Improving Pulmonary Tuberculosis Treatment Outcomes Through Pharmacist-Led Education: Findings from a Malaysian Randomized Control Trial

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Abstract

Background:

Tuberculosis (TB) remains a major public health challenge, particularly in low- and middle-income countries. Despite being preventable and curable, poor adherence and treatment outcomes persist. Pharmacist-led interventions may improve TB management, but evidence in Southeast Asia is limited. This study evaluated the effect of structured pharmacist-led education on treatment adherence, cure rates, and sputum conversion among pulmonary Tuberculosis (PTB) patients in Malaysia.

Methods:

A single-blinded randomized controlled trial was conducted at Hospital Pulau Pinang, Malaysia. A total of 206 PTB patients were randomized into control (standard Directly Observed Therapy [DOT] by nurses) and intervention groups (DOT plus pharmacist-led counseling). The intervention included monthly structured education sessions covering TB knowledge, medication adherence, and lifestyle modifications. Outcomes were assessed at baseline, 2, 4, and 6 months, including treatment completion, cure rates, and sputum conversion time. Statistical analysis used chi-square tests, t-tests, and multivariate logistic regression.

Results:

The intervention group had a significantly higher cure rate (56.2% vs. 43.8%, *p* = 0.01) and a non-significantly shorter mean sputum conversion time (2.18 vs. 2.87 months, *p* = 0.7). Treatment completion rates were higher in the control group (67.9% vs. 32.1%, *p* = 0.2). Multivariate analysis showed males (AOR = 2.97, *p* = 0.01) and non-smokers (AOR = 3.62, *p* = 0.02) in the intervention group had better outcomes. Smoking was negatively associated with success in both groups (control AOR = 2.52, *p* = 0.01).

Conclusion: Pharmacist-led educational interventions improved cure rates and may enhance PTB treatment success, particularly among males and non-smokers. Integrating pharmacists into TB care programs could optimize outcomes in high-burden settings. Further research should explore long-term adherence and cost-effectiveness.