

Assessing The Effect Of Education On Tuberculosis Prevalence

In Sub-Saharan Africa: A Literature Review

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Abstract:

Tuberculosis is a continual concern globally with over 80% of all cases and deaths being reported from low and middle income countries. According to the World Health Organization, tuberculosis is the 13th leading cause of death and the second leading infectious killer after COVID-19. In order to implement effective educational interventions for decreasing the prevalence of tuberculosis, it is crucial to understand how tuberculosis is spread and the stigma behind this disease in Sub-Saharan Africa. Tuberculosis (TB) is a curable and preventable disease caused by bacteria (*Mycobacterium tuberculosis*) that tends to affect the lungs, but can also affect other parts of the body, such as the brain, the kidneys, or the spine (CDC, 2011). Moreover, tuberculosis is spread from person to person through the air, so an individual only has to inhale a few droplets from a cough, sneeze or spit to become infected (WHO, 2022). Although tuberculosis treatment and disease origin is known, stigma continues to be a major factor affecting compliance to treatment among patients in Sub-Saharan Africa and influences their health seeking behaviors. Tuberculosis is viewed as a stigmatizing disease because of its associations with marginalized groups such as the poor, ethnic minorities, low social class, prisoners and refugees, and HIV/AIDS patients (Ashaba, C., *et al.*, 2021). If educational interventions are able to address the stigma behind tuberculosis and effectively elaborate on disease prevention, screening, and treatment that communities would openly reciprocate, then this could aid in decreasing the disease prevalence in low and middle income countries within Sub-Saharan Africa.

Background of Tuberculosis in Sub-Saharan Africa:

The goal of this paper is to review educational tuberculosis interventions within Sub-Saharan Africa or countries of a similar background to provide a guide on the strengths and limitations of such an intervention. Therefore, the following discusses the background of tuberculosis in the region. The World Health Organization (WHO) stated that an estimated 417,000 people died from the disease in the African region in 2016, and another 2.5 million people fell ill with tuberculosis. Before COVID-19 afflicted the world, tuberculosis was a primary health focus, but now researchers have concluded that the pandemic led to a 12 year recession of advancements in finding and treating people with tuberculosis in the region (Olugbosi, M., 2021). Additionally, COVID-19 has also impacted the detection of drug-resistant tuberculosis, with the number of cases recorded in the AFRO region decreasing by 28% in 2020 compared to 2019 (WHO, 2022). According to the CDC, recent models show that unless we scale up efforts to address tuberculosis, especially multidrug resistant tuberculosis, the number of people dying will nearly double every 5 years. Moreover, stigma toward tuberculosis is high in urban populations within Uganda since there is a perception that symptoms of tuberculosis are similar to those of HIV/AIDS, so this has created an additional barrier toward individuals with symptoms from getting screened and treated for the disease (Ashaba, C., *et al.*, 2021). Despite the toll of the disease, governments in Africa contribute only 22% of the resources required to deliver adequate tuberculosis services, while 44% of needs remain unfunded (WHO, 2022). Although WHO has given specific recommendations for low and middle income countries such as those found in Sub-Saharan Africa, there are many barriers to facilitating the uptake of these to decrease disease prevalence in the afflicted regions. This paper will review the barriers currently at play and prior tuberculosis interventions that utilized educational programs as a

means of decreasing tuberculosis prevalence to better guide those developing future educational programs to address such barriers and understand how they can create a more effective intervention for afflicted communities.

Research Question:

This paper will study and review different educational tuberculosis interventions within Uganda, Sub-Saharan Africa, and countries with a similar background. To elaborate, countries of a similar background are those that are low or middle income, have a high tuberculosis prevalence, and carry stigma related to tuberculosis. The goal of this paper will be to outline the strengths and weakness of educational interventions that were successful or not in the countries reviewed in order to provide a potential guide of how to reduce the incidence and prevalence of tuberculosis in Uganda and surrounding countries of Sub-Saharan Africa via disease education.

Materials and Methods:**Search strategy**

To obtain the necessary articles to understand the current situation of tuberculosis in Sub-Saharan Africa, searches were conducted utilizing PubMed, a free research engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. The strategy for finding articles to review was typing in key words and groupings of key words to produce a variety of articles over the topic of interest for this paper. The key words used for the search were the following: tuberculosis, Sub-Saharan Africa, Africa, stigma, stigma among tuberculosis patients, Uganda, education, tuberculosis screening, interaction between tuberculosis and HIV/AIDS, intervention, barriers, tuberculosis prevention, multidrug-resistant tuberculosis, and rural villages. The articles found from these key words and groupings gave an excellent overview of the current situation and prior interventions in the affected regions that were studied.

Criteria for Article Inclusion

For studies or sources to be considered in this review they should be focused on the topics of educational tuberculosis interventions within the target area of Uganda and Sub-Saharan Africa. The target population for this review is children in Uganda and Sub-Saharan Africa, but being that tuberculosis can afflict all age categories they were not excluded due to cultural norms in Africa, with parents and guardians being a potential barrier to screening and treatment services. Sources of any article type were considered as long as they were peer-reviewed and published by a reliable journal. Additional criteria for source selection were studies or sources published after 2004 to the present date.

Study Selection and Data Analysis

With the above-mentioned criteria and guidelines, the search on the PubMed database yielded around 295 results. The article titles were scanned for the keywords and comparisons of educational intervention practices within studies. If the abstract of an article seemed to match the theme for the literature review, the article was analyzed using a literature matrix. After reading each article, they were analyzed by the following categories: purpose, methods, population and age group studied, location, results, conclusions, and gaps or limitations within the reading.

Discussion:**Stigma And Tuberculosis**

According to the Mayo Clinic, stigma is when someone views you in a negative way because you have a distinguishing characteristic or personal trait that's thought to be, or actually is, a disadvantage (a negative stereotype). Despite tuberculosis treatment and origin being known globally, stigma continues to be a major social factor that creates a barrier in decreasing tuberculosis prevalence within many countries in Sub-Saharan Africa. Tuberculosis is often viewed as a stigmatizing disease in this region because of its associations with marginalized groups such as the poor, ethnic minorities, low social class, prisoners and refugees, and HIV/AIDS patients. In a study done in Kampala, Uganda, tuberculosis patients reported the following concerns and fears: subjects of gossip in their community, fear of divorce, slim to no marriage prospects, and not being able to share items within their household (Ashaba, C., *et al.*, 2021). For example, the stigmatization of tuberculosis in Ghana led to the prohibition of tuberculosis infected individuals from selling foods in public markets and attending community events, and it was found that the main cause of stigma in this region was fear of infection (Kelly, S. *et al.*, 2008). Additionally, another study conducted in KwaZulu-Natal, South Africa wanted to validate the presence of tuberculosis stigma by utilizing a tuberculosis stigma scale as a tool to better understand the impact of stigma on care seeking behavior, treatment initiation, and retention in care. When patients at the voluntary HIV testing site were interviewed, they completed a 4-point Likert scale questionnaire made to measure a patient's experienced and felt tuberculosis related stigma, and it was found that persons with high tuberculosis stigma were more likely to be male and have accurate knowledge of the disease (Bajema, K., *et al.*, 2020). Both studies highlight just how broad the stigmatization of tuberculosis can be based on geographic location. Hence, in order to properly create interventions for tuberculosis in Sub-Saharan Africa, understanding the levels of stigma in the targeted region is necessary.

Tuberculosis Education Programs

Africa has made progress in the fight against tuberculosis in recent years, but due to several hurdles such as stigma and the COVID-19 pandemic efforts to eliminate this disease by 2030, per the WHO global target, look less likely to occur (WHO, 2022). However, this does not mean a continual decrease of disease prevalence is not possible. Typical tuberculosis interventions within Sub-Saharan Africa involve either rapid sputum diagnosis or integrating tuberculosis and HIV services within the community (Ayles, H., *et al.*, 2013). Still, there is another method of intervention which can be used that is just as effective as stated in the "stop tuberculosis strategy" by WHO developed in 2006, which is social empowerment via education (WHO, 2008). For example, consider a study done in Vietnam, a country ranked 13th among 22 countries with the highest tuberculosis burden in the world. The study was conducted in 42 districts of northern and central Vietnam that were evaluated for the impact of the nation's tuberculosis health education program, and it was found that of the 364 patients interviewed 93% reported high knowledge of tuberculosis and its treatment after the program. Furthermore, this resulted in significant improvements in tuberculosis control activities, so it was suggested that in order to promote the continual reduction of stigma and tuberculosis prevalence the health education program would continue to be promoted throughout the region (Hoa, N. P., *et al.*, 2004). In a similar manner, another study was conducted in Indonesia, the country with the second highest tuberculosis burden in the world (WHO, 2021). The goal of the study was to explore the knowledge and behaviors related to tuberculosis causation, transmission, prevention,

and early diagnosis within Flores, Indonesia before and after the implementation of the new educational program into the existing tuberculosis program in three intervention villages and compare the results within three similar comparison villages. What was found is that there was limited knowledge and some misunderstanding about tuberculosis across the entire studied population. For instance, only 2 out of 50 participants identified germs as being the cause of tuberculosis, and nearly one third of those interviewed believed the disease was inherited due to magic and an unclean environment. Researchers concluded that limited knowledge and misunderstandings of the disease were due to conventionally focused tuberculosis programs, so the lack of knowledge of symptoms of the disease appeared to influence health seeking behavior; in addition, the program resulted in positive changes in relation to disease knowledge and awareness along with early case detection (Dewi, C., 2016). To say, both examples highlighted how continued mentoring and support of educational interventions led to an improvement of tuberculosis knowledge and awareness within afflicted communities that in turn created a shift in behavior changes for the better.

Conclusion:

Tuberculosis remains an important health problem globally and poses complex problems medically, socially, economically, and culturally (WHO, 2021). This disease is the ninth leading cause of death worldwide and the first leading cause from a single infectious agent (African Union, 2020). Furthermore, all age groups are at risk for tuberculosis, and those who are infected with HIV are 20 to 30 times more likely to develop active tuberculosis (WHO, 2022). Despite the fact that globally tuberculosis incidence is falling at about 2% each year, over 25% of tuberculosis deaths continue to occur in the African region. This is due to barriers such as disease stigma, COVID-19 pandemic, and the rise of drug-resistant tuberculosis in the region (WHO, 2022). Moreover, typical tuberculosis interventions in Sub-Saharan Africa involve either rapid sputum diagnosis or integrating tuberculosis and HIV services within the community (Ayles, H., *et al*, 2013). However, other studies have found that educational interventions can be just as impactful, if not more so, in addressing tuberculosis burden and adequately doing so by understanding the perception of the disease in afflicted regions. Overall, there is still much to be done to decrease tuberculosis rates in Sub-Saharan Africa, and although educational interventions have shown promising results, there is still much more research to be conducted in proving that an intervention of this nature can truly impact tuberculosis rates in the region.

Resources:

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