

Medical Education Interventions on Non-Adherence to Tuberculosis Treatment among Tb Patients in Kericho and Nakuru Counties, Kenya.

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Abstract

Background: Tuberculosis (TB) continues to be a major cause of high morbidity and mortality in Kenya. Adherence to TB treatment is one of the interventions that lead to increase in cure rate thus reducing mortality and emergence of Multi drug resistant tuberculosis (MDR) and high cost of treatment. This study focused on TB patients in urban and rural areas of Kericho and Nakuru Counties of Kenya.

Objective: The objective of the study was to identify medical education interventions that can reduce non-adherence to Tuberculosis Treatment among Tb patients in Kericho and Nakuru counties.

Methods: A purposive sampling method was used to carry out a cross sectional descriptive survey with retrospective cohort of non-adherent TB patients. Target population was smear positive TB patients registered in the TB registers in the two counties, within the past six months (June-December 2015) at the commencement date of the study. Data was collected using developed interview schedules and questionnaires. Respondents were traced non-adherent smear positive TB patients (defaulters) and health care workers. Age, gender, inadequate knowledge, ignorance on need for treatment adherence, stigma, alcoholism, social and economic factors such as low income, lack of social support, low education, financial problems, drug side effects were analyzed using SPSS platform that generated graphs and tables.

Results: Feeling well soon after medication initiation, drug side effects, stigma, alcoholism, low educational level, poor financial status, unemployment, shortage of Tb drugs including unavailability of pyridoxine which is essential in counteracting drug side effects were associated with defaulting. Healthcare workers were found to be poorly prepared to treat Tb patients. Existing training curricula in training institutions are deficient and wanting in components of management skills and devoid of soft skills applications.

Conclusion: Socio-demographic and socio-cultural/economic factors associated with non-adherence to treatment included ignorance on need for treatment adherence, stigma, alcoholism, poverty, low income and inadequately prepared healthcare workers who seemed poor in treating Tb patients. Available training curricula in training institutions are inappropriate.

Recommendations: A deliberate and sustained plan on patients' health education regarding adherence to medication and stigma reduction must be emphasized. Staffs' updates on Tb treatment must be regularly enhanced through continuing medical education forums. Existing training curricula in training institutions need to be revised and updated to include practical components that touch on patients' management skills reinforced with mandatory hands on soft skills applications for all trainees.

Keywords: Non-Adherence, TB Treatment, Defaulter, Patient Factor, Tuberculosis

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I. Introduction

1.1. Background

Tuberculosis (TB) is one of the world's deadliest communicable diseases and remains a global public health problem with significant morbidity and mortality.^[1, 2] In 2013, an estimated 9.0 million people developed TB and 1.5 million died from the disease, 360 000 of whom were HIV-positive. Globally, the tuberculosis (TB) mortality rate has fallen by 41 % since 1990, and the world is on track to reach the global target of a 50 % reduction during 2015.^[3] However, global TB control has faced many challenges, with an estimated 8.7 million incident cases in 2011 and 1.4 million deaths from TB since 2011. It is well known that non adherence to TB treatment leads to high increase in morbidity and mortality, prolonged TB infectiousness, multi-drug resistance, relapse and death and high cost of TB treatment which translates to increased burden not only to the nation but

to the community TB control interventions. Non-compliance to prescribed drug regimens is a major challenge to attainment of TB treatment goal which is to cure patients once they start treatment. Progress in responding to multidrug-resistant TB (MDR-TB) remains slow,^[3] particularly in high-burden countries where the incidence of MDR-TB is unacceptably high.^[3, 4] In addition, global economic crises and reduced investments in health services threaten national tuberculosis control programs.^[3,5,6]

As noted earlier, TB is slowly declining each year and it is estimated that 37 million lives were saved between 2000 and 2013 through effective diagnosis and treatment 2013 (WHO Global tuberculosis report 2014). Given that most deaths from TB are preventable, the death toll from the disease is still unacceptably high and efforts to combat it must be accelerated if the 2015 global targets, set within the context of the Millennium Development Goals (MDGs), are to be met. The MDG 6, Target 6.c: was to halt and begin to reverse the incidence of TB by 2015 and reduce prevalence of TB and deaths due to TB by 50% compared with a baseline of 1990 (WHO Global Tuberculosis Report 2014).

The Kenya National Tuberculosis, Leprosy and Lung Disease Program (NTLD-P) has been implementing initiatives towards achieving internationally agreed TB control targets whose immediate short-term goal was to achieve 70/85 targets – that is, to detect 70 % of infectious TB and cure 85% of the detected cases and then sustain this effort over a long time. The TB MDG to have halted and begin to reverse the incidence and mortality due to TB by 2015 has been met in Kenya and the NTLD-P has begun to implement the post 2015 Global TB Strategy that consists of 3 major areas, namely: *integrated, patient-centred care and prevention; bold policies and supportive systems and intensified research and innovation* (National Tuberculosis, Leprosy and Lung Disease Program – 2016). To affirm this goal during the commemoration of the World TB day on March 24, 2016, the Principal Secretary, Ministry of Health, Dr Nicholas Muraguri, recounted that, “Over the last 10 years, a total of 1.2 million Kenyans have been diagnosed with TB and one million TB patients treated successfully, averting an estimated half a million TB deaths. Moreover, free TB services have been accessible to Kenyans across 4,500 health facilities and 1,800 testing sites, and that Kenya remains the first country in sub-Saharan Africa to reach World Health Organisation targets for TB case detection and treatment success.”

1.2. Objective of the Study

The objective of the study was to identify medical education interventions that can reduce non-adherence to Tuberculosis Treatment among Tb patients in Kericho and Nakuru counties.

1.3. Research Question

What are medical education interventions that can reduce non-adherence to Tuberculosis Treatment among Tb patients?

1.4. Literature Review

1.4.1. Non-adherence to TB treatment

Successful treatment of tuberculosis involves taking anti-tuberculosis drugs for at least six months. Kenya subscribes to the internationally accepted World Health Organization (WHO) strategy for TB control. In addition, the country has adopted the WHO recommended tuberculosis treatment regimes. Although treatment duration for new TB patients in Kenya was previously 8 months in total, a shorter 6-months regime was started in 2007 in Nairobi province and later expanded to cover the whole country by 2009. Consequently, duration of treatment then was either six or eight months. In the first two months of treatment (intensive phase), a combination dose of rifampicin (R), isoniazid (H), pyrazinamide (Z) and ethambutol (E) (2RHZE) was used daily for two (2) months, followed by either 6 months of ethambutol and isoniazid (6EH) for the 8 months regime; or 4 months of rifampicin and isoniazid (4RH) for the 6 months regime. During the intensive phase of treatment, patients collect drugs from facilities weekly while monthly collections are done during the continuation phase. The treatment regime for retreatment patients is 8 months and includes Streptomycin (S) in the first 2 months. Emphasis is made on Direct Observation of Treatment (DOT) by a health worker or other responsible persons, including household members or others with whom the patient has a close relationship, at least during the intensive phase of treatment.

Non-adherence to prescribed drug regimens is a major challenge to attainment of TB treatment goal which is to cure patients once they start treatment. Compliance to treatment is important as it helps reduce risks of treatment failure and drug resistance, morbidity and mortality. The Kenya TB treatment defaulter rate is 15% (Global Tuberculosis Report 2013 www.who.int/tb/data). Adherence to TB treatment is one of the factors that lead to increase in cure rate and reduction in morbidity and mortality and also decreased emergence of multi drug resistant tuberculosis (MDR TB). Emergence of MDR TB results in high cost of treatment.

The WHO recommended Directly Observed Treatment Short Course (DOTS) strategy was introduced in Kenya in 1993 reaching 100% geographic coverage by 1997. In 2008, Kenya was ranked 13th among the twenty two (22) countries with high TB burden globally. Now it is ranked 15th (Global Tuberculosis Report 2013).

1.4.2. Therapeutic Adherence and Role of Medical Education in Disease Management

Therapeutic adherence/compliance not only includes patient compliance with medication but also with diet, exercise, or life style changes. In order to evaluate the possible impact of therapeutic non-adherence on clinical outcomes, numerous studies using various methods have been conducted in the United States (USA), United Kingdom (UK), Australia, Canada and other countries to evaluate the rate of therapeutic adherence/compliance in different diseases and different patient populations. Generally speaking, it was estimated that the adherence/compliance rate of long-term medication therapies was between 40% and 50%. The rate of adherence/compliance for short-term therapy was much higher at between 70% and 80%, while the compliance with lifestyle changes was the lowest at 20%–30% (DiMatteo 1995). Furthermore, the rates of non-adherence/compliance with different types of treatment also differ greatly. It should be noted that, if the patients do not follow or adhere to the treatment plan faithfully, the intended beneficial effects of even the most carefully and scientifically-based treatment plan will not be realized.

In healthcare, compliance is defined as the extent to which a patient's behaviour (in terms of taking medication, following diets, or executing life style changes) coincides with healthcare providers' recommendations for health and medical advice (Sackett 1976). Therapeutic non-compliance occurs when an individual's health-seeking or maintenance behaviour lacks congruence with the recommendations as prescribed by a healthcare provider. **Adherence** is often used interchangeably with **compliance**. Adherence is defined as the ability and willingness to abide by a prescribed therapeutic regimen (Inkster 2006).

Face-to-face discussions with patients about Tb are vital towards achieving an adequate fundamental understanding of TB and removal of confusion about community perceived stigma related to the disease. Many factors contributing to persistent patient confusion include underlying health care anxiety; ethnic, cultural and language barriers; and information provided in an incomprehensive manner to patients with limited educational backgrounds. These problems are not limited to only low- and middle-income countries, as similar patient misconceptions and barriers between effective patient-health provider communications commonly are encountered within Europe, Canada and the U.S.^[7] Within busy hospital or outpatient clinic practices, health providers often will not have adequate time for more detailed discussions with their patients about TB. This particular problem is notably compounded among many TB clinics within low- and middle-income countries, where the incidence of TB is generally much higher compared to the U.S. Indeed, many TB clinics within the two counties are typically very busy, and actual provider face-time spent with patients can be quite limited.

It was also found that patients' poor communication with healthcare providers was also likely to cause a negative effect on patient's compliance (Bartlett et al 1984; Apter et al 1998). These observations emphasize the need for cooperation between patients and healthcare providers and the importance of good communication. Good communication is also very important to help patients understand their condition and therapy (Lorenc and Branthwaite 1993). Compliance also requires that patients should be literate or have good literacy. Health literacy means patients are able to read, understand, remember medication instructions, and act on health information (Vlasnik et al 2005). In some studies, it was found that patients with low health literacy were reported to be less compliant with their therapy (Nichols-English and Poirier 2000). On the contrary, patients who could read and understand drug labels were found to be more likely to have good compliance (Murray et al 1986; Lorenc and Branthwaite 1993; Butterworth et al 2004). Thus, using written instructions and pictograms on medicine labels has proven to be effective in improving patient's compliance (Dowse and Ehlers 2005; Segador et al 2005).

Adherence to long-term therapies is thus a multidimensional phenomenon determined by the interplay of five sets of factors (dimensions) namely; social and economic factors, health care team and system-related factors, condition-related factors, therapy-related and patient-related factors.^[8] Improving treatment outcomes and designing effective interventions require understanding of the factors that prevent people from adhering and those that help in treatment completion. In Sub-Saharan Africa, several social and economic factors such as low income, lack of social support, low education, financial problems and inability to afford services^[9, 10] have been linked to TB treatment non-adherence. Older age, the male sex, inadequate knowledge, ignorance on need for treatment compliance and stigma^[10-14] are among reported patient-related factors that influence default in the region. Reported health care system-related factors for default include poor service provider attitudes, negative attitude by tuberculosis patients towards the treatment centre, running out of drugs, access to health services and living near to treatment centre^[10, 13, 14]. Side effects, drugs too strong, and feeling better^[10, 13, 15] are among therapy related factors that influence TB treatment default while HIV co-morbidity is among the condition-related factor reported.^[11]

Interventions promoting better health care provider-patient communication about adherence; developing or improving existing adherence support services that are offered by a multidisciplinary team (nurse, physician, pharmacy, patient et cetera) may be the single most important **area of focus** when we consider the training of clinicians which by and large was based on traditional mode of health worker training i.e. the lecture method which has been the main instructional method in traditional education. The teaching of medical

education has utilized the subject-centred curriculum for many years. It is built upon certain subjects that are considered essential and specific time is allocated to each. The student first studies the basic sciences and then the clinical sciences. This method of teaching assumes that extensive factual knowledge is essential for the practice of health professionals including medicine, and that this knowledge should precede the stimulus situation (the health problem or situation).

The fragmentation of education into separate disciplines contrasts the new paradigm of health and medicine and of course other health professions with their "holistic approach" (Ferguson 1980). The concept of integration can be misunderstood and the so called integrated curriculum can simply be segmented differently on the basis of organ/systems, pathophysiological processes or other similar classifications. Therefore, to design a relevant and effective integrated curriculum one has to consider the following factors which have been highlighted by Hilliard Jason (1972) in a paper on "Integration in Medical Curriculum: Advantages and Disadvantages." This includes the basic sciences with each other, the clinical sciences with each other, the basic sciences with the clinical sciences, and the medical school with the community.

Medical students are not receiving the kind of one-to-one attention that was once the hallmark of medical education, neither during the teaching laboratories of the basic science years nor during the clerkships in the clinical years. In addition to a necessary change in the curriculum, what is also needed is a change on those who govern and participate in undergraduate medical education^[16]. This change must emphasize skills acquisition in patient management. It should be noted that knowledge gained during undergraduate medical curriculum almost becomes out-dated by the time the student graduates.

Practicing primary care physicians (clinicians) need to keep themselves updated with this expansion in knowledge and skills. There is therefore a dire need to train and equip health care providers with appropriate skills to manage TB patients. This calls for a paradigm shift in the entire continuum of current patient care as opposed to assumed competence by health care workers which has proven to be a mirage. This calls for re-training of trainers of healthcare professionals with emphasis on skills acquisition who must then produce competent healthcare workers to man the health care facilities.

The ultimate aim of appropriate training of clinicians is to produce all round clinicians who can adapt quickly to new modes of patient management and who should have appropriate skills to interact with their patients and colleagues in the continuum of patient care with respect to health education and health promotion. By **health education** we mean "any combination of planned learning experiences based on sound theories that provide individuals, groups, and communities the opportunity to acquire information and the skills needed to make quality health decisions."^[17] This is with respect to the teaching of the community and the public in the awareness of curative, disease prevention, health promotion and rehabilitative endeavors in their day to day survival. **Health promotion** here refers to "the process of enabling people to increase control over their health and its determinants, and thereby improve their health."^[18] This emphasises the efforts geared to sustaining good health and maximizing good health. Thus, good health goes beyond just existing/ surviving to thriving.

II. Methods

2.1. Research Design

A mixed method research design was used which combined both quantitative and qualitative methods in this study in which closed-ended (quantitative) and open-ended (qualitative) questions were addressed. The study utilized a retrospective cohort (Tb defaulters) with a mixed method approach comprising both interviews and focus group discussions. Interviews were done to all traced Tb defaulters, health workers from health facilities where defaulters were traced and focus group discussions with the County Tuberculosis and Leprosy Coordinators (CTLCs) and sub County Tuberculosis and Leprosy Coordinators (sCTLCs) of the two counties of Kericho and Nakuru.

2.2. Location of the Study

The study was conducted in urban and rural areas of Kericho and Nakuru Counties in Rift Valley Region. Rift Valley Region is one of Kenya's 8 regions, covering an area of 182,505.1 square kilometres and according to the 2009 Census had a population of 10,006,805. Kericho County is one of the 47 counties in Kenya with a population of 752,396 and an area of 2,111 km². Nakuru County is one of the largest counties in Kenya with a population of around 1.6 million, living on some 7,495 square kilometres in the central part of the country.

2.3. Study Population

Target population was identified smear positive non-adherent TB patients registered in the TB registers in the two counties. Study period was within the past six months at the commencement date of the study in January 2016.

Inclusion criteria: All registered smear positive non adherent TB patients within the past six (6) months of the study period were recruited for study.

Exclusion criteria: Transfer-ins and outs and patients with other disease conditions were not included in the study.

2.4. Sample Size

A total of 112 smear positive non-adherent TB patients from 34 health facilities (24 in Kericho County and 10 in Nakuru county) were purposively identified (62 from Kericho County and 50 from Nakuru County).

2.5. Sampling Frame

This involved non-adherent smear positive TB patients within the past six months at the commencement date of the study as per the TB registers. Key informant interviews involving a total of 46 health care workers (11 from Nakuru County and 35 from Kericho County) were carried out.

2.6. Instrumentation/Tools

Structured questionnaires and semi-structured interview schedules were used.

2.7. Reliability and Validity

For the reliability and validity of this study’s tools, piloting was done at Emingi location of Baringo County, a neighbouring county North – East of Nakuru County. The study tools were prepared in English.

2.8. Procedures for Data Collection

Data were collected using interview guides and questionnaires. Interviews were conducted by a trained research assistant, who was well versed and fluent in the local language.

2.9. Data Analysis

Data were analysed using SPSS v20. Results were presented in tables and graphical summaries.

2.10. Ethical Approval and Ethical Considerations

IREC, Moi University approved the protocol, consent form and interview schedule. An official permission was given by CTLCs and sCTLCS of the two counties of Nakuru and Kericho, prior to the interviews. During data collection, oral informed consent was obtained from all participants. Informed oral consent was also obtained from parents or guardians for subjects under 18 years old.

III. Results

3.1. Educational intervention shortcomings identified in the study

The study’s objective was to identify medical education interventions that can be applied to reduce non-adherence to Tuberculosis Treatment among Tb patients in Kericho and Nakuru counties.

Focus group discussions were held with County Tuberculosis and Leprosy Coordinators (CTLCs) and sub-County Tuberculosis and Leprosy Coordinators (sCTLCS) who are the managers and implementers of Tb programme in their respective counties. Their views were taken (Table 1 and 2) as they responded to questions of what they thought were the possible reasons why patients defaulted from Tb medication and what they thought were the possible interventions to curb the observed anomaly. Their views are as follows:

Table 1: Suggested Patients’ Reasons for default from Medication. Summary of Focus group views of Programme Managers’ suggested possible patients’ factors that lead to defaulting in Kericho and Nakuru counties.

Kericho County	Nakuru County
Alcoholism and tobacco smoking. Stigma associated with HIV. Lack of knowledge about Tb disease due to low level of education. Patient attitude toward medication – improvement in signs/symptoms (Relief), make patients assume they are cured prematurely. Pill burden – too many drugs to swallow which is a challenge especially if one is poor and cannot eat well. One gets discomfort if one swallows drugs on an empty stomach. Duration of treatment is long, making patients get drug fatigue. HIV co-morbidity resulting in pill burden since one has to take multiple drugs both for Tb and for HIV.	1. Age: The very young who are dependent on guardians have no one to collect drugs for them. Also very old or disabled e.g. blind 2. Gender: Males more than females because of nature of occupation - not given permission. Men work outside home, forget to refill drugs e.g. long distance truck drivers. 3. Level of education: – clients with low level of education default more due to lack of understanding on importance of treatment. 4. Singles: Tend to default, lack psychosocial support. No one to send for collection of drugs. 5. Beliefs: Others believe in divine healing e.g. Wakorinos. 6. Motivation – e.g. MDR patients are motivated by the money they are given and food support. 7. Attitude: Harsh approach to patients scares them away.

	<p>Alcohol and tobacco smoking contributes to defaulting as most patients – forget treatment not willingly for one or 2 doses.</p> <p>8. Route of Administration: Those on injectable tend to be compliant because of DOTS Prolonged treatment contributes for defaulting.</p> <p>9. Medication side effects contribute to defaulting e.g. nausea/vomiting, hepatotoxicity, peripheral neuropathy, red coloration of urine.</p> <p>10. Severity of Disease Patients who have severity of the disease tend to default.</p> <p>11. Disease co-morbidity Patients with Tb and HIV co-morbidity tend to default because of stigma, pill burden/or other co-morbidities.</p> <p>12. Imprisonment Imprisonment where Clients are released without proper contacts/address (transfers out)</p>
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Table 2: Suggested Interventions to reduce Patients’ default
Summary of Focus group views of Programme Managers’ suggested interventions to reduce Patients’ default from Tb Medication in Kericho and Nakuru counties.

Kericho County	Nakuru County
<p>Immediate Proper counselling and health education Equipping health care workers with proper knowledge on TB management Strengthening DOT strategy.</p> <p>Short-term Accessibility Decentralization – all health facilities to be equipped as TB treatment sites Involve psychosocial Health facility counsellors Continuous mobilization and sensitization in the community through CHVs.</p> <p>Long-term Reduce duration of treatment through research Strengthen DOTs Establish linkages with rehabilitation centres to deal with alcoholics.</p>	<p>Immediate Intensify adherence counselling during initiation of treatment and during clinic visits. Ensure availability of food support. Create positive environment for the clients in health facilities and also with health care workers.</p> <p>Short term Empower community health volunteers (CHVs) to assist in terms of counselling and defaulter tracing. Training of Health care workers on attitude change. Training of private practitioners on management of clients and also chemists who dispense drugs and reagents. Ensure laboratory services are decentralized.</p> <p>Long Term Interventions Continuous counselling and TB updates of healthcare workers. Infrastructure – building additional new health facilities to decentralize patients. To employ more personnel to assist in TB clinic management to reduce burn out of clinic staff. In future use ID numbers to register TB patients.</p>

3.2. Summary of Observed Tb Treatment Shortcomings

The following were observed and discussed with the Tb Programme Managers:

- i. Healthcare workers while treating Tb patients tend to focus on “**hard skills**”, or skills directly related to job duties like acquiring knowledge and a professional certificate and getting employed at the expense of “**soft skills**” which do not depend on acquired knowledge such as common sense, the ability to deal with people, and a positive flexible attitude when dealing with patients.
- ii. Soft skills, which do not depend on acquired knowledge such as common sense, the ability to deal with people, and a positive flexible attitude are never taught as they are not in the curriculum and so receive no attention.
- iii. Existing **training curricula** in training institutions are deficient and wanting in management skills and devoid of soft skills on diseases management in general.
- iv. In Tb clinics at the health facilities, two cadres of health staff namely nurses and clinical officers can be found handling Tb patients while others such as medical officers, pharmacists and public health officers are not generally involved. For instance:
 - 50% and 54% of the professionals treating patients were nurses while 50% and 37% were RCOs in Nakuru and Kericho counties respectively.
 - 43% of healthcare workers treating Tb patients in Nakuru County had never attended any Tb update workshop compared to 34% in Kericho County.
 - 93% and 91% of the healthcare workers in Nakuru and Kericho counties respectively had never performed any Tb work prior to being engaged in Tb activities in the various health facilities, thus making them incompetent in counselling as they lacked appropriate patient management skills.

- v. Healthcare workers are very poor in communication and adherence counselling skills, a situation which can be rectified through training while in training schools if curriculum is updated and revised and also through regularized staffs' Tb treatment updates which can also be enhanced through continuing medical education forums.

3.3. Discussion

From the study, more than 50% of the respondents were males and not married and that more than 65% of them were in the age group 21-39 years which is also the most economically active age group generally. In addition, more than 60% of the respondents in Nakuru were unemployed, compared with more than 50% who included students in Kericho which also revealed that 98% of respondents in Nakuru earned less than 5,000/= per month compared with 81% in Kericho county. In fact more than 80% of the respondents in the two counties admitted that they defaulted because of their financial challenges. More than **50%** (70% in Nakuru and 55% in Kericho) of the respondents had primary level and below of education. The main problem encountered here is that of a relatively young population of low socio-economic status and low educational level and that inadequately prepared healthcare workers who seemed poor in treating Tb seemed to have contributed to patients' non-adherence to Tb medication.

Thus in our context, social and economic factors such as low income, lack of social support, low education, financial problems and inability to afford services ^[9, 10] have been linked to TB treatment non-adherence. Additionally, younger age, the male sex, inadequate knowledge, ignorance on need for treatment compliance and stigma ^[10-14] are among reported patient-related factors that influence non-adherence to treatment.

Bagoes et al. (2009) also found that more patients take TB treatment according to prescription if they are clearly informed and costs for treatment are reduced. They concluded that non-adherence is a result of developed negative image towards the health care staff, treatment, and quality of medication. It was shown that patients and providers' personal character, abuse of substance, and religion influence treatment adherence.

Culqui D R (2012) study found that patients' compliance is associated with: patient's sex usually male, treatment experience especially feeling malaise, or past history of previous non-compliance, use of recreational drugs, dissatisfaction with the information received and presence of poverty. Muture B.N et al (2011) indicated that most frequent reasons for default cited by patients who did not complete the treatment course included ignorance about need for treatment compliance coupled with inadequate knowledge about TB and travelling outside treatment areas, consequently missing clinic appointment and running out of drugs.

Healthcare workers were found to be very poor in communication and adherence counselling skills, a situation which can be rectified through training while in training schools if curriculum is updated and revised and also through regularized staffs' Tb treatment updates which can also be enhanced through continuing medical education forums. This state of affairs seem to have contributed to non-adherence to Tb medication and is in agreement with past studies that have shown that patients' poor communication with healthcare providers was also likely to cause a negative effect on their compliance (Bartlett et al 1984; Apter et al 1998) and that good communication is also very important in helping patients understand their condition and therapy (Lorenc and Branthwaite 1993). Compliance also requires that patients should be literate or have good literacy. Health literacy means patients are able to read, understand, remember medication instructions, and act on health information (Vlasnik et al 2005). In some studies, it was found that patients with low health literacy were reported to be less compliant with their therapy (Nichols-English and Poirier 2000). On the contrary, patients who could read and understand drug labels were found to be more likely to have good compliance (Murray et al 1986; Lorenc and Branthwaite 1993; Butterworth et al 2004).

4. Summary, Conclusions and Recommendations

4.1. Summary of Intervention gaps identified

Intervention gaps identified included:

- i. Existing training curricula in training institutions are deficient and wanting in components of management skills and devoid of soft skills applications.
- ii. "Soft skills," which are very critical in patient management and which do not depend on acquired knowledge such as common sense, the ability to deal with people, and a positive flexible attitude are never taught as they are not in the curriculum and so receive no attention.
- iii. Healthcare workers always focus on hard skills, or skills directly related to acquisition of knowledge and a professional certificate so as to get employed and secure job duties at the expense of soft skills which do not depend on acquired knowledge such as common sense, the ability to deal with people, and a positive flexible attitude when dealing with patients.
- iv. Mainly nurses and clinical officers are involved in Tb patients' treatment leaving out other cadres of staff in the Ministry of health such as public health officers, pharmacists and medical officers.

- v. There is inadequate number of trained healthcare workers manning health facilities.
- vi. Tb updates for health facility staff are unscheduled and irregular.
- vii. There is deficiency and unsteady supply of pyridoxine which is essential in counteracting Tb drug side effects.

4.2. Conclusions

- i. Socio-demographic and socio-cultural/economic factors associated with non-adherence to treatment included ignorance on need for treatment adherence, stigma, alcoholism, poverty, low income
- ii. Inadequately prepared healthcare workers were poor in giving Tb treatment to patients.
- iii. Tb updates for health facility staff were unscheduled and irregular.
- iv. Healthcare workers always applied hard skills at the expense of soft skills when managing Tb patients.
- v. Existing training curricula in training institutions are deficient and wanting in components of management skills and devoid of soft skills applications.
- vi. There is deficiency and unsteady supply of pyridoxine which is essential in counteracting Tb drug side effects.

4.3. Recommendations

- i. A deliberate and sustained plan on patients' health education as a strategy in health promotion and prevention with specific emphasis on importance of adherence to medication and stigma reduction must be maintained by all healthcare workers.
- ii. Staffs' updates on Tb treatment must be regularly enhanced through continuing medical education forums.
- iii. For effective patient care, healthcare workers must at all times apply in equal measure both hard skills and soft skills when managing Tb patients.
- iv. Existing training curricula in training institutions need to be revised and updated to include practical components that touch on patients' management skills reinforced with mandatory hands on soft skills applications for all trainees.
- v. Supply of pyridoxine must be consistent and regular in all Tb clinics.

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