INTERVENTION APPROACHES OF STIGMA RELATED TO TUBERCULOSIS IN DEVELOPING COUNTRIES: A SYSTEMATIC REVIEW

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ABSTRACT

Considerable efforts and concurrent studies have been made to substantiate the control of tuberculosis (TB). The control was not achieved significantly, as the stigma is one of the significant barriers to controlling tuberculosis. It hampers the TB treatment's determined targeted completion. However, despite countless measures to improve therapy completion, non-adherence to therapy remains a global issue. This systematic review is aimed at evaluating tuberculosis-related measures to increase adherence to treatment among patients with tuberculosis in developing countries. A systematic search of electronic databases (PubMed, Google Scholar, Pro-Quest science Direct, Ovid, Spring, Global Health, and Cochrane) covering articles published between 2003 and 2019 was carried out using truncated search words such as "tuberculosis-related stigma," TB Stigma," "intervention," "treatment adherence," "treatment compliance" and "developing countries." We included information from developing countries addressing the stigma between TB patients and their anti-stigma intervention. Eight hundred sixty-seven articles have been retrieved, 346 have been excluded due to duplication, and 397 other non-relevant articles have been excluded at the title screening stage. Subsequently, after full-text articles were assessed for failing to meet inclusion criteria, 118 articles were excluded, and only six studies remained. The six articles have improved TB treatment outcomes with stigma intervention, including health education and counseling, TB club self-support, and psychological support interventions. Setting, resources and local TB epidemiology may vary in the optimal implementation of stigma interventions.

Keywords: Stigma; tuberculosis; anti-stigma intervention; treatment adherence; developing countries.

INTRODUCTION

With 16% of patients dying from it, tuberculosis (TB) is one of the top ten causes of death and the leading cause of a single infectious agent, which is among one of the health targets of the sustainable development goals by WHO[1]. Tuberculosis is a serious public health problem in developing countries where it is exacerbated by other factors that stigmatization is highly prominent in it[2]. Stigma, defined as a negative attitude held by members of the public[3], is a barrier to access to tuberculosis management and recovery [4]. It also results in the sense of disgrace or guilt, leading to self-isolation as TB-infected persons internalize their community's negative judgments about the disease[5]. Hence, it is crucial in the attempt to eradicate TB-related health issues through the improvement of treatment adherence, i.e., the "extent to which a person's behavior is taking medication, following a diet, and executing lifestyle changes, corresponds with agreed recommendations from a health care provider" as defined by World Health Organisation (WHO)[6]. Knowledge of the adherence response relationship in the treatment of TB will provide us with the basic knowledge that helps in patient monitoring and counseling to develop adherence-promoting interventions[7]. Developing countries increasingly need to implement addressing and awareness of the community and patients regarding TB-related stigma while simultaneously improving adherence to TB medications[8]. Adherence to TB treatment is critical to achieving this goal, and stigma can be reversed with clear interventions[9]. To understand the effectiveness of intervention programs, this study is carried out to systematically review stigma-related TB interventions that improve treatment adherence in developing countries.

MATERIALS

Cochrane guideline is followed, including the search strategy and method of identifying and evaluating the effect of stigma-related TB intervention to improve treatment adherence among adults in developing countries. A systematic electronic search was undertaken for the under-consideration titles, abstracts, and keywords in the journal databases of PubMed, Google Scholar, ProQuest, global health, Science

Direct, Ovid, Spring, and Cochrane Database in March 2019; truncated keywords and terms entered were A) "*Stigma-related TB*" OR "*TB Stigma*" OR "*Tuberculosis stigma*"; AND B) "*Intervention*"; AND C) "*Treatment Adherence*" OR "*Treatment compliance*"; AND D) "*Developing Countries*." Two independent authors completed the literature screening separately. Titles and abstracts of the studies were screened using the keywords. The study selection was primary search and the primary or basic investigation advance search. The reviewers identified the articles using abstracts, while advanced search used the whole paper applying the inclusion and exclusion criteria to evaluate the eligibility.

The inclusion criteria were any form of community interventional study, articles from 2003 to 2019, original articles, and English language. The full text was assessed for eligibility. Exclusion criteria included case reports, case series, reviews, laboratory studies, convenience, purposive sampling, and inaccessible full-text articles. Synthesis was synchronized by stigma-related TB intervention and adherence to the form of therapeutic intervention, i.e., actual intervention behavior such as TB stigma and adherence to directly observed therapy (DOT). Data were extracted by following the form or model and guidelines provided by Cochrane Collaboration. Each included study was independently reviewed by one of the reviewers. An adapted version of the Cambridge Quality Checklist has been used to assess the included research quality based on statistical strength, measurement reliability, demographic participation, and credibility of causal inferences (i.e., whether the information is prospective, outcome changes are analyzed, and hypothetical / control is used)[10]. Figure 1 displays the article selection process, and six studies were included from Nigeria, Taiwan, South Africa, Nicaragua, and Ethiopia.
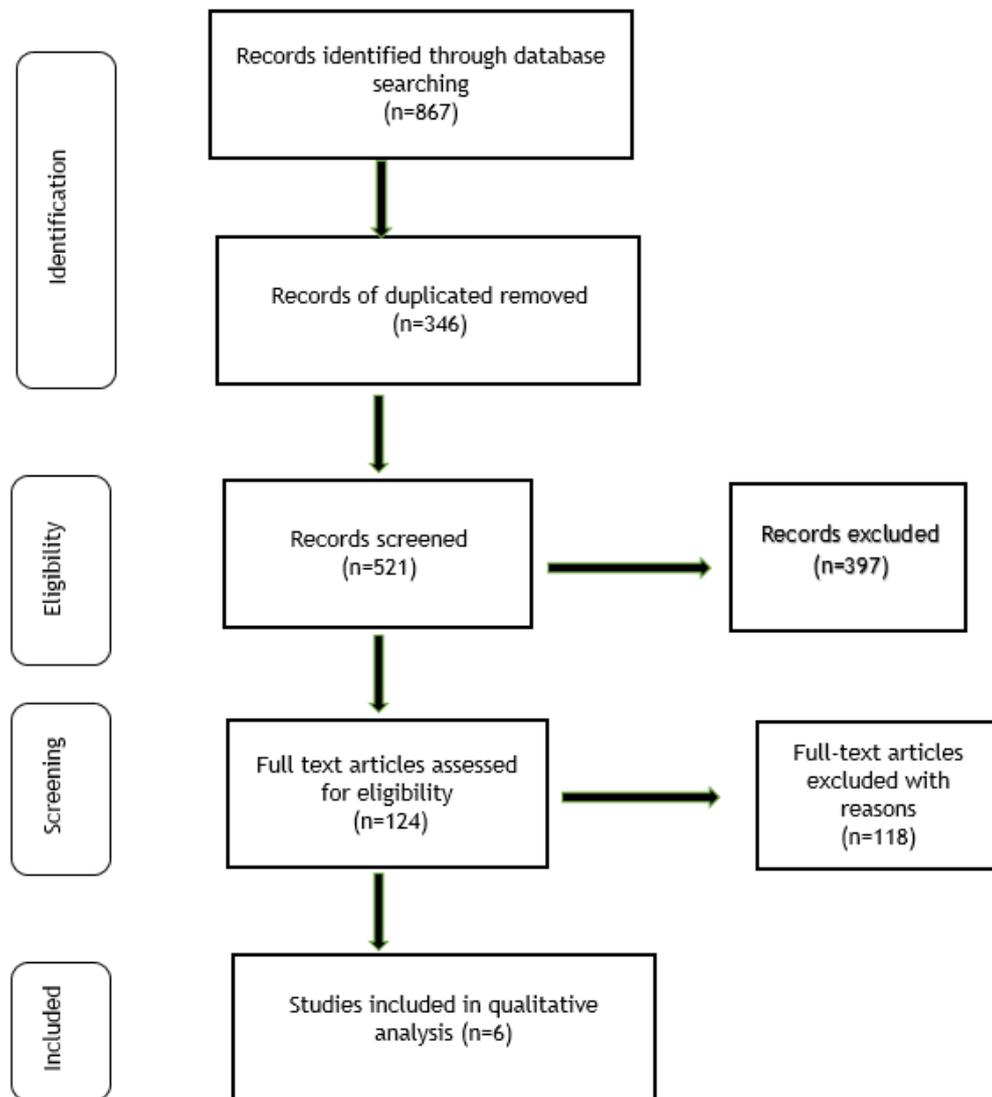

Figure 1: Flowchart of Articles Selection

RESULTS

The findings of each study are summarized in Table 1 (Appendix 1). The stigma connected to the disease is a significant obstacle to achieving targeted global TB control programs. Patient delay causes infection to spread in the community, and perceived stigma can delay sputum tests in time[11]. Additionally, perceived stigma is one of the main factors influencing TB treatment adherence[12]. The social stigma was the primary cause of noncompliance[13] in Somalia, where TB patients experienced the stigma and social isolation. The stigma surrounding TB has led to the social isolation of individuals with the disease [14]. The adverse effects of TB stigma on occupational health care unit use among healthcare workers can affect their well-being[15] and increase hospital costs. Demarcated the primary drivers of fear-based stigma are lack of knowledge regarding routes of infection and perceived contagiousness; however, among persons with good TB knowledge, the perceived risk of infectious diseases and the stigmatization of TB patients[5]. However, Thiametal found that patient counselling, communication, therapy decentralization, patient selection of DOT supporters, and strengthening of supervisory operations improved patient results compared to the standard TB control processes[16].

Intervention to reduce stigma

Wu et al. conducted workshop training in TB control; the workshop included education on TB and the skills required to reduce stigma and improve human rights[17]. The intervention also provided training skills to the caregivers. All study participants made a statistically significant improvement in their level of TB knowledge. There was a reduction in stigmatization scores in general, which was statistically significant in women, public health workers, 40–49-year-olds, those with an education level < 12 years, those who had been a volunteer, and those with a history of TB and those who did not. Self-stigmatization was eliminated effectively by the training workshop. Better understanding leads to improved treatment regimens, adherence, functioning, and well-being of people with TB[17]. Balogun et al. intervention was community- and control groups (19.6%) during enrolment. Based on health education intervention, community volunteers were trained to sensitize the community on TB care and detect cases[18]. The training includes TB information. Their knowledge of TB increased from 16.9 ± 5.1 to 24.6 ± 3.7 at the post-test evaluation. The mean knowledge score of the respondents increased from 10.6 ± 7.0 at baseline to 16 ± 5.4 post-intervention ($p <$ 0.001). There was also a 20.3% increase in respondents with a positive attitude and a significant increase in mean attitude score ($p <$ 0.001). Health workers' TB knowledge improved, and stigma was eliminated after a training workshop[18]. Macq et al. conducted intervention by strengthening patients through TB clubs, taking the form of self-help groups, home visits, and case discussions centered on the problems experienced by TB patients, as well as the provisions of DOT[19]. A psychologist organized training on self-esteem in each of the municipalities after calculating internalized stigma; one for 15 days of treatment and another for two months of treatment were measured. After 15 days of treatment, scores were equivalent in both intervention and control. After 2 months, the difference between scores was statistically significant, (control=33.1, intervention = 27.4 $p = 0.001$).

Revealing a decreased internalized stigma in the intervention group and not the control group[19]. Sommerland, et al, 2017, revealed that 804 healthcare workers (HCWs) participated in a cluster of randomized controlled trials with the basic data performed in South Africa[20]. His stratified randomized controlled trial cluster lasted 8 months, with screening, diagnosis, and INH preventive therapy being the method of delivery. The result showed a significant negative relationship between the perception of co-worker's stigma and the use of OHUs for TB testing (ß -0.21, p =0.000), Treatment (ß -0.16, p = 0.001), and Isoniazid preventive treatment (ß-0.17, p=0.000). And the impact of stigmatizing attitudes among HCWs is reduced among possible stigma-reducing interventions and TB awareness aspects concerning TB curability [20]. Tola et al. conducted a Randomized Control Trial (RCT) cluster of 698 TB patients in Ethiopia[9].

The intervention components were psychological counselling and Health education on tuberculosis (TB) medication adherence over seven months, with almost the same rate of non-adherence between intervention groups (19.4%) and control groups (19.6%) during enrolment. Nevertheless, after the intervention, the rate of non-adherence in the intervention group decreased from 19.4 (baseline) to 9.5% (endpoint). In comparison, the level of non-adherence in the control group rose from 19.4% (baseline) to 25.4% (endpoint). In addition, the impact of psychological counselling and educational interventions on adherence to TB treatment showed a significant statistical difference between intervention and control at the endpoint of intervention (COR= 0.35, p =0.001) and (AOR= 0.31, p = 0.001). Demissie et al. conducted a cohort study of hybrid quantitative and qualitative approaches in Ethiopia with 128 participants[13]. Did an activity called TB clubs include awareness of TB Knowledge and medication adherence? The study results had: (λ^2 =5.41; p =0.020) 44 out of 64 patients (68.7%) completed treatment in the TB club group, and only 30 out of 64 (46.8%) completed treatment in the comparison group. The default rate was also significantly lower in the TB club group 8/64 (12.5%) compared to 26/64 (40.6%) in the comparison group (λ^2= 11.57; p =0.001). In attitude, the TB club program

significantly impacts patient adherence to anti-TB treatment, creates positive community perceptions and practices on TB, and reduces anticipated stigma in patients with TB and the general community.

DISCUSSIONS

There is significant heterogeneity in terms of intervention approach among the six articles. Nevertheless, those interventions showed an increase in knowledge of the patient, community, and health workers can reduce the stigma, which improves TB treatment adherence, whether DOT or self-management. The strength of this review is its comprehensiveness and novelty. This systematic review has several limitations, such as the shortage of interventions and the use of different outcome measures. This study provides essential information for the communities and policymakers about how stigma reduction can improve TB treatment adherence. Furthermore, studies suggested psychological counselling and health education interventions remarkably reduced the non-adherence stage amongst the intervention group[12]. Additionally, improved patient counselling and communication, decentralization of treatment, patient choice of DOT supporter, and reinforcement of supervision activities led to improved patient outcomes compared with the usual TB control procedures[16]. Toward overcoming barriers, reducing stigma, and improving treatment adherence, they encouraged people within the community and family members[21]. It would be exceptionally effective to encourage and educate the public in all sectors, government policy, and effective training of health workers; this embrace can overcome the stigma related to tuberculosis and advance its cure and eradication[22]. However, this issue of the industry with stigma related to TB to improve treatment is a concern for humanity and the whole world[23]. Furthermore, Tuberculosis treatment is quite complicated as some aspects such as lack of knowledge, access to treatment, social stigma, confidentiality issues, job loss, social support, and length of treatment remain considered barriers to medication adherence[24]. For future evaluations, there is a need for further studies with validated measurement and intervention guidelines for stigma reduction to improve TB adherence.

CONCLUSION

We have found that TB treatment outcomes improve with stigma intervention approaches such as health education and counseling, self-support, psychological support, and TB club interventions. The optimal package of stigma interventions to implement may vary by setting, resources, and the local epidemiology of TB, among other factors. There is a need for more research or studies on stigma reduction that leads to improving TB adherence. The outcome of TB treatment and stigma shown after successful implementation provides initial evidence that patient increases liability to both DOT and self-management TB treatment adherence.

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Appendix 1

Table1: A review of the articles

Author	Study design / Participants	Intervention	Findings
Wu et al., 2009 [17]	• Study Design: Pre/ Post-intervention • Taiwan • Participants: 1279	**Intervention name:** Training workshops in TB control **Duration:** 8months **Method of delivery:** as a workshop **Intervention components:** • Education about TB • Information on the current situation of TB • The skills required for DOTS Implementation, • De-stigmatization and human rights.	**Training workshops in TB control** were practical for promoting knowledge and eliminating stigmatization. • Pair comparison of knowledge scores and pair comparison of stigmatization scores were revealed to be statistically significant • Improvements in level of TB knowledge ($p=$ 0.034, except those who had a history of TB (p =0.331) • Caregivers, including women ($p = 0.012$), • Public health workers ($p = 0.028$). • 40-49-year-old subjects ($p = 0.035$), • Those with an education of <12 years ($p = 0.024$), • Those who had been a volunteer ($p = 0.018$)
Macq et al., 2008 [19]	• Study design: quasi-experimental design • Nicaragua • Participants:268	**Intervention name:** interventions strengthened TB Patients through TB clubs. package to act on TB stigma Duration:5months **Intervention components** • A psychologist organizes training on self-esteem in each of the municipalities. • Patient-centered home visits at TB clubs planned a revised DOT provision	Three types of intervention: • TB clubs, home visits, and plan revised DOT was adequate, although there was no statistically significant difference between the control and intervention groups for socioeconomic variables and TB treatment outcomes • Both groups are able considered to have good results: 90% of the TB patients in the control group and 93% of the ones in the intervention group were either cured or completed their treatment • Only 5/146 (3%) of the patients in the control group and 4/122 (2%) of the patients in the intervention group abandoned their treatment.
Balogun et al., 2016 [18]	• Study design: Pre-post-test • Nigeria. • Participants: 252	**Intervention name:** Community-based interventions **Duration:** (6 months) Intervention Two health education activities as a group plus a discussion • Health education discussion. • Role play included: TB information (cause, signs/ symptoms, transmission, risk factors, and preventive measures) • Educational pamphlets • Band and songs on TB and had health talks with groups along the way. • Notebook records and video recordings.	• **TB knowledge:** improved significantly • **Attitudes:** improved significantly of respondents. • The intervention significantly increased the mean knowledge score to 16 ± 5.4 ($p < 0.001$) and the mean attitude score to 7.0 ± 1.8 ($p < 0.001$); No statistically significant difference in the mean practice score.
Sommerland al, 2017 [20]	• Study design: Cluster randomized controlled trials • South Africa • Participants: 804	**Intervention name:** Stratified cluster of randomized controlled trials **Duration:** 8months **Method of delivery:** by screening, treatment, and INH preventive therapy **Intervention components:** • TB screening. • Tuberculosis treatment. • Isoniazid preventive therapy.	A significant negative relationship between the perception of stigmatizing attitudes and behaviors among co-workers and the use of OHUs for: • TB screening (ß -0.21, p=0.000), • Treatment (ß -0.16, p= 0.001). • Isoniazid preventive therapy (ß - 0.17, p=0.000). • The effect of stigmatizing attitudes among HCWs is reduced in addition to the TB knowledge component regarding TB curability among potential stigma-reducing interventions.

| Tola et al., 2016[12] | • Study design: Cluster Randomized Control Trial
• Ethiopia
• Participants: 698 | **Intervention name:** A cluster Randomized Control Trial (RCT)
Duration: 7months
Intervention components: Psychological counseling and educational intervention on TB treatment adherence. | • At enrolment, the level of non-adherence among intervention (19.4%) and control (19.6%) groups were almost the same.
• After the intervention, the non-adherence level decreased. Among intervention group from 19.4 (at baseline) to 9.5% (at endpoint), while it increased among control group from 19.4% (baseline) to 25.4%(endpoint).
• The effect of psychological counseling and educational interventions on TB treatment adherence revealed a statistically significant difference between the intervention and control at the endpoint of intervention (COR= 0.35, p=0.001) and (AOR= 0.31, p= 0.001). |
| Demissie et al., 2003 [13] | • Study Design: Combination of Quantitative and qualitative methods
• Ethiopia
• Participants: 128 | **Intervention name:** Intervention TB clubs
Duration: 6 months
Method of delivery: Intervention
Intervention components: The TB club approach has significantly impacted patients' compliance and the community's negative attitude and practices towardsTB. It is not as shocking as before to receive a diagnosis of TB.
TB clubs' interventions included:
• Understanding TB Information
• TB treatment compliance.
• TB misconceptions and wrong beliefs. | • **The treatment completion rate** was significantly better (chi-square, λ^2 =5.41; p=0.02) in the TB club group; 44 out of 64 patients (68.7%) completed treatment in the TB club,while only 30 of the 64 (46.8%) completed treatment in the comparison group.
• **The defaulter rate** was also significantly lower (chi square λ^2 = 11.57; p=0.001) in the TB club group 8/64 (12.5%) compared to 26/64 (40.6%) in the comparison group.
• **Attitudes:** the TB club approach significantly improves patients' compliance to anti-TB treatment and builds positive attitudes and practices in the community regarding TB.
• Reduction in anticipated stigma among TB patients and the general community. |