazinamide), rifampicin was the best in terms of dosing as per Somali national and WHO guidelines, followed by pyrazinamide and isoniazid with the correct dosage recorded in 3 (10.34%) and 2 (4.17%) patients respectively. On individual dosage calculation, isoniazid was incorrectly prescribed in 95% of the patients followed by pyrazinamide 86 %. Of the 48 prescriptions collected, only one prescription (2.08%) was correctly prescribed according to the weight of the child.

CHAPTER 5

DISCUSSION

This study reveals that the knowledge and practice of private practitioners regarding the diagnosis and treatment of paediatric tuberculosis in Mogadishu is not satisfactory. Although the majority of the clinicians used cough for more than 2 weeks, fever for more than 2 weeks and weight loss for a diagnosis of TB in children, few clinicians 5(12.82%) stated history of TB contact while about 15% of the clinicians mentioned features not suggestive of paediatric TB like history of trauma. Similar results were found in a study done in Eldoret, Kenya, where few clinicians (12.8%) were aware of the history of TB contact as one of the important clinical features for diagnosis of TB in children [30]. The majority of the clinicians did not mention the recommended treatment of paediatric TB and only one had correctly prescribed the correct dosage according to the weight of the child. The reason for this poor knowledge performance may be because about 77% of the clinicians had not received any TB-related training in the 2 years prior to the study and only one third of the clinicians had a copy of the National or WHO guideline in their clinic.

Most of the clinicians 53.8% used CXR and ESR for diagnosis of TB in children, while 41.3% relied on CXR alone for investigation of TB in children. CXRs alone cannot be used for the diagnosis of pulmonary TB in children because of the low accuracy in children and also because the features of the CXRs may look like the other lung diseases [15], while ESR is not a recommended test for the diagnosis of TB in children according to the National or International guidelines [10,49]. None of the clinicians recommended TST for diagnosis of TB in children. TST is often not available in low resource setting areas and that may be the reason why clinicians did not consider it as a tool for investigation of TB in children [51]. Globally, the majority of private practitioners rely on CXR for diagnosis of TB. A study done in India and the Philippines found that 89.5% and 87.9% respectively of the participants recommended CXR for diagnosis of TB [28,51].

The researcher found that the clinicians were familiar with the recommended treatment of pulmonary TB when compared to extrapulmonary TB and TB/HIV co-infection. This may be due to the high burden of pulmonary TB, complexity in the diagnosis of extrapulmonary TB and

the low endemicity of HIV in Somalia. Clinicians who had a copy of the National or WHO guideline were more likely to recommend appropriate regimen (53.8%) compared to those who did not have guidelines (92.3%). Different studies done in different countries have found that clinicians in the private sector are not familiar with the recommended treatment of TB. A cross-sectional study done in North-Western Somalia by Suleiman *et al*, revealed that only 4 (7.5%) of the 53 clinicians recruited into the study recommended the correct regimen according to National TB guideline [30]. Another study done by Ayaya *et al*, in Eldoret, Kenya, revealed that there were 16 regimens mentioned and used for the treatment of TB. Only 23.9% of the regimens were recommended by the NLTP and the rest were inappropriate regimens [30]. An institution based cross-sectional study conducted in Ethiopia by Yimer *et al* in 2012, revealed that 37 (33.0%) of the private practitioners enrolled in the study were able to accurately list the appropriate regimens for treatment of all categories of TB as recommended in the National Tuberculosis and Leprosy Control Program guidelines. A survey done by Single *et al* in India, to investigate the knowledge, attitude and practice of private practitioners for tuberculosis in Delhi, found that only 29.4% regimens were correctly prescribed according to RNTP [29]. Portero *et al* also found that the majority (89%) of the private practitioners in the study used inappropriate regimens for treatment of TB [52].

The majority of the private practitioners (89.74%) were aware of where TB patients could get free anti-TB drugs, but few of them (33.33%) referred to the health center, while the rest (66.67%) treat their patients with TB in their clinic and consequently patients treated in the private sector are less likely to be notified to the NTP. Suleiman *et al* found that of the 53 doctors enrolled in the study, 32 (64%) had treated TB patients during the previous year, but only 1 had reported to the authorities [31]. Another study done in Pakistan by Ahmed *et al* in 2009 showed that the majority (80%) of the private doctors interviewed, treated their patients in their clinic without referral [41].

The survey found that the majority of the patients were prescribed for inappropriate dosage of anti-TB drugs according to the prescriptions collected from the pharmacies. There were similar finding in a research done in Nairobi Kenya by Dr. Musila where of the 97 patients recruited in the study, only 19(19.6%) had the correct dosage [54]. On individual dosage calculation, isoniazid was correctly prescribed for 2(4.17%) of patients, while rifampicin and pyrazinamide were

prescribed correctly for 21(43.75%) and 3 (10.34%) of patients respectively. These figure were similar to those for Dr. Musila' study in which isoniazid was incorrectly prescribed in 71.9% of the patients followed by rifampicin (59.2%) and pyrazinamide (54.7%) respectively [54]. Because the treatment of TB requires multidrug regimens, WHO approved fixed dose combination for treatment of TB [55]. Of the 48 prescriptions collected, 61% of patients were given FDC not approved by WHO Model List of Essential Medicines. A recent survey and testing of anti-TB drugs in Somalia done by the Ministry of Health revealed wide spread existence of sub-standard drugs in Mogadishu pharmacies. These include RIP-PED, Rizide, Rifamide, Rifapyrazide, Refalin, RIFO, RIPO Forte, FDC of Rifampicin-Isoniazid-Pyrazinamide-Ethambutol, TPUTE-RIPE and Ripezide. This quality analysis of anti-TB drugs in Mogadishu was done in the National Quality Control Laboratory in Kenya [16]. The researcher found that most anti-TB drugs that were prescribed to the children with TB are those substandard drugs that were listed above. This shows that children managed in the private sectors were receiving anti-TB drugs of poor quality.

The results of the study were influenced by some limitations. First, the participants may have prepared themselves for the interview and provided information according the guidelines, which is not reflecting their real practice. This is may be related to the inconsistency between the knowledge regarding treatment of paediatric TB and the prescriptions collected from the pharmacies written by those clinicians recruited in the study, where overall 23% of the participants mentioned the recommended treatment of paediatric TB, but only one prescription was correctly prescribed. Second, There is limited data related to private medical practitioners registered by the department of health in Somalia. The researcher was forced to collect the data from different districts of Mogadishu, asking assistance from medical practitioners, pharmacists and other health workers to find out private medical practitioners that were running private hospitals or clinics in their district. This could affect the generalizability of the study to the clinicians in Mogadishu.

In summary, there is poor level of knowledge and practice of the practitioners in Mogadishu regarding diagnosis and treatment of paediatric TB, reflecting the clearly need for urgent TB-related training to the private sector.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

- There was limited access to continuing medical education on TB with only 9(23.08%) of the respondents attending TB-related training in the two years prior to the study.
- There was incomplete knowledge of the symptoms of tuberculosis in childhood. Overall, most of the practitioners correctly identified that fever for more than 2 week (87.19%), cough more than 2 weeks (89.74%) and loss of weight (92.31%) should lead them to suspect TB disease in children. Very few of them 5 (12.82%) mentioned that they use history of TB contact, a very important piece of history to suspect paediatric TB.
- Generally there was incomplete investigation of children suspected to have paediatric tuberculosis. More than half of the practitioners 21(53.85%) relied on CXR plus ESR for the diagnosis of tuberculosis in children, while 16 (41.03%) relied on CXR alone. None of the clinicians considered Mantoux test as a tool for investigation of TB in children.
- There was uneven knowledge of the different syndromes of tuberculosis. Up to two third of the private practitioners knew the recommended regimens for treatment of pulmonary TB but very poor knowledge regarding other TB syndromes. About 60% of the clinicians did not know or not recommend the appropriate dosage for extra-pulmonary TB, while 79.49% did not know the recommended treatment of TB/HIV co-infection.
- About 90% of the clinicians were aware of where TB patients could get free anti-TB drugs, but one third (33.33) refer their patients.
- Of the 48 prescriptions collected, only one prescription was correctly prescribed according to the weight of the child. On individual dosage calculation, isoniazid was incorrectly prescribed in 95% of the patients followed by pyrazinamide 86%.
- Only 18 (39 %) of the prescriptions used the recommended FDC approved by the WHO, while the remaining 61% were using FDC not recommended by the WHO.

6.2 RECOMMENDATIONS

- The Ministry of Health in Somalia should establish continuous medical education to the private practitioners in Mogadishu regarding diagnosis and treatment of paediatric TB.
- Another study should be conducted among the public doctors who are managing children diagnosed with TB admitted to the paediatric wards in the public hospitals.
- A follow up study should be conducted after training or sensitization offered to the study participants to assess improvement in knowledge and practice.

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APPENDIXES

4.4 APPENDIX 1: INFORMATION AND CONSENT FORM Study number

PART A: Information sheet

Date _____

The following information is to enable you to give voluntary informed consent to your participation in this study. Please read the information carefully before signing the consent form (PART B).

STUDY TITLE: Knowledge and Practice of Private Medical Practitioners in Mogadishu Regarding Diagnosis and Treatment of Pediatric Tuberculosis.

PURPOSE OF THE STUDY: As part of the requirements for master degree at the University of Nairobi, I have to carry out a research study. The study is focusing the management of children with tuberculosis by the private practitioners in Mogadishu.

WHY HAVE YOU BEEN ASKED TO TAKE PART? You have been asked because you are specifically suitable to provide data for my study. I have a questionnaire with a set of questions that I request you to fill.

BENEFITS FOR PARTICIPATING: Your participation in this study is completely voluntary and you may refuse to answer any question or choose to stop participating at any time. There is no monetary or financial benefit you drive from the study. There will be no compensation or reimbursement in your participation in the study. If you participate, the information you will provide it will help for the improvement of management of children with tuberculosis.

RISK FOR THE PARTICIPATING: Apart from the time taken away for the completion of questionnaire (approximately 20 minutes) that my take away from other activities, no other risk are foreseen.

CONFIDENTIALITY: All information you supply during the research will be held in confidence and, unless you specifically indicate your consent, your name will not appear in any report or publication of the research. You will be identified only by a code and your personal information will be handled with a high level of confidentiality. Your data will be safely stored in a locked

facility and only the researcher and his supervisors will have access to this information. After completion of the study all your personal information will be destroyed.

WITHDRAWAL FROM THE STUDY: You can stop participating in the study at any time and without giving reasons for your withdrawal. Failure to participate in this study will not be used against you & will not affect your relationship with the researcher

Please feel free to ask any questions about the study. If there is any part of this form that you do not understand, be sure to ask questions about it. You can also contact me after the interview for any clarification or questions on the study.

Abdihalim Mohamoud Sheikh
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Email: drabdihalim@gmail.com
OR
Chairperson,
KNH/UON Ethical review Secretariat,
P.O. BOX, 20723- 000202
Nairobi-Kenya

PART B: Consent form

I ……. agree to participate in this study, conducted by Dr. Abdihalim M. Sheikh
I have understood the nature of this study and wish to participate. I am participating as voluntarily.
I understood that I could withdraw from the study, without giving reasons, at any time, whether before it starts or while I am participating.
I have received answers to all questions that I asked to the researcher.
My signature below indicates my consent.

Signature _____ Date _____
Participant

Signature _____ Date _____
Researcher

4.5 APPENDIX 2: STUDY INSTRUMENT

Study number

Date _____

This is for academic only. Please complete the questionnaire according to your personal experiences; don't write your name. It will be kept confidential

Please mark with a tick (√) where applicable, you can mark more than one answer.

Please write the name of district that you practice in the empty box below

1. What is your title as a health worker?
    a. Medical doctor
    b. Clinical officer
    c. Others ……
2. How many years you are practicing as a medical private practitioner?
    a. >2 years b. 2 - 5years c. 5 - 10 years d. >10 years
3. Have you managed any child with TB disease for the last 2 years?
    a. Yes b. No
4. What are the signs and symptoms you use to reach diagnosis of TB in children?
    a. …….
    b. ……..
    c. ……
    d. ……
    e. ……..
5. Which other diseases that commonly associated with TB in children
    a. Asthma
    b. Leprosy
    c. HIV/AIDS
    d. Other ……
6. What is the most common method that you use daily to reach diagnosis of TB in children?
    a. Sputum
    b. Chest X-ray
    c. ESR
    d. Mantoux tuberculin skin test (TST)
    e. Clinical symptoms
    f. Others ……. Specify

7. For treatment of TB, which combinations of anti-TB drug are treated for the following TB diseases? Please write
   Pulmonary TB……
   TB meningitis……
   Military TB……
   TB in the context of HIV infection. ……..

8. Do you have challenges of accessing these drugs?
   a. Yes b. No
9. Does the lack of drugs affect your prescription practice?
   a. Most times
   b. Some times
   c. None
10. What is your ideal prescription for a child diagnosed with tuberculosis? Please write
    ……
    Duration of treatment……
11. Do you know where TB patient can get free anti-TB drugs?
    a. Yes b. No
12. Do you refer TB patients to any other health center?
    a. Yes b. No
13. How frequently do you follow up your case?
    a. Monthly
    b. Every 2 month
    c. Once in 3 month
    d. After completion of medication
    e. None
14. Have you attend any training of TB for the last 2 years?
    a. Yes b. No
15. Do you have the national or WHO guideline for the diagnosis & treatment of TB available in your clinic?
    a. Yes b. No
    If yes. Can I see it?

    Name of the guideline: ……..
    Year of publication …….
    Do you have any other material that helps to guide you in diagnosis and treatment of tuberculosis (eg. textbooks)? Please write the names
    ……
    ……
    ……

4.6 APPENDIX 3: FORM FOR FILLING THE INFORMATION IN THE PRESCRIPTION WRITTEN BY THE PRIVATE PRACTIONERS IN MOGADISHU.

Date	
Form NO.	
Date of the prescription written	
Age the child in the prescription	
Weight of the child in the prescription	
The name of anti-TB drug in the prescription	
The chemical name of the anti-TB drug in the prescription	
Dose of the anti-TB drug in the prescription	
Duration of the anti-TB drug in the prescription	