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Impact of Treatment Supporters on the Treatment Outcomes of Drug Resistant-Tuberculosis Patients

Ayesha Jamil[1], Nighat Aziz[2], Ikram Zada[3]✉, Ali Ghias Tarar[4], Jawad Hussain Qamber[5], Muhammad Usman Sheikh[6]

[1]Department of Pharmacology, Khyber Girls Medical College, Peshawar - Pakistan [2]Department of Pharmacology, Gomal medical college, Dera Ismail Khan - Pakistan [3]Department of Gastroenterology, F.G Polyclinic Hospital, Islamabad - Pakistan [4]District Head Quarter Hospital, Mandi Bahaudin - Pakistan [5]Department of Physiology, Sahara Medical College, Narowal - Pakistan [6]Department of Community Medicine, Avicenna Medical College, Lahore - Pakistan

Corresponding Author:
Ikram Zada
Department of Gastroenterology
F.G Polyclinic Hospital,
Islamabad - Pakistan
E-mail: tirmazi18@yahoo.com

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A B S T R A C T

Background: Drug-resistant tuberculosis (DR-TB) presents significant challenges to treatment success, necessitating effective support systems.

Objective: To explores the impact of treatment supporters on the outcomes of Drug Resistant Tuberculosis (DR-TB) patients**.**

Methodology: A retrospective cohort study was conducted involving 300 DR-TB patients, categorized by their treatment supporters, i.e. family members, and community health workers. Treatment outcomes, including cure rates, treatment completion, mortality, treatment failure, and lost to follow-up, were analyzed. All data were entered into SPSS for final analysis.

Results: Of 300 treatment supporters, 63.7% were female, mostly aged 31-40. Treatment success was higher (44.3%) with family members as supporters, compared to 4.4% with non-family supporters. Among 265 drug-resistant tuberculosis (DR-TB) patients studied, 62.26% were male, and the most affected age group was 21-40 years (54.72%). Between 2017 and 2021, 41.5% completed treatment, 10.19% were cured, 18.87% died, and 11.7% each faced treatment failure or were lost to follow-up.

Conclusion: This study highlights the critical role of treatment supporters in enhancing adherence and improving recovery rates for DR-TB patients. The results underscore the importance of integrating effective treatment supporter programs into DR-TB management strategies. By optimizing the roles of various treatment supporters and addressing their challenges, healthcare systems can improve treatment success and contribute to broader public health efforts against tuberculosis**.**

Keywords: Pulmonary Diseases; DR-TB; Treatment Supporters

Introduction

Drug-resistant tuberculosis (DR-TB) is a severe form of tuberculosis that does not respond to standard first-line antibiotic treatments, making it a complex and challenging public health issue.[1] It typically develops when antibiotics are misused or not taken as prescribed, leading to the emergence of resistant strains of the bacteria. There are different types of regimens used for treating DR-TB but mostly it requires longer regimens, often lasting 18 to 24 months, using second-line medications that can have significant side effects, complicating patient care.[2] This extended treatment period increases the risk of transmission, as patients may remain contagious for longer. Drug-resistant tuberculosis (DR-TB) is a serious global health issue. Unlike regular tuberculosis, DR-TB does not respond to standard treatments, leading to longer and more complicated treatment plans. This situation increases the risk of illness and death for patients, as well as the chance of spreading the disease to others. According to the World Health Organization, a significant number of new and previously treated TB cases are resistant to medications, highlighting the urgency of effective treatment strategies.[3]

The burden of DR-TB is particularly high in low- and middle-income countries, where healthcare resources are limited. Addressing this issue effectively demands innovative approaches, including robust support systems for patients, to improve treatment adherence and outcomes. Given the challenges of DR-TB treatment, support from others can be crucial.[4] Treatment supporters, who may be family members, friends, or trained community health workers, play an important role in helping patients stick to their treatment plans.[5] They provide emotional support, remind patients to take their medications, and assist with practical matters like attending medical appointments. This support is especially important since many DR-TB patients face stigma and isolation, which can make it hard for them to adhere to their treatment.[6]

Evidence suggests that the presence of treatment supporters can significantly impact treatment adherence, which is crucial for the success of DR-TB therapy.[6-9] Patients often experience stigma, social isolation, and psychological distress, which can hinder their ability to maintain consistent treatment. Treatment supporters can mitigate these issues by providing a support network that encourages patients to stay on track with their medication, attend follow-up appointments, and manage side effects effectively.[6]

Many research has shown that having treatment supporters can lead to better treatment outcomes. Supporters help patients manage the difficulties of treatment, which is vital for achieving successful results. To better understand how treatment supporters influence the care of DR-TB patients, this study uses a retrospective cohort design. This means we will look back at patient records to see how the presence of treatment supporters affects treatment adherence, recovery rates, and overall quality of life.

The goal of this study is to evaluate how treatment supporters impact the outcomes for patients with DR-TB. By examining various factors, including adherence to treatment and health improvements, we hope to highlight the importance of support in managing this challenging disease. Ultimately, integrating treatment supporters into healthcare for DR-TB patients could lead to better treatment success and improved patient experiences. The following sections will outline the study's methods, results, and implications for future care practices.

Objective

To explores the impact of treatment supporters on the outcomes of Drug Resistant Tuberculosis (DR-TB) patients**.**

Methodology

This study employs a retrospective cohort design to evaluate the treatment outcomes of drug-resistant tuberculosis (DR-TB) patients. By reviewing existing medical records, we aim to analyze the impact of various factors, including the presence of treatment supporters, on treatment adherence, clinical outcomes, and quality of life.

This study includes data from Peshawar and Islamabad, focusing on patients who received treatment between September 2017 and December 2021, with a sample size of 265. The specialized centers for DR-TB treatment provided comprehensive care, including access to second-line medications, clinical monitoring, and support services. Exclusion criteria involve patients with comorbid conditions that could independently affect treatment outcomes, those lost to follow-up within the first three months of treatment, and individuals who refused to participate.

Inclusion Criteria involve adults aged 18 years and older. Eligible patients were those who had initiated treatment within this specified timeframe and had complete medical records available for analysis. This careful selection aimed to ensure that the data collected accurately reflected the experiences and outcomes of individuals receiving treatment for DR-TB during the study period.

Data collection involved reviewing medical records and treatment logs maintained at the center. Key information extracted included demographic details such as age, gender, socioeconomic status, and education level. Clinical data included the type of TB strain (e.g., MDR-TB or XDR-TB), baseline health status, and specifics of the treatment regimen. Information regarding the presence of a treatment supporter—defined as a family member,

Table 1. Baseline patient demographics by Age Group and Gender

Age Group	Male (%)	Female (%)	Total Patients	Percentage (%)
18-20 years	35 (13.2)	25 (9.4)	60	22.64
21-40 years	90 (33.9)	55 (20.7)	145	54.72
41-60 years	25 (9.4)	15 (5.6)	40	15.09
61-80 years	35 (13.2)	20 (7.5)	55	20.75
80-85 years	3 (1.1)	2 (0.7)	5	1.89
Total	165	100	265	100

friend, or community health worker providing active assistance—was also gathered, along with the nature of the support offered. Treatment outcomes measured included adherence levels, sputum culture conversion rates assessed at 2, 6, and 12 months post-treatment initiation, treatment completion rates defined as patients who completed the prescribed regimen, and health-related quality of life (HRQoL) assessed using validated questionnaires administered at baseline and at the end of treatment.

Data analysis was conducted using statistical software, beginning with descriptive statistics to summarize demographic and clinical characteristics, including means, medians, and percentages. Comparative analyses were performed using chi-square tests for categorical variables, such as treatment completion rates and adherence levels between groups.

Ethical considerations were very important in this study. It received approval from the institutional review board (IRB) at the treatment center. To protect patient confidentiality, all data was anonymized. Because the study was retrospective and used only existing medical records.

Result

A total of 265 patients with drug-resistant tuberculosis (DR-TB) were studied. Among them, 165 (62.26%) were males and 100 (37.74%) were females (Figure 1).

The ages of the patients ranged from 18 to 85 years. The most affected age group was 21-40 years, comprising 145 patients (54.72%), followed by the 18-20 years group with 60 patients (22.64%). The age group of 80-85 years had the fewest patients, with only 5 individuals (1.89%) represented (Table 1).

Table 2 shows that from 2017 to 2021, 265 patients with drug-resistant tuberculosis (DR-TB) were studied, resulting in 110 (41.5) and 27 treatment completions (10.19%). A total of 50 patients (18.87%) died, while 31

Table 2. Treatment Outcomes of DR-TB Patients

Year	Total Number (n)	Cured (n, %)	Treatment Completed (n, %)	Died (n, %)	Treatment Failed (n, %)	Lost to Follow-Up (n, %)	Transferred Out (n, %)
2017	51	20 (39.22)	4 (7.84)	11 (21.57)	3 (5.88)	10 (19.61)	3 (5.88)
2018	56	25 (44.6)	5 (8.9)	12 (21. 1)	3 (5. 3)	6 (10. 7)	5 (8.9)
2019	54	20 (37.04)	6 (11.11)	10 (18.52)	9 (16.67)	6 (11.11)	3 (5.56)
2020	52	19 (36.54)	8 (15.38)	8 (15.38)	10 (19.23)	4 (7.69)	3 (5.77)
2021	52	26 (50.0)	4 (7.84)	9 (17.65)	6 (11.76)	5 (9.80)	2 (3.92)
Total	265	110 (41.5)	27 (10.19)	50 (18.87)	31 (11.70)	31 (11.70)	16 (6.03)

Table 3. Baseline characteristics of treatment supporters 300

Variables	Family Member n (%)	Community Health Worker n (%)	Total (%)
Gender			
Male	87 (32.5)	22 (66.7)	109 (36.3)
Female	180 (67.5)	11 (33.3)	191 (63.7)
Total	267	33	
Age			
18-30	42 (15.7)	14 (42.4)	56 (18.6)
31-40	129 (48.4)	17 (51.5)	147 (49.0)
>40	96 (35.9)	2 (6.06)	97 (32.3)
Total	267	33	

faced treatment failure, and 31 were lost to follow-up.

In this study 300 treatment supporter for drug-resistant tuberculosis (DR-TB) patients included. Of these, 109 were males and 191 females, with community health workers constituting a small proportion (33). The age distribution shows that the majority of supporters were between 31 and 40 years old, with significant representation from the Family members group, particularly among younger supporters (Table 3).

Table 4 presents the treatment outcomes for drug-resistant tuberculosis (DR-TB) patients according to the type of treatment supporter. Results indicate that successful treatment outcomes were significantly higher (44.3%) among patients with a family member as their treatment supporter, whereas this rate was considerably lower (4.4%) when supported by non-family members.

Discussion

The impact of treatment supporters on the treatment outcomes of drug-resistant tuberculosis (DR-TB) patients is a crucial area of focus in public health. DR-TB represents a significant challenge globally, necessitating effective strategies to ensure treatment adherence and improve patient outcomes. Treatment supporters, including community health workers and family members, play a vital role in this process. Their involvement often leads to enhanced adherence rates, which are essential for the successful management of DR-TB, a condition that requires prolonged treatment regimens lasting from

Table 4. Effect of treatment supporter on final treatment outcome of the patients

Category	Family Member n (%)	Community Health Worker n (%)	Statistical Indicator
Cured	86 (28.6)	8 (2.7)	$\chi^2 = 6.5$, df = 2, p = 0.038
Treatment Completed	47 (15.7)	5 (1.7)	$\chi^2 = 4.2$, df = 2, p = 0.12
Died	42 (14.0)	5 (1.7)	$\chi^2 = 7.5$, df = 2, p = 0.024
Treatment Failed	39 (13.0)	4 (1.3)	$\chi^2 = 3.8$, df = 2, p = 0.15
Loss to follow up	35 (11.7)	6 (2.0)	$\chi^2 = 1.5$, df = 2, p = 0.47
Transferred Out	18 (6.0)	5 (1.7)	$\chi^2 = 0.8$, df = 2, p = 0.67

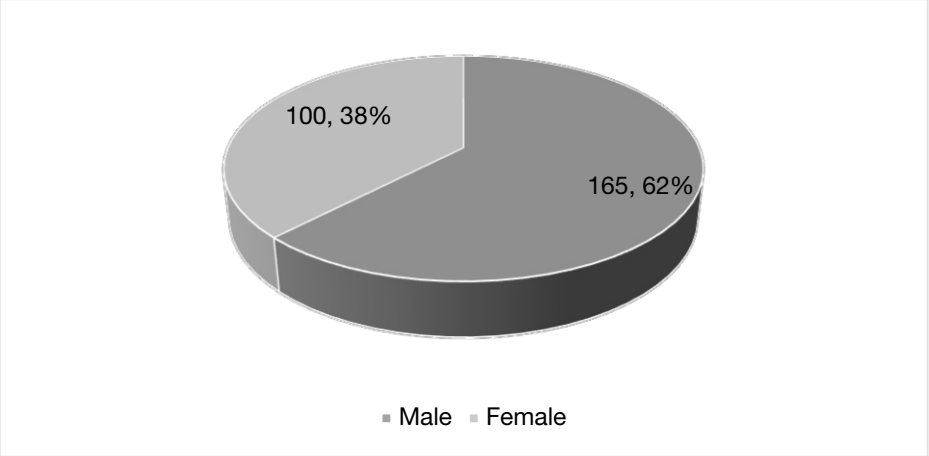

Figure 1. Distribution of study cases on base of gender

six months to two years.[10]

In the present study, it was reported that the Family members group demonstrated the highest successful rate at 44.3%, as compared with non family members (4.4%). Other research has also demonstrated that treatment supporters can significantly improve adherence. For instance, a study found that adherence rates among DR-TB patients with a treatment supporter were 83%, compared to 64% in those without.[11] Another study from India also stated that adherence rate with treatment was highly link with treatment support relation with the patients.[12] This increase in adherence directly correlates with better treatment outcomes. A retrospective cohort study conducted in South Africa reported that DR-TB patients with active treatment supporters achieved treatment success at a rate of 75%, while only 45% of those without support reached similar outcomes.[13] This underscores the pivotal role of treatment supporters in overcoming barriers such as stigma and side effects associated with treatment.

Moreover, treatment supporters facilitate access to healthcare services, which is crucial for timely interventions. A study in Bangladesh indicated that patients with treatment supporters were 1.5 times more likely to attend follow-up appointments compared to those without.[14] This increased access is vital for monitoring and addressing potential complications during treatment.

The psychosocial support provided by treatment supporters also cannot be overlooked. Many DR-TB patients experience social isolation and mental health challenges due to their condition. Support from family members and community health workers often helps alleviate feelings of anxiety and depression. A qualitative study in Nigeria highlighted those patients with supportive family members felt more motivated and less isolated, positively influencing their adherence to treatment.[15]

Despite the evident benefits, challenges remain in the implementation of treatment supporter programs. Not all patients have access to effective support, and the quality of support can vary significantly. In some cases, family members may lack the necessary knowledge or skills to provide adequate support. Cultural factors may also influence patients' willingness to accept help, which can impact the effectiveness of these programs. Furthermore, the sustainability of treatment supporter programs is crucial; funding and training resources are often limited, hindering the development and retention of effective treatment supporters.

Overall, the evidence strongly supports the notion that treatment supporters significantly improve the treatment outcomes of DR-TB patients. Their role in enhancing adherence, providing emotional support, and facilitating healthcare access is vital in managing this complex disease. However, addressing the challenges associated with treatment supporter programs is essential to maximize their effectiveness and ensure their sustainability.

Conclusion

In conclusion, this retrospective cohort study highlights the significant impact of treatment supporters on the outcomes of drug-resistant tuberculosis (DR-TB) patients. The findings reveal that Family supporter, in particular, are associated with higher cure rates compared to family members and community health workers, emphasizing their crucial role in enhancing treatment adherence and patient engagement. Additionally, the statistical analysis indicates meaningful differences in outcomes, particularly in the cured and died categories, suggesting that the type of support provided can influence patient recovery. These results underscore the importance of integrating effective treatment supporter programs into DR-TB management strategies.

By optimizing the roles of various treatment supporters and addressing the challenges they face, healthcare systems can improve adherence rates and ultimately enhance treatment success for DR-TB patients. This approach not only benefits individual patients but also contributes to broader public health goals in the fight against tuberculosis.

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