Original Article

Outcome Optimization For Patients With Drug-Resistant Tb Via The Implementation Of An All-Inclusive Care Program

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Abstract

OBJECTIVE: The key aspects of a comprehensive treatment plan for people with drug-resistant tuberculosis are described in this research. It also provides helpful insights learned from the deployment process and details how this package was modified and used at University Medical and Dental College, Faisalabad.

METHODS: To evaluate the efficiency of the all-inclusive treatment plan, pilot research including 100 DR-TB patients was carried out. In addition to traditional TB treatment, the package contained several services, including mental support and nutritional aid. Data was gathered using recognized TB techniques and surveillance markers to assess the effect of the intervention. The outcomes were then contrasted with a previous cohort of DR-TB patients who did not get the full range of medical therapy. The goal of this study was to find any variations between the two groups' results, such as treatment completion rates, turnaround times for culture conversion, and fatality rates.

RESULTS: 88% of the 100 patients who got the whole package of care found success with their therapy, a considerable improvement over the prior cohort. 4% of attempts failed, while 7% of patients passed away during therapy. Significantly, just one patient was transported out, and there were no incidents of loss to follow-up. Patients rated financial assistance, free medications, and food assistance as the three most helpful aspects of the care package. The majority of healthcare professionals who took part in the intervention also said that it was doable and sustainable to execute.

CONCLUSIONS: Improving DR-TB outcomes may need a comprehensive plan that includes psychological assistance. Frequent patient contact and better nutrition promote better treatment compliance, and home visits and the development of psychologists' skills may further assist DR-TB patients and ultimately result in their cure.

KEYWORDS: tuberculosis, TB, care program

INTRODUCTION: To end tuberculosis (TB) pandemic by 2030, Target 3.3 of the Sustainable Development Goals (SDGs) (1) calls for a 90% decrease in TB-related mortality and an 80% decrease in TB incidence as compared to 2015. Sadly, the figures continue to be concerning, with over 10 million active TB cases recorded in 2018—80% of which originated in Asian and African nations (2). Between 2020 and 2025, according to the Stop TB Partnership, there will be an extra 6.3 million cases of tuberculosis and 1.4 million fatalities from the illness, making TB one of the worst diseases and causes of death. TB is directly connected to malnutrition, poverty, and overcrowding, aggravating the condition (3).

Poor treatment adherence and late treatment initiation are two major problems for TB programs, which result in drug-resistant TB (DR-TB) and high death rates (4). Drug-resistant TB (DR-TB) poses a greater medical challenge than drug-sensitive TB and jeopardizes worldwide progress toward the World Health Organization's (WHO) End-TB goal (5). Given that DR-TB is responsible for 600,000 fatalities globally and presents a serious threat to both global economic stability and national security (6). The difficulty of DR-TB increases in low- and middle-income countries owing to the need for strong diagnostic facilities with cutting-edge testing and individualization of medications, aspects that are generally lacking in the public sector (7).

With 27,000 DR-TB cases per year that are resistant to first-line TB medications, Pakistan is the fifth-highest burden country for DR-TB (6). According to research done in Pakistan, ofloxacin, a second-line medication, was ineffective in almost half (47%) of patients who had relapse and retreatment due to DR-TB (8). Youth patients between the ages of 10 and 25 are particularly susceptible to developing drug-resistant tuberculosis (DR-TB) (9). While adverse medication responses are not the main barrier to treating drug-resistant tuberculosis (DR-TB), including a psychological component in drug therapy may be advantageous (10).

Global partners of Stop-TB have decided to execute the National Action Plan (NAP) for DR-TB, developed by the USA Government, to battle the pervasive problem of DR-TB (11). The NAP is focused on increasing treatment adherence for all kinds of TB, including multidrug-resistant TB, and avoiding the spread of MDR-TB. By including auxiliary care and psychological support, this is accomplished (12). The NAP's objective is to identify gaps in present TB services and provide strategies to remedy these gaps without affecting the current services (13). Yet, very few researchers have looked at how this approach might be used in regional contexts (14).

In response, the national TB control division of the Common Management Unit (CMU) in Islamabad, with assistance from USAID, launched a modified version of the NAP-based care package. The goal of the research was to evaluate how supportive interventions—including those with a psychological component—affect patients' adherence to therapy and its results. Our research details the methodology and findings of this project, which sought to enhance DR-TB treatment in Pakistan by modifying the TB care system.

METHODS: The research used a combination of quantitative and qualitative methodologies, including measurements. To address the difficulties faced by those with DR-TB, we conducted a thorough review of the relevant literature and held discussions with DR-TB patients, frontline healthcare professionals, TB control managers, and other stakeholders and donors before implementing the supplemental (intervention) component to the current TB care package. The intervention group also got regular economic help, compensation for trip expenses, nutritional and emotional support, and updated health education in addition to the normal treatment.

According to a set of criteria, patients were chosen for the intervention cohort. Initially, patients had to reside in one of the six chosen pilot locations and have either RR- or MDR-TB laboratory verified. Also, rather than merely providing palliative care, their treatment plan must have been intended to find a cure. Ideally, patients who had had therapy for less than 12 months were also taken into consideration for the research. Patients who met the study's exclusion criteria included those who were behind bars at the time. The intervention cohort was then selected among patients who were scheduled to receive at least six months of supportive care package services by July 2022.

We evaluated the intervention component on a sample of 100 patients who were chosen at random after it had been completed. The majority of patients go to the PMDT locations once a month, whereas those who have difficulties are hospitalized. Patients received services from the DR-TB comprehensive care package, and a patient navigator kept track of them in the community.

Data were gathered by administering patient satisfaction questionnaires to each patient in the evaluation (pilot) group as well as to contemporaneous controls who did not receive care. Standard indicators were also acquired from the national TB monitoring system. We contrasted the outcomes between our evaluation (pilot) cohort of patients who got the whole set of supporting services and a prior group of patients who did not. The cost component of the project was computed using the Excel spreadsheets of the financial component while a questionnaire was also sent to the suppliers and managers.

The pilot timeframe was brief, and data were only gathered for the assessment (pilot) cohort of patients' interim treatment results up to this point. These data covered a period of implementation of around six months from August 2022 to January 2023. Patients with proven DR-TB who were diagnosed in 2018 and received treatment in the two pilot sites made up the historical cohort with which we compared our findings. Results from our evaluation (pilot) cohort of patients were compared to those from a prior cohort that had not received all necessary supporting services.

RESULTS: In this prospective trial, 100 intervention group patients and 293 historical cohort patients were tracked (Table 1). Seven patients (2%) from the comparison group dropped out compared to one patient (1%) from the intervention cohort. In the intervention group, a total of 88 patients (88%) were free of DR-TB, as opposed to 216 (74%) in the comparison group. Four patients (4%) in the intervention group and five patients (2%) in the control group had treatment failure. In comparison to the seven fatalities (7%) in the intervention group, 57 deaths (19%) occurred in the historical cohort.

Social and economic aid (93%), free TB second-line medications (74%), and dietary support (57%) ranked as the top three care package services that patients thought were most helpful for treatment adherence. After obtaining psychosocial support services, individuals with DR-TB saw a significant improvement in their mental health.

Table 1: Results of the History and Intervention (pilot) Cohorts' Final Treatment

Treatment status	**Historical Cohort**	**Evaluation Cohort**
	N (%)	N (%)
Transferred	7 (2)	1 (1)
Lost to follow-up	8 (3)	0 (0)
Death	57 (19)	7 (7)
Failure	5 (2)	4 (4)
Success	216 (74)	88 (88)
Total	293 (100)	100 (100)

By the conclusion of the trial, there was an improvement in patient satisfaction with the treatment that was given to them, going from 4% to 93%. (Table 2) The facility's hygiene dissatisfied around one-third of the patients, although the facility's hours, location, and wait times were all well-rated. The patients underwent a psychological evaluation to look for indications of sadness or anxiety. Out of 100 patients, 32 had depression and 27 experienced anxiety in August 2022. The number slowly dropped each month until just 2 patients still had anxiety and 4 still had depression by January 2023.

Table 2: Items in the care package that the patients thought were most beneficial for treatment adherence

Services offered	**Rating by % of participants**
Free drugs and test	6
Psychology	12
Free lab tests	17
Medical staff counseling	46
Nutritional Support	57
Free TB drugs	74
Social-economic help	93

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To get their opinions, a total of 26 health managers and providers were also included in the research. 13 of the staff members said they spent more time in person with patients before they began therapy, 46% said they spent the same amount of time in person with patients, and 4% said they spent less time in person with patients. 17 employees, or 65%, claimed to have increased their time spent on paperwork. The providers offered their opinion of the package's value for patient treatment adherence during the qualitative talks. They claimed that the time and resources required for the care package's execution were appropriate, and a sizable majority of the employees (77%) thought that the care activities could continue in the future with the help of financially sensible methods.

DISCUSSIONS: To improve and maintain adherence to TB treatment, the researchers used a variety of intervention measures, including psychological support, dietary assistance, and the use of a patient-centered approach. Amidst the intervention cohort, there was a mere 4% rate of treatment failure and only one patient had to be transferred out. Remarkably, none of the cases were lost to follow-up. The treatment success rate (TSR) within this cohort stood at a remarkable 88%, surpassing the historical cohort's TSR of 74%. Similar research showed a TSR of 78.4%, a failure rate of 21.6%, and a loss to follow-up rate of 1.2%. (15). According to another research, the TSR was 53.5% and the failure rate was as high as 34.6%. (16). According to the results, the package's adoption in Pakistan's settings led to somewhat improved treatment outcomes.

Programs need to be attentive to this part of the issue since DR-TB may be stressful for patients for a variety of reasons. 32 individuals displayed clinical depression throughout the duration of our investigation, and another 27 had indicators of anxiousness. This indicates that a total of 59 patients (or around 60%) had some kind of psycho-emotional issues. But, over time, their psychological state became better; after 6 months, only 4 patients exhibited clinical depression, and two had anxiety symptoms. It's interesting to note that the patients gave our intervention's psychological component a poor rating. Comparatively, 17% of people considered it useful, whereas 93%, 74%, and 57% of people thought financial aid, free TB medications, and nutritional support were beneficial. This supports the claims made in earlier research that programs must concentrate on the behavioral, social, and structural requirements of the patients and include psychological support as part of the package to improve treatment adherence in DR-TB (14).

Special consideration must be given to the financial aid that ranked higher in our survey. We believe that economic stress significantly contributes to psychological anguish, therefore alleviating the distress requires both economic help and psychological support. Previous research suggested that to achieve universal access to DR-TB therapy, financial risk protection was necessary (17,18). We also believe that giving the patients dietary assistance was beneficial in two ways. Secondly, increasing nutritional status reduces this chance and improves the results of DR-TB since malnutrition makes TB patients more susceptible to all infections (19,20). Also, monthly food assistance enhanced treatment adherence by encouraging patients to routinely report for follow-up care.

The choice of patients for the care package presented some difficulties for the study since it can lead to patient inequality. Real-world challenges included creating open systems for transferring funds to patients receiving financial assistance by government regulations, taking into account the lengthy travel times patients frequently experienced to reach PMDT care facilities, and facilitating community outreach to support the patients in question. The initiative has to deal with cash transfers to provide patients with financial help. At first, this was done using a bank transfer, but because this did not deliver the required level of speed or transparency, a different method had to be created and used. Patients' significant travel lengths to get DR-TB treatment presented another difficulty. To meet the increasing demand for DR-TB treatment, there aren't enough locations in the nation. Also, it greatly raises the cost of care for patients who have to travel long distances, often in dangerous conditions, and remain away from their homes while receiving treatment. Reduced costs and improved patient accessibility will result from the devolution of care to lower tiers of the health system. The initiative struggled with community engagement while attempting to provide more

individualized treatment. Reaching the target demographics required working with local government entities to build connections and provide information.

There are also a few data restrictions to take into account. First off, just two of the highest-quality, most specialized tertiary care centers in the nation used this DR-TB treatment package. As a result, these results could reflect the best-case situations imaginable in the nation, making replication in other care settings challenging and burdensome. The survey populations for patients and healthcare professionals were both modest (100 and 26, respectively), thus not all of the statistics and patterns may be applied nationally.

CONCLUSIONS: An opportunity exists to expand this strategy to Pakistan's whole population due to the remarkable effectiveness of the supportive care package in enhancing DR-TB care for the intervention cohort. To cut down on patient travel time, new PMDT locations must be established. To make supportive services accessible to all DR-TB patients, national and provincial ownership of these interventions is necessary, as is community advocates' participation in the planning stage. The provision of emotional, financial, and nutritional assistance is an essential component of this strategy that gives the human-centered approach to care a practical meaning. It is not unexpected that this complete package had favorable outcomes, and it may be expanded upon to address the nation's low incidence of DR-TB case notification. The fact that TB is mainly a disease of poverty and that sufferers are likely to incur exorbitant medical expenses should not be overlooked. Consequently, it is extremely justified and advised to execute this strategy at scale.

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