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Effectiveness of Stigma-Reduction Interventions on Enhancing Basic Tuberculosis Knowledge and Treatment Adherence among TB Patients in Northwestern Region of Somalia: A Randomized Controlled Trial (RCT)

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Abstract

Introduction: Mycobacterium tuberculosis is a type of bacteria that predominantly affects the lungs. In Somalia, TB ranks as a leading cause of death and imposes a significant illness burden. The country's history and culture with tuberculosis have intertwined to an extent where TB and the stigmatization surrounding it are virtually inseparable. This stigma remains a significant barrier to the global eradication of tuberculosis (TB) and hampers TB control and treatment adherence. Both TB knowledge and adherence to its treatment are critical factors when addressing tuberculosis and related issues.

Objectives: To develop, implement, and evaluate the effectiveness of a self-stigma intervention to enhance basic TB knowledge and treatment adherence among TB patients in the Northwest region of Somalia.

Methods: A randomized controlled trial (RCT) was conducted on chronologically selected TB patients treated at the Hargeisa Referral TB Hospital. Participants were split into two groups: intervention and control. The study spanned from February to July 2020. Data on basic TB knowledge and treatment adherence were collected using self-administered validated questionnaires. This data was analyzed using SPSS version 28 with repeated measures ANOVA. The intervention involved a video-based module aimed at reducing stigma, accompanied by lecture programs to bolster basic TB knowledge and treatment adherence. Adjustments were made based on feedback, with rapid follow-ups at two months and again at six months post-intervention. The control group, in contrast, only received standard tuberculosis treatment.

Results: There were significant changes in the improvement of basic TB knowledge and treatment adherence between the two groups. Notably, there was a marked increase in knowledge and adherence among the intervention group across all follow-up periods. Specific statistical details showcasing the differences in mean scores between the groups at various intervals have been provided.

Conclusions: Overall, interventions aimed at reducing stigma were effective in enhancing basic TB knowledge and treatment adherence among patients. This study underscores the importance and efficacy of such interventions in the broader effort to combat tuberculosis.

Keywords: Intervention, Tuberculosis, Basic-TB-knowledge, Treatment-adherence, Northwestern-region-Somalia; Human and Health.

1. Introduction

Tuberculosis (TB) remains a significant public health challenge, especially in low and middle-income countries (LMICs) (Bloom et al., 2017; Foo et al., 2022). This health threat is even more pronounced in areas with limited healthcare infrastructure and resources, such as the Northwest Region of Somalia (Kalan et al., 2018). Beyond the biological implications of the disease, social and cultural factors significantly influence the prevention, treatment, and control of TB (Hargreaves et al., 2011; Rubel & Garro, 1992). TB is a leading cause of death and disease in Somalia (Ali et al., 2017). According to the 2021 Global TB Report, there was a slight increase in the estimated TB incidence in Somalia, rising from 258 per 100,000 people in 2018 to 259 per 100,000 in 2020. However, the death rate remained stable at 68 per 100,000 (WHO, 2022). Enhancing patient knowledge about TB is a crucial component of TB control measures, as it can promote infection prevention and treatment adherence (Huddart et al., 2018). Addressing TB misconceptions requires broad public health initiatives, better access to accurate knowledge, improved healthcare infrastructure, and collaboration between healthcare professionals and the general public. By promoting awareness and knowledge, we can challenge myths and contribute to more effective TB prevention, diagnosis, and treatment efforts (Farhanah et al., 2016; Main et al., 2022).

Poor adherence to TB treatment increases the risk of delayed culture conversion, community transmission, treatment failure, relapse, and the emergence and amplification of drug resistance (Alipanah et al., 2018; WHO, 2019). A significant obstacle in addressing TB effectively is the stigma surrounding the disease (Chen et al., 2021; Courtwright & Turner, 2010). Such stigma can hinder early detection, compromise treatment adherence, and adversely affect patient outcomes (Du et al., 2020). Furthermore, this stigmatization can lead to delayed diagnoses, non-adherence to treatment, and social isolation for individuals diagnosed with TB (Alipanah et al., 2018; Cremers et al., 2015; WHO, 2019). Efforts to mitigate this issue have led to the implementation of evidence-based stigma reduction programs (Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions, 2009; McHugh & Barlow, 2012). In Somalia, the cultural history with TB is so intertwined that the disease and its associated stigmatization are often viewed synonymously (Gerrish et al., 2012).

Intervention self-stigma and TB-associated Health Belief Model (HBM) significantly contributed to stigma reduction, improved knowledge, and heightened treatment adherence in tuberculosis patients. For instance, Bisallah et al. (2018) conducted a parallel two-group RCT study. They examined an educational intervention focusing on knowledge, attitude, and practice, which substantially improved knowledge and attitude by the study's conclusion. Furthermore, studies spanning from 2015 to 2022, such as those by Swe et al. (2016) and Lewis-Smith et al. (2022), bolstered these findings. The former study emphasized the marked increase in respondents' knowledge post-intervention, while the latter highlighted the intervention's acceptability and effectiveness. Meanwhile, other investigations also spotlighted the impact of psycho-education. Maideen et al. (2016) found it beneficial in boosting participants' psychological well-being. Goni et al. (2021) reported that their intervention arm participants scored significantly higher on knowledge, attitude, and practice metrics when compared to the control group, underscoring the intervention's efficacy. Puchalski Ritchie et al. (2016) pointed to how lay health workers' knowledge intervention notably improved tuberculosis care outcomes.

Adding another layer of insight, Efendi et al. (2022) and Hassan et al. (2017) detailed the intervention's role in enhancing patient knowledge, reducing stigma, and elevating treatment success. Similarly, Collin et al. (2019) unearthed evidence-based interventions, like BCG vaccination and LTBI treatment, that directly impacted TB incidence reduction. Khan et al. (2023) introduced patient-centered care interventions that considerably bettered TB patients' health-related quality of life. Their study was aligned with Boutilier et al. (2022), who emphasized how digital adherence technologies bolstered outcomes for high-risk patients. Stigma remains a poignant challenge in tuberculosis care. Nuttall et al. (2022) conveyed that TB patients might endure various stigmatization forms, from internalized to anticipated. Courtwright and Turner (2010) highlighted the complexity of TB stigma, connecting it to HIV, socioeconomic class, and even gender dynamics. Addressing such nuances, Bao et al. (2022) showcased how mHealth interventions, grounded in the ITHBC model, enhanced patients' self-care and compliance behaviors.

The comparative analysis of baseline TB knowledge across different studies and regions paints an intriguing picture. For example, Tola et al. (2015) and Bisallah et al. (2018) found TB knowledge levels at 35% and 54.4%, respectively. Yet, Mbuthia et al. (2020) reported a 68% poor knowledge rate among respondents in Kenya. These disparities underline the complexity and variability of TB knowledge across different contexts. Recent research by Ridho et al. (2022) and Ritchie et al. (2020) underlined the promise of digital health technology in addressing medication adherence and optimizing treatment outcomes. Furthermore, studies by Alipanah et al. (2018) and Faraade et al. (2022) spotlighted adherence strategies, from patient education to psychological support, that significantly enhanced TB treatment outcomes. In sum, the evolving tapestry of research on tuberculosis knowledge, stigma, and treatment adherence offers both challenges and hope. While the burden of stigma and misinformation remains, evidence-based interventions, especially those harnessing digital advancements, are making strides in transforming TB care.

2. Objectives

The stigma surrounding TB poses a severe challenge to eradicating the disease, both in Somalia and globally (Courtwright & Turner, 2010; Gerrish et al., 2012). Such stigma not only hinders the completion of treatment regimens but also contributes to delayed diagnoses and non-compliance due to a lack of fundamental TB knowledge within the community (Tachfouti et al., 2012; Tola et al., 2015). Understanding the effects of stigma-reducing interventions on TB awareness and adherence is essential to formulate targeted strategies (Courtwright & Turner, 2010; Nuttall et al., 2022). Knowledge about TB and adherence to its treatment are foundational when addressing the disease and its associated concerns (Adisa et al., 2021; Munro et al., 2007; Tachfouti et al., 2012; Vernon et al., 2019). Recognizing the ramifications of inadequate TB knowledge in various societies globally also underscores the consequences of non-adherence to TB treatments (Gebreweld et al., 2018; Kulkarni et al., 2013).

This randomized controlled trial (RCT) aimed to evaluate the effectiveness of a stigma-reduction intervention in bolstering basic TB knowledge and improving treatment adherence among TB patients in Northwest Somalia.

3. Methods

Study Design and Setting

A single-centre randomized controlled trial (RCT) was conducted at Hargeisa Referral TB Hospital, the most comprehensive public TB referral hospital in Maroodi-jeex, Hargeisa, Somalia, from February to July 2020.

Participant Selection and Randomization

Patients were chronologically and randomly selected, prioritizing four main factors (Vinodhkumar et al., 2020): a) eligibility; b) selection criteria; c) consent; and d) inclusion and exclusion criteria. The inclusion criteria were set for newly diagnosed TB patients and those who had started anti-TB treatment for at least two weeks, aged 18 years and above. Exclusions were made for TB patients with psychiatric disorders (e.g., schizophrenia) and those mentally unstable. Exclusion criteria were ascertained from the patient's file. Patients were then consecutively randomized into intervention and control groups, pretested at 0 months, and post-tested at two and six months across both groups.

Study Population

The intervention group comprised 155 pulmonary tuberculosis patients, and the control group had 150, making a total of 305 patients. These were sequentially selected using simple random sampling with allocation concealment.

Intervention Details

The HBM theory-based self-stigma reduction intervention program contained four intervention modules: (1) Basic tuberculosis knowledge; (2) Treatment adherence; (3); Community and patient TB stigma; and (4) Myths and misconceptions about tuberculosis. These modules were delivered through PowerPoint presentations, video lectures, and counseling. Five research facilitators (2 males and 3 females) were chosen from the hospital's TB

staff. These facilitators, who were involved in TB control programs, underwent two weeks of training in the self-stigma reduction intervention program. The training aimed to enhance basic TB knowledge and treatment adherence among TB patients. A refresher training was held a day before the intervention.

Data Collection

A self-administered, validated questionnaire was employed. This questionnaire was divided into two main parts: (1) Tuberculosis basic knowledge (Bisallah et al., 2018; WHO, 2008); (2) Treatment adherence (Thompson et al., 2000). Baseline data were gathered prior to the randomization. The questionnaire, originally in English, was translated into Somali for the benefit of respondents who were illiterate. The questions were read out in Somali and responses were recorded as per the participants' choices. The questionnaire's first section contained 12 questions about sociodemographic variables.

Reliability and Pre-testing

A reliability assessment was conducted using Cronbach's alpha reliability analysis for internal consistency. Sections of the basic TB knowledge questionnaires and adherence to TB treatment were pretested among a sample of TB patients in the Hargeisa referral TB Hospital.

Data Analysis

Data were analyzed using SPSS version 28. Descriptive statistics, frequencies, and cross-tabulation were utilized for analyzing sociodemographic factors. A t-test was employed for age since it is a continuous variable. Furthermore, data on basic TB knowledge and adherence to TB treatment were examined using repeated measures ANOVA, considering the effects of group, time, and education on knowledge scores.

Ethical Considerations

Ethical approvals were secured from the University Malaysia Sabah, the Somali federal government's Ministry of Health & human services (MOHHS), the Ministry of Health development (MOHD) at the state level in Somalia, and the Tuberculosis control representative office under the MOHD. Written informed consent was acquired from all participants before the trial began. The intervention was executed, keeping local norms and cultural sensitivities in mind, with consent forms available in both English and Somali.

4. Results

Sociodemographic Profile and Health Habits of TB Patients

Table 1 presents the baseline sociodemographic characteristics of respondents in both the intervention and control groups. At baseline, there was no significant difference between the two groups, except in the category of occupation. Of the 305 respondents in this study, 66.5% were male and 33.5% were female. The mean age was 33.49 years, with the majority, 28 (9.2%), being 18 years old. More than half of the respondents, 165 (54.1%), were married, while 114 (37.4%) were single, and 26 (8.5%) were divorced. Regarding income, the majority earned a monthly income ranging from 1,000,000 to 3,000,000 SLSH (47.2%). The highest reported income was 6,000,000 SLSH (1.6%), while 2.3% had no income. In terms of education, the largest group had completed primary school, 90 (29.5%), followed by those who completed secondary school, 87 (28.5%). Additionally, 71 (23.3%) had no schooling (illiterate), and 57 (18.7%) had pursued tertiary education. Occupationally, the largest segment was unemployed, 78 (25.6%), followed by employees, 68 (22.3%), and business persons, 61 (20%). Notably, 247 (81.0%) of the 305 TB patients resided in the M.Jeex-Hargeisa region, specifically Hargeisa city. Another 28 (9.2%) lived in the eastern provinces, and the majority, 247 (81%), lived within a 0-10 km distance from the TB hospital. In terms of health habits, most respondents, 283 (92.8%), did not use any traditional treatments. Among those who did, 7 (4.6%) used habit soda. Additionally, most respondents, 283 (92.8%), were non-smokers. Among the smokers, 18 (5.9%) smoked 11-20 sticks per day, and 31 (10.2%) had been smoking for a duration of 1-15 years. Overall, there was no significant difference between the intervention and control groups in the sociodemographic factors at baseline.

Table 1. Sociodemographic Factors of Intervention and Control Group Respondents at Baseline

Variable	Intervention group n(%)	Control group n(%)	t.test	χ^2 test	P-value
Age Mean (SD)	34.77(14.207)	32.16(15.67)	1.527	0.445	
Gender			0.07	0.934	
Female	52(33.5%)	51(34.0%)			
Male	103(66.5%)	99(66.0%)			
Marital status			2.162	0.339	
Single	53(34.2%)	61(40.7%)			
Married	86(55.5%)	79(52.6%)			
Divorced	16(10.3%)	10(6.7%)			
Monthly income			2.729	0.256	
<1000,000SLSH	54 (34.8%)	66 (44.0%)			
1000,000-3000,000	78 (50.4%)	66(44.0%)			
>3000,000	23 (14.8%)	18 (12.0%)			
Education			7.043	0.071	
Primary school	45 (29.0%)	45 (30.0%)			
Secondary school	35 (22.5%)	52 (34.7)			
Tertiary school	33 (21.3%)	24 (16.0%)			
No school (illiterate)	42 (27.2%)	29 (19.3%)			
Live by region			8.709	0.33	
E.Provinces	19(12.3%)	9(6.1%)			
Ethiopia	4(2.6%)	8(5.3%)			
M.Jeex-Hargeisa	119(76.7%)	128(85.3%)			
W.Provinces	13(8.4%)	5(3.3%)			
Occupation			33.901	< 0.001	
Student	12(7.7%)	37(24.7%)			
Pastoralists	33(21.3%)	16(10.7%)			
Employee	49(31.6%)	19(12.7%)			
Unemployment	34(21.9%2)	44(29.3%)			
Business Person	27(17.5%)	34(22.6%)			
Distance			6.512	0.089	
0-10KM	118 (76.1%)	129 (86.0%)			
11-20KM	3(1.9%)	0(0.0%)			
21-30KM	2(1.3%)	1(0.7%)			
>30KM	32 (20.7%)	20 (13.3%)			
Do you smoke			0.052	0.820	
No	134 (86.5%)	131 (87.3%)			
Yes	21 (13.5%)	19 (12.7%)			
If yes, how many sticks per day			2.103	0.717	
6-10 sticks/day	5(23.8%)	3(15.8%)			
11-20 sticks/day	10(47.6.%)	8(42.1%)			
21-30 sticks/day	2(9.5%)	5(26.3%)			
>30 sticks per day	4(19.1%)	3(15.8%)			
If yes, how long in years			2.269	0.519	
No Smoke (Nil)	135(87.1%)	131(87.3%)			
1-15 years	17(11.0%)	14(9.4%)			
16-30 years	3(1.9%)	3(2.0%)			
31-45 years	0(0.0%)	2(1.3%)			

Use Traditional Medicine			**0.273**	**0.601**
No	145(93.5)	138(92.0%)		
Yes	10(6.5%)	12(8.0%)		
If yes, kind T.Medic			15.21	0.436
No use (Nill)	145(93.5%)	139(92.7%)		
Habatu sowdaa	4(2.6%)	3(2.0%)		
Flaxseed oil	2(1.3%)	1(0.7%)		
Xulbo	0(0.0%)	3(2.0%)		
Qusulhindi	2(1.3%)	2(1.3%)		
Others	2(1.3%)	2(1.3%)		

Efficacy of Stigma Reduction Intervention on Enhancing TB Knowledge and Treatment Adherence

A Repeated Measures ANOVA was conducted to assess the effectiveness of the stigma reduction intervention in enhancing basic TB knowledge and adherence to TB treatment across various time points. There was a significant main effect of group on both basic TB knowledge and TB treatment adherence scores, $F(1, 305) = 1811.5$, $p < .001$ and $F(1, 305) = 5052$, $p < .001$, respectively. This indicates that the differences between the intervention and control groups were statistically significant. Regarding tests between and within subjects, results revealed a significant main effect of trial times on basic TB knowledge and adherence to TB treatment scores. According to pairwise comparisons in the SPSS output, differences between baseline and end-term, as well as between baseline and six months, were significant. Table 2, Figure 1, and Figure 2 showed that basic TB knowledge and TB treatment adherence scores at baseline, 2 months, and 6 months were significantly higher in the intervention group compared to the control group. At baseline, scores were 3.467 (0.148) for the intervention group versus 3.00 (0.147) for the control group. Two months post-intervention, scores were 13.980 (0.148) for the intervention group versus 2.54 (0.149) for the control group, $F(1, 305) = 1811.5$, $p < .001$. At six months, the scores were 13.980 (0.148) for the intervention group and 2.54 (0.77) for the control group. Furthermore, TB treatment adherence scores at 2 months post-intervention were 9.91 (0.31) for the intervention group versus 2.54 (0.77) for the control group, and at six months, the scores were 9.92 (0.33) for the intervention group versus 2.54 (0.77) for the control group, $F(1, 305) = 5052$, $p < .001$. Overall, the intervention significantly improved basic TB knowledge and TB treatment adherence among TB patients at different time points (baseline, two months post-intervention, and six months post-intervention) compared to the control group.

Table 2. Basic TB knowledge and TB treatment adherence from baseline, 2 and 6 months

Measure time	**$\bar{X}$ (Sd) Intervention group**	**$\bar{X}$ (Sd) control group**	**F test**	**P-value**
Basic TB knowledge Baseline	3.467 (0.148)	3.00 (0.147)	1811.5	< 0.001
Basic TB knowledge 2months	13.980(0.148)	2.54 (0.149)		
Basic TB knowledge 6months	13.980 (0.148)	2.54 (0.149)		
TB treatment adherence Baseline	2.65 (0.98)	2.54 (0.77)	5052	< 0.001
TB treatment adherence 2months	9.91(0.31)	2.54 (0.77)		
TB treatment adherence 6months	9.92(0.33)	2.54 (0.77)		

Figure 1. Basic TB Knowledge from Baseline, 2 Months, and 6 Months

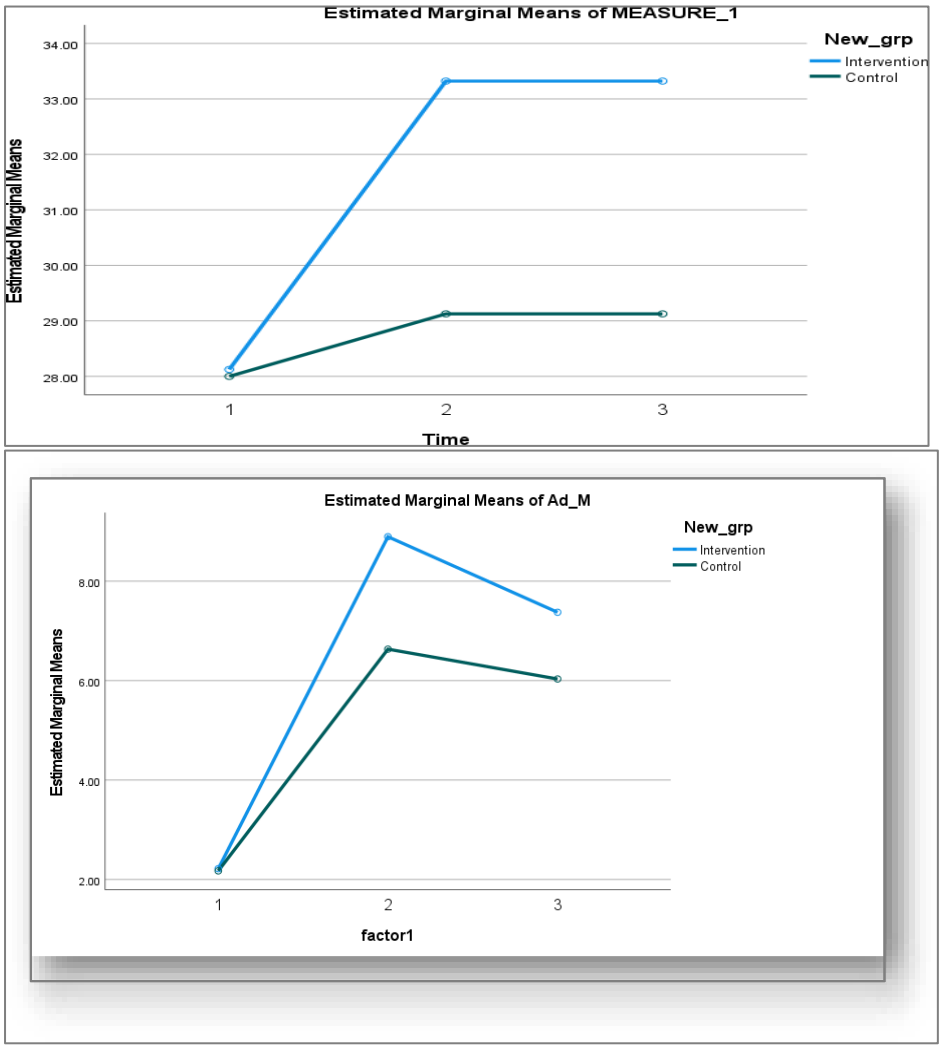

Figure 2. Adherence TB Medication from Baseline, 2, and 6 Months

Effects of Group, Time, Education, and Occupation on Knowledge Scores

The below Table 3 showed as a result of a mixed-design repeated measures ANOVA was performed on group, time, education, and occupation, as well as their interactions with the mean total knowledge scores. Because the sphericity assumption was violated (Mauchly's test p-value <0.001) and the Epsilon was less than 0.75, Greenhouse-Geisser corrected estimates were employed to interpret these findings. There was a significant main effect for the group (F (1,305) = 459.127, $p < 0.001$, partial $\dot{\eta}^2 = 0.658$). Also, there was a significant main effect for time (F (2,305) = 766.903, $p < 0.001$, partial $\dot{\eta}^2 = 0.762$). In addition, there was no significant main effect for education (F (6,305) = 0.183, $p < 0.981$, partial $\dot{\eta}^2 = 0.005$). As well as for occupation (F (7,305) = 1.291, $p < 0.256$, partial $\dot{\eta}^2 = 0.036$). However, there was a significant main effect for group and time interaction (F (1, 305) = 367.659, $p < 0.001$, partial $\dot{\eta}^2 = 0.606$) on the knowledge scores.

Table 3. Effects of Group, Time, Education, and Occupation on Knowledge Scores

Source Variable: Knowledge scores	F	df	Sig.	Partial Eta Squared
Group	459.127	1	0.001	0.658
Time	766.903	2	0.001	0.762

Education	0.183	6	0.981	0.005
Occupation	1.291	7	0.256	0.036
Time*Group	367.659	1	0.001	0.606

Effects of Group, Time, Education, and Occupation on Adherence Scores

Table 4 presents the results of a mixed-design repeated measures ANOVA, which examined the effects of group, time, education, and occupation, as well as their interactions, on the mean total knowledge scores. Given the violation of the sphericity assumption (Mauchly's test $p < .001$) and an Epsilon value less than 0.75, Greenhouse-Geisser corrected estimates were used to interpret the findings. There was a significant main effect of group on the scores, $F(1, 305) = 459.127$, $p < .001$, partial $\dot{\eta}^2 = 0.658$. Additionally, there was a significant main effect of time, $F(2, 305) = 766.903$, $p < .001$, partial $\dot{\eta}^2 = 0.762$. In contrast, the main effects for education, $F(6, 305) = 0.183$, $p = .981$, partial $\dot{\eta}^2 = 0.005$, and occupation, $F(7, 305) = 1.291$, $p = .256$, partial $\dot{\eta}^2 = 0.036$, were not statistically significant. Notably, there was a significant interaction between group and time on the TB treatment adherence scores, $F(1, 305) = 367.659$, $p < .001$, partial $\dot{\eta}^2 = 0.606$.

Table 4. Effects of Group, Time, Education, and Occupation on Adherence Scores

Source Variable: Adherence scores	F	df	Sig.	Partial Eta Squared
Group	459.127	1	0.001	0.658
Time	766.903	2	0.001	0.762
Education	0.183	6	0.981	0.005
Occupation	1.291	7	0.256	0.036
Time*Group	367.659	1	0.001	0.606

5. Discussion

This study demonstrates that interventions aimed at increasing TB-related literacy can significantly improve adherence to TB treatment. This finding aligns with meta-analyses suggesting that education for both patients and healthcare providers should be incorporated as part of an overall TB strategy. Notably, the impact of such educational strategies is superior to that of self-administered methodologies or directly observed treatment alone (Alipanah et al., 2018). Crucially, this study reveals that a patient education model is feasible even in low-income, resource-limited settings. The evidence is unequivocal: paternalistic methods are not as effective as patient-centered care approaches to TB adherence. Such approaches utilize a package of interventions tailored to a patient's needs and values. More empowering models, like education, are seen as promoting autonomy in comparison to less empowering models such as DOTS (Zimmer et al., 2021).

An important aspect that this intervention highlights is the potential of digital health technologies to disseminate TB-related health education. This is especially pertinent in lower middle-income countries where distances are vast, road networks might be inadequate, and specialists or specialized healthcare workers for TB interventions might be concentrated in larger towns. Consequently, digital education models could be the next evolution of this health intervention. They have been proven in gold-standard randomized controlled trials to be efficacious for altering both knowledge and attitudes. While evidence regarding digitally-delivered observed therapies remains inconclusive (Ridho et al., 2022), there exists a research gap in assessing the efficacy of digitally delivered TB patient education modules. Such modules can provide both personalization and two-way communication, facilitating a feedback loop.

These findings potentially resonate with specific health behavior theories, notably the Health Belief Model (HBM) (Yoshitake et al., 2019). This model perceives health behavior change as a logical appraisal of the balance between barriers to, and benefits of, action. The educational approaches utilized in this intervention appear to shift this balance more towards recognizing the benefits of action, while diminishing barriers by rendering them less daunting. Guided by this model, patients attended health education sessions emphasizing the severity of, and susceptibility to, TB. This heightened their perceived threat of TB-related mortality and morbidity, nudging them closer to proactive measures. Conversely, the delivered health education modules accentuated the perceived advantages of adhering to TB medications.

Conclusion, Limitation, and Future Avenues

The principal strength of this study lies in its employment of a gold standard experimental design, specifically the randomized control trial (RCT) methodology. This is complemented by the ample sample size of 305 respondents and a commendably high response rate. However, the study is not without limitations. Patients sourced for this research were exclusively from a primary TB hospital, which operates as a pivotal referral center for TB care and treatment in the region. This specificity could limit the extrapolation of our findings to the broader TB patient population in Somalia. The illiteracy level of some participants further complicates matters. With the necessity for assistance in filling out the questionnaires, there's a possibility that this may have influenced their responses. Additionally, the lurking factor of stigma might have impacted the selection of participants, and the inherent nature of self-reporting could introduce a bias. Another noteworthy limitation is the potentially inadequate follow-up duration, which might not capture the long-term ramifications of the intervention. Furthermore, instances of non-compliance or premature termination of participation could skew the final results. Contamination was a pre-identified concern. Even though separate days were allocated for different study phases, there remained a likelihood of interactions between respondent groups during medication collection and support group sessions.

Despite these constraints, the implications of this RCT for TB prevention in Somalia, as well as other lower-middle-income countries, are profound. A reduction in stigma associated with TB can pave the way for more timely diagnoses, prompt initiation of treatment, and enhanced adherence to therapeutic regimes. Collectively, these factors can lead to superior patient outcomes and diminished TB transmission rates. To sum up, this research enriches evidence-based strategies aimed at augmenting the foundational understanding and treatment adherence of TB patients in Northwest-Region-Somalia. It does so by critically assessing a stigma reduction intervention via an RCT design. For a comprehensive understanding, future research should zoom in on the prolonged effects of the self-stigma mitigation intervention, especially its influence on patients' psychological well-being and adherence patterns post-trial. By doing so, we can bolster fundamental TB knowledge, refine treatment adherence strategies, and ascertain the intervention's enduring feasibility and its cumulative impact on patient welfare. A sustainable blueprint will be essential for ensuring the persistent success of this intervention program. The unwavering commitment of local health professionals, policymakers, and relevant stakeholders will be instrumental in perpetuating the program's efficacy and significance over extended periods.

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Conflict of interest

The authors declare that there is no conflict of interest.

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