Full Length Research Paper

A model for improving treatment outcome of patient with drug-resistant tuberculosis in Ethiopia

Addisalem Yilma Tefera[1]; Sheila Mokoboto-Zwane[1]

[1]Affiliation: College of Human Sciences, Department of Health Studies, University of South Africa, Pretoria, South Africa.
Sheila Mokoboto-Zwane[1](co-author).

Abstract

Objective: To develop and describe a model for improving the treatment outcomes of patients with drug-resistant tuberculosis in Ethiopia. Methods: The study was conducted at Nineteen health facilities designated to provide service for patients with drug-resistant tuberculosis in Ethiopia. The researcher used a mixed method research design, both Quantitative and qualitative data collected to address the research questions. The findings from the quantitative cross sectional along with a qualitative, exploratory, descriptive, and contextual research design was used to identify the main concept, which is the initial step in theory/model development. The structure and process of the model were visually illustrated and described. Result: The findings of this study suggest that addressing the holistic need of patients at early phase of treatment could improve the patient's final treatment outcome. This could be strengthened by improving health care personnel' competence, creating a friendly environment, and involving family, community, and social support organizations in treatment planning and adherence support activities. Competence and supportive environment were identified as the main concept. Based on this, a model for improving the treatment outcomes of drug-resistant tuberculosis patients for health care practitioners was designed, visualized, and described. Conclusion: This model primarily developed to provide healthcare providers with a guide to the intervention required to provide individual patient care throughout the treatment process, as well as the required resources to support healthcare providers in improving service quality and, ultimately, to improve the treatment outcome of patients with drug-resistant tuberculosis in Ethiopia.

Key concepts: Communication; competence; counselling; drug-resistant tuberculosis; influence; patient-centred care; patient support; supportive environment; treatment adherence; treatment outcome.

INTRODUCTION

The second-line anti tuberculosis medications are the hope for patients with drug-resistant tuberculosis. The treatment is only effective with the active participation of the patient to overcome the challenges faced by both the health care provider and the health system in general (TB CARE, 2014).
Patient on anti-TB treatment should have got regular treatment follow up and support in health facilities. For this, health care providers should have knowledge and counselling skill to assess potential treatment adherence, psychological and socioeconomic barriers at the start and during the treatment process which most of the care providers are lacking (Daftary, Padayatchi, 2016).
According to WHO report (2019) Treatment success in patients with drug-resistant TB remain far from satisfactory; only 56% were successfully treated. Apart from this, 6.2% of patients with drug-resistant tuberculosis

Corresponding author email: addisalemy@gmail.com

cases have a risk of developing extensive drug-resistant TB.

Ethiopia's National tuberculosis control programme emphasises increasing access to the treatment service and establishing treatment-initiating centres in the region. Despite the effort made by the programme, unsuccessful drug-resistant tuberculosis treatment outcomes (lost to follow-up, treatment failure, and death) are still well-thought-out problems. As a result, extensive drug-resistant tuberculosis cases are being detected and referred to specialized hospitals for advanced care and treatment.

To overcome the challenge of an unsuccessful treatment outcome of the patient with drug-resistant tuberculosis, understanding specific barriers and enablers of treatment adherence is required. Therefore, this study assesses and explore factors influencing the treatment outcomes of patient with drug-resistant tuberculosis. The empirical finding of the study from the quantitative strand and the patients' lived experience and healthcare providers' opinion contributes to developing and propose a model to improve the treatment outcome of patient with drug-resistant tuberculosis and interventions.

Research objectives

Develop and describe a model to improve the treatment outcome of patient with drug-resistant tuberculosis in Ethiopia.

MATERIALS AND METHODS

This article forms part of a larger mixed method study design. The main thesis had two phases: an empirical and a theory-generative phase. This paper presents the latter, which was aimed at developing a model for improving the treatment outcome of patient with drug-resistant tuberculosis in Ethiopia. It describes a model development process follows the steps explained in Chinn and Kramer as follows: Identification of the main concept; Classify and define the main concepts; construction of the relationship between concepts; and description of the model structure and process (Chinn, Kramer, 2011).

Identification of the main concept

The researcher identified **competence** and **supportive environment** as key concepts, which served as a guide for the development of the model to improve the treatment outcomes for patients with drug-resistant tuberculosis. The empirical phase findings from both the quantitative and the qualitative strand of the study, which emerged from different sets of population groups (patients on drug-resistant treatment, patients released from care, and healthcare providers working in the centre), were supported to derive the concept that helps to develop the model to improve the treatment outcome of a patient with drug-resistant tuberculosis.

Classify and define the main concepts

The main concept, which originated from the study's empirical phase findings, was classified according to the survey list with six elements proposed by Dickoff, James and Wiedenbach survey list (1968). The elements entailed the agent, recipient, process, dynamic, context and terminus. The researcher's mental map is informed by Dickoff, James and Wiedenbach's (1968) survey list, as articulated by McEwen &Wills (2019) This is used to classify concepts of the model (Table 1).

Relating and structuring concepts: A concept map

Concept maps are designed to show how concepts relate to one another meaningfully. This makes it possible to clearly define and graphically represent a conceptual framework or model of any interesting topic or problem (McEwen Melanie and Evelyn M Wills, 2019; Novak & Gowin,1984).

In this study, competence and a supportive environment are the concepts that help to construct the model to achieve the desired treatment outcomes. Care providers' competence and a supportive environment are required to manage chronic diseases like tuberculosis, which require a long treatment period and are more prone to poor treatment adherence. Ideally, the healthcare providers must have the knowledge and skill to provide a comprehensive, respectful, compassionate, and caring service and ensure continuity of care by providing the necessary health information and arranging or linking up with other support structures. Engaging all actors in the treatment plan and throughout the process helps to improve treatment adherence.

Description of the model

The context, purpose and assumptions of the model are discussed.

The context within which the model is placed

The primary objective of a country's health system is disease prevention and control, and healthcare facilities are classified into three tiers to carry out their responsibilities in this regard. Patients with drug-resistant tuberculosis are mainly treated in hospitals; only a few health facilities are providing treatment across the country, and they are expected to meet all the requirements of patients. As a result, healthcare support should focus on the patient's problems and priorities to meet the patient's needs and develop a positive client-provider relationship. In order to address patient concerns that affect patient treatment adherence and

Table 1.   Classification of the main concepts using Dickoff's model.

Agent	• Healthcare providers
Recipient	• Client/ Patient with drug-resistant tuberculosis
Procedure	• This procedure entails patients and healthcare providers communication throughout the continuum of care and treatment.
Dynamics	• Existing capacity in terms of knowledge, and skill of care providers; leadership, resources, settings, and support groups to support the health system to provide comprehensive service for patient with drug-resistant tuberculosis.
Context	• Workplace, community, and home where patient stay and healthcare setting where patients are enrolled to treatment service
Terminus	• Improved competence of the healthcare providers in terms of counselling and communication • Improved treatment adherence of patient with drug-resistant tuberculosis with goal of improving successful treatment outcome.

the continuum of care, guiding principles or a framework must be used to uniformly apply across health settings and help healthcare practitioners adhere to the model of care principles.

Theoretical definitions of the key concepts of the model

A theoretical definition uses other theoretical terms to define a concept and place it within the theory's context, but it does not offer practical techniques for classifying or measuring it (Walker & Avant, 2011).
Competence refers to the behaviour of integrating and combining internal and external resources. In the context of drug-resistant tuberculosis clinical practice, integrating the healthcare human resource with external resources such as support from family, workplaces, community, and social support groups necessitates commitment and skills in order to influence and mobilise resources and use of the resource in patient care management (Fernandez, Seligman, Quan , Stern, & Jacobs, 2012).
Supportive environment is characterised by relationships of trust and respect between the healthcare providers and among patients and their families. It is one in which patients are encouraged, supported, and challenged, as well as having a good attitude toward the treatment they receive and increasing their participation in their care. A supportive environment is essential for achieving the intended patient care and support plan (Gordin, 2015). Creating a supportive environment might not require much investment in some activities in the healthcare setting, for example, making waiting rooms feel welcoming and greeting patients with their own language. In general, a conducive environment in the

subsequent helps enhance the trust-building process and support treatment adherence.

Purpose of the model

It is crucial to clarify how the model is used while defining its purpose. This emphasizes the circumstances and specifications under which it is used and who is responsible for carrying it out (Chinn & Kramer, 2011). This model primarily proposed to provide healthcare providers with a guide to the intervention required to provide individual patient care throughout the treatment process, as well as the required resources to assist healthcare providers in improving service quality and, ultimately, to improve the treatment outcome of patients with drug-resistant tuberculosis in Ethiopia.

Assumptions of the model

• Assumptions are the underlying givens or accepted truths that underpin theoretical reasoning. Despite the lack of systematic empirical proof, they are a structural component of theory that is taken for granted or considered to be true. Because they are conceivable in the model, they are assumed to be true (Chinn & Kramer,2011). When developing a model to enhance the treatment outcome of patients with drug-resistant tuberculosis, the following assumptions were taken into account.
• Patients' treatment outcomes are also influenced by socio-economic and psychological support and other factors; a detailed assessment and plan should be included in the care plan.

• Access to information, including medical advice, should not be limited to face-to-face discussions with healthcare providers; remote consultation using advanced technology, including arranging free dialling numbers and SMS, should be incorporated as part of treatment adherence support.

• Using survivors of drug-resistant tuberculosis as counsellors and treatment supporters would allow for more informed decisions, better adherence, and treatment outcomes.

• Patient preference should be prioritised as part of treatment planning.

• Conducive working environment that is well-equipped with essential medical supplies; trained and motivated healthcare providers should be in place to improve the quality of services.

• Patients with comorbidities should receive treatment free of charge during TB treatment, and continuity of care should be ensured after completing treatment through integrated service with the appropriate health institute.

The structure of the Model

The proposed model is designed to help programme managers and healthcare professionals in improving the treatment outcomes for patients with drug-resistant tuberculosis. The graphic illustration guides in comprehending the necessary knowledge and skill required to develop patient care plans by outlining the aspects that must be considered (Fig 1). This model might be used in Ethiopian health facilities dedicated to the treatment of drug-resistant tuberculosis. The model could be applied to other developing countries with comparable challenges in dealing with drug-resistant tuberculosis.

Description of the model

The researcher employed a variety of shapes and colours during model development illustrates the model's structural presentation for improving treatment outcomes of patients with drug-resistant tuberculosis. The model's components are:

Addressing the competence needs of healthcare providers

The grey area at the bottom of the image represents the starting point of the suggested model (see figure 1). The four fundamental, interdependent factors that contribute to a particular outcome of interest are depicted in Figure 1. To identify patient problems and plan for patient-centred care, healthcare workers should have the knowledge and skill to critically analyse patients' needs. In the health facilities examined in this study, such activities are not consistently and fully implemented.

The first step is to bridge the skills gap in assessing the clinical, socio-economic, and psychological well-being and related behaviours and spiritual health of patients with drug-resistant tuberculosis. Comprehensive knowledge and skill in identifying and addressing problems that patients may encounter, as well as planning how to support them in adhering to their treatment plan and achieving the positive treatment outcomes that we all hope for, is critical.

Second, the researcher suggests adopting/developing standardised patient assessment tools to assist healthcare professionals in determining the patient's comprehensive needs.

Improving competence

Managers employ a variety of techniques to improve their employees' competency. Based on the findings of this study, and in conjunction with the need for healthcare providers to address the patients' comprehensive needs. The researcher developed a list of recommendations to improve counselling, communication, and resource mobilization skills. One of the suggested changes is to include a practical exercise as part of basic training. This includes field practice during actual training and practical attachment at the health facility where a patient with drug-resistant tuberculosis is being treated. This would help to improve counselling and communication skills. Furthermore, the more engaged in the care and support of patients with drug-resistant tuberculosis, the more healthcare providers look for local resources to fulfil the patient's needs, special to address the socio-economic need of the patients. Thus, improving the competence of the healthcare provider not only addresses the clinical aspect of the patient's needs but also the economic and psychosocial needs of the patients.

Strengthen patient adherence system

The researcher proposed a mechanism to improve the treatment adherence of the patients. This includes:

Strengthen adherence support mechanism & tools: Healthcare professionals and programme managers would organise the implementation or improvement of treatment adherence support mechanisms. The use of digital technology (for example, setting SMS or phone reminders), planning experience-sharing programmes with peer support systems/groups, preparing patients and families by holding meetings to inform them of the benefits of treatment adherence, the risk of potential drug resistance if treatment adherence is not maintained; assessing and identifying cultural beliefs and misconceptions that may interfere with treatment adherence and addressing them as soon as possible would help to strengthen the treatment adherence support.

Build a trusting relationship: To build a smooth and reliable connection, the patient must be treated with
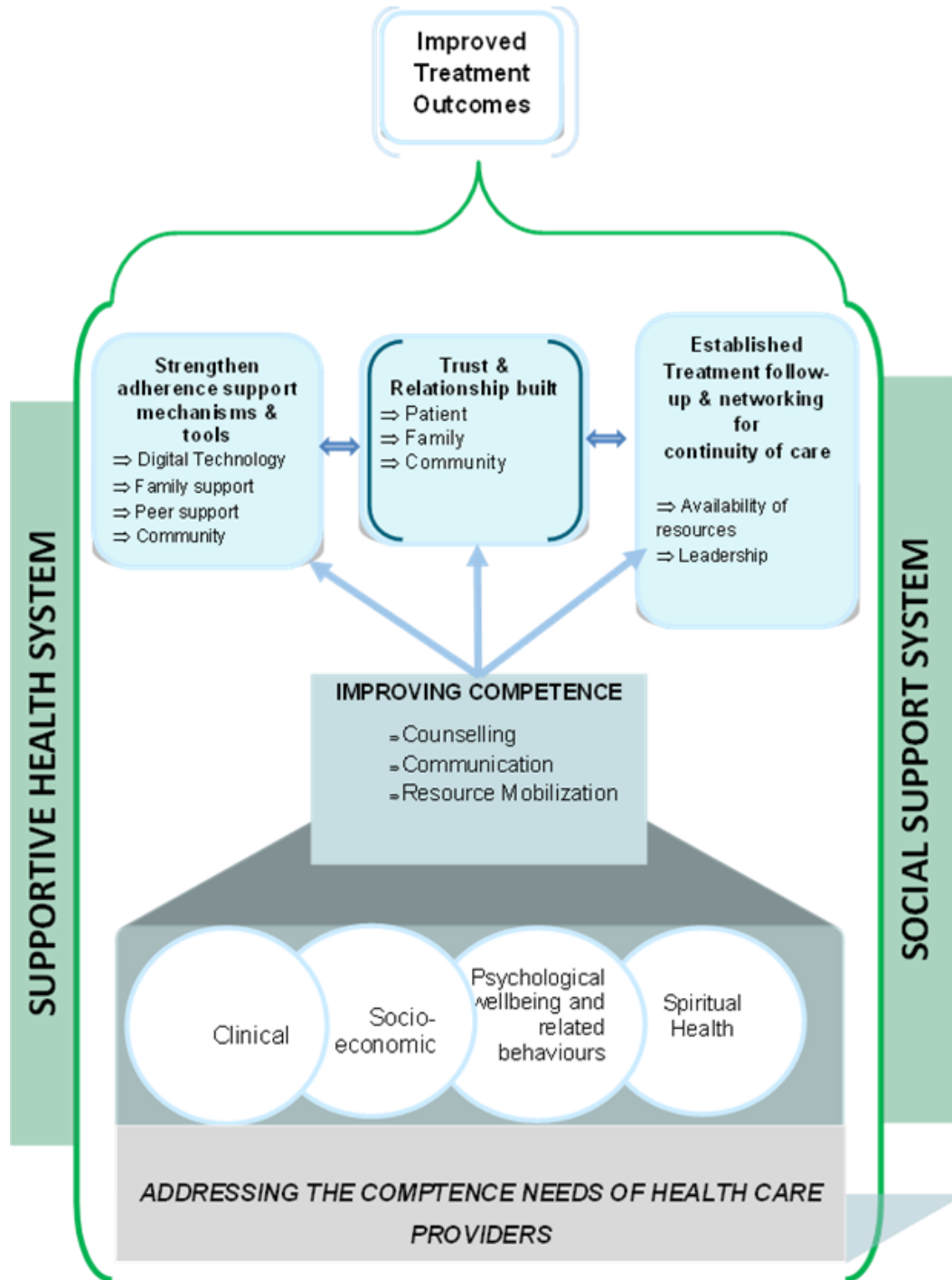
Figure 1. Structural description of a model developed for programme managers and healthcare providers to improve the treatment come of patients with drug-resistant tuberculosis.

respect and decency. For this kind of interaction to occur, the patient should be at the forefront of the decision-making process. Therefore, healthcare professionals should give patients enough time to discuss any concerns they may have on the course of their treatment and related difficulties, always actively listen to their worries, and assist them in coming up with answers to their patient problems. This phase is also beneficial for enhancing the patient's relationship with their family and dispelling misunderstandings about the patient's sickness

and the safety measures that should be done to prevent the spread of disease.

Established treatment follow-up & networking for continuity of care: Identifying health facilities nearby the patient's residence, communicating ahead of time before arranging for the patient for discharge from the treatment-initiating centre, and assessing the capacity of care providers and availing necessary capacity building on the job training and practical attachment, identifying family support and community health worker involved in the treatment adherence support and provide them necessary orientation on their role would help to establish the treatment follow-up support and networking for continuity of care. This requires the support of leadership at all levels in terms of monitoring, resource mobilization, and providing direction in order to improve treatment adherence and outcomes.

Supportive health system

The health system is the main influencing factor in improving the treatment adherence and treatment outcomes of patients with drug-resistant tuberculosis. The commitment and leadership role of the health system management in terms of building the capacity of healthcare providers, arranging motivation schemes, including a conducive working environment for healthcare providers in providing quality service, and the mobilisation of resources to address the psychosocial needs of the patients, is crucial in improving the treatment outcomes. The health system alone might not produce successful treatment outcomes unless the service is integrated with a social support system. This is also illustrated in green colour in the model.

Social support system

The social support system or an environment outside the health setting would help mobilize resources to support the patient in terms of financial support, information support to address misinformation about the disease, and emotional support to strengthen the patient and improve treatment adherence. It also aids in the reduction of stigma and discrimination in the community.

In this regard, the leadership of the health system and social support groups is critical in enhancing and improving relationships among care providers, patients' families, and society at large in order to improve treatment adherence and continuity of care.

Ethical approval

The article forms part of a larger mixed method study design approved by UNISA's Health Studies Research Ethics Committee (ref. no. HSHDC/587/2017).

Study limitations

This paper presents the steps used to develop a model for improving the treatment outcome of patients with drug-resistant tuberculosis. The researcher presented the model for experts in the field and evaluated for the clarity, consistency, simplicity, generality, and accessibility. However, as a result of time and resources limit, unable to apply the model into practice.

CONCLUSION AND RECOMMENDATIONS

This article comprises a comprehensive description of a model for improving the treatment outcomes of patients with drug-resistant tuberculosis using model development steps explained by Chinn and Kramer (2011). A graphic representation of the model enhanced the structural clarity of the concepts within the model. The purpose of developing this model is to improve the competence of health care program lead and healthcare providers. The model must be operationalised in the clinical care. Further evaluate the effectiveness and feasibility of the model in improving the treatment outcome of patient with drug-resistant tuberculosis. It is imagined that the developed model will empower the healthcare providers and program managers to improve the quality of health service and treatment outcomes of patients with drug-resistant tuberculosis.

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