

Original Research Article

Quality of life and its determinants among pulmonary tuberculosis and multidrug-resistant tuberculosis patients receiving DOTS therapy in Lucknow District, Uttar Pradesh: a cross-sectional study

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ABSTRACT

Background: Tuberculosis (TB) remains a major public health challenge, and multidrug-resistant TB (MDR-TB) may impose an additional physical, psychological, and social burden. Quality of life (QoL) assessment provides information beyond conventional treatment outcomes. Objectives were to assess QoL among pulmonary tuberculosis (PTB) and MDR-TB patients and identify determinants of QoL in Lucknow district, Uttar Pradesh.

Methods: A cross-sectional analytical study was conducted among 214 TB patients receiving treatment through urban DOTS centres in Lucknow district from 1 September 2017 to 31 August 2018. Systematic random sampling was used; a target of five patients was interviewed each day, and every 10th registered patient was selected. If the selected patient did not fulfil the inclusion criteria, the next registered patient was included. Of the 214 participants, 157 had PTB and 57 had MDR-TB. Data were collected using a pretested structured questionnaire, and QoL was assessed using the medical outcomes study short form-36 (SF-36). Multiple linear regression was used to identify predictors of QoL.

Results: PTB patients had higher overall QoL scores than MDR-TB patients (42.7±18.8 versus 34.6±17.8). Significant differences were observed in physical functioning, role physical, bodily pain, general health, vitality, and social functioning. Poor social relationships were the strongest predictor of reduced QoL among PTB patients, whereas dissatisfaction with DOTS centre services was the strongest predictor among MDR-TB patients.

Conclusions: TB substantially impairs QoL, with a greater burden among MDR-TB patients. Psychosocial support, stigma reduction, patient-centred DOTS services, and improved patient-provider interactions should be integrated into TB care.

Keywords: DOTS, Quality of life, Tuberculosis

INTRODUCTION

Tuberculosis remains one of the leading infectious causes of morbidity and mortality worldwide.¹ Despite significant advances in diagnosis, treatment, and public health interventions, the disease continues to pose substantial health, social, and economic challenges. India accounts for the highest burden of tuberculosis globally

and remains central to international TB elimination efforts.²

Historically, tuberculosis control programmes have focused on microbiological cure, treatment completion, and reduction in mortality. However, these conventional indicators fail to capture the broader impact of disease on patients' daily functioning and well-being. Tuberculosis

affects physical health, psychological status, social interactions, occupational productivity, and family life.

The emergence of multidrug-resistant tuberculosis has further complicated disease management. MDR-TB patients experience prolonged treatment duration, greater adverse drug reactions, social isolation, and economic hardship. Consequently, quality of life assessment has become increasingly important in understanding the true burden of tuberculosis.

Health-related quality of life (HRQoL) represents a multidimensional construct encompassing physical, mental, emotional, and social functioning. The medical outcomes study short form-36 (SF-36) is a widely validated instrument for measuring these domains and has been extensively used in chronic disease research.³

Limited data are available regarding QoL among tuberculosis patients in northern India, particularly comparing PTB and MDR-TB patients. Understanding determinants of QoL can facilitate the development of patient-centred interventions and strengthen tuberculosis control programmes.

Therefore, the present study was undertaken to assess quality of life and its determinants among PTB and MDR-TB patients receiving treatment under DOTS centres in Lucknow district.

METHODS

Study design and setting

A cross-sectional analytical study was conducted among tuberculosis patients receiving treatment through urban DOTS centres in Lucknow district, Uttar Pradesh, from 1 September 2017 to 31 August 2018.

Study population

The study population comprised confirmed pulmonary tuberculosis (PTB) and multidrug-resistant tuberculosis (MDR-TB) patients registered under the National Tuberculosis Control Programme and receiving treatment through the selected urban DOTS centres.

Sample size and sampling technique

A total of 214 tuberculosis patients were included in the study, comprising 157 PTB patients and 57 MDR-TB patients. A systematic random sampling method was used to select patients for interview. A target of five patients was set to be interviewed each day. Every 10th patient registered at the DOTS centre was selected for the study. If the selected patient did not fulfil the inclusion criteria, the next registered patient was considered for inclusion. No separate statistical sample-size calculation was documented; the final sample consisted of the eligible

patients recruited through this sampling procedure during the study period.

Inclusion criteria

Patients diagnosed with PTB or MDR-TB, aged 18 years or above, and willing to participate in the study were eligible for inclusion.

Exclusion criteria

Seriously ill patients who were unable to respond to the interview and patients who refused to provide consent were excluded from the study.

Data collection tool

Data were collected using a pretested structured questionnaire covering socio-demographic characteristics, personal habits, treatment history, psychosocial issues, stigma-related factors, and quality of life assessed using the SF-36 quality of life scale.

Quality of life assessment

The medical outcomes study short form-36 (SF-36) was used to assess quality of life across eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. The first four domains were considered the physical component, while the latter four represented the mental component.

Statistical analysis

Data were analysed using SPSS software. Descriptive statistics included frequencies, percentages, means, and standard deviations. Independent-sample t-tests and multiple linear regression analyses were performed. Statistical significance was considered at $p < 0.05$.

Ethical considerations

Ethical approval was obtained from the Institutional Ethics Committee of King George's Medical University, Lucknow. Written informed consent was obtained from all participants before enrolment.

RESULTS

Socio-demographic characteristics

The majority of PTB patients (52.2%) belonged to the 18-29-year age group, with a mean age of 31.8 ± 12.3 years. Among MDR-TB patients, 68.4% belonged to the same age group. Male predominance was observed in both PTB (61.1%) and MDR-TB (56.1%) groups.

Most participants belonged to lower socioeconomic strata. Among PTB patients, 73.9% belonged to class IV socioeconomic status, while 45.6% of MDR-TB patients belonged to the same category.

Treatment characteristics

Most PTB patients (80.3%) were newly diagnosed cases. In contrast, 77.2% of MDR-TB patients reported previous anti-tubercular treatment exposure.

Psychosocial issues

Approximately 47.1% of PTB patients reported dissatisfaction with DOTS centre services, compared with 64.9% of MDR-TB patients. Perceived stigma, neglect, and social discrimination were frequently reported. Among MDR-TB patients, 98.2% perceived adverse effects on family responsibilities.

Table 1: Comparison of quality-of-life domains.

Domains	PTB Mean±SD	MDR-TB Mean±SD	P value
Physical component			
Physical functioning	37.2±27.5	22.6±14.6	0.001
Role physical	46.5±22.1	1.44±0.4	0.001
Bodily pain	56.2±27.6	42.3±25.0	0.001
General health	41.8±14.3	32.4±15.8	0.001
PCS	41.8±21.9	32.1±15.8	0.003
Mental Component			
Vitality	37.4±22.9	27.0±19.8	0.002
Social functioning	49.2±20.8	42.3±22.5	0.030
Role emotional	44.6±22.6	39.7±21.0	0.460
Mental health	45.4±15.4	40.8±18.8	0.070
MCS	43.6±18.4	36.9±20.3	0.023

PTB patients exhibited significantly higher QoL scores across most physical and mental domains than MDR-TB patients.

Predictors of quality of life

PTB patients

Multiple regression analysis demonstrated that monthly family income, duration of DOTS treatment, substance abuse, dissatisfaction with DOTS services, perceived neglect, and poor social relationships explained 48.1% of variability in QoL (adjusted $R^2=0.481$). Poor social relationships emerged as the strongest predictor.

MDR-TB patients

Among MDR-TB patients, low socioeconomic status, duration of treatment, family history of TB, effect on family responsibilities, perceived neglect, and

dissatisfaction with DOTS services explained 56.3% of variability in QoL (adjusted $R^2=0.563$). Unsatisfactory DOTS services emerged as the strongest predictor.

DISCUSSION

The present study demonstrates that tuberculosis exerts a profound adverse impact on multiple dimensions of quality of life. Physical functioning, social functioning, emotional well-being, and general health perception were significantly compromised among affected individuals.

The younger age predominance observed in this study is consistent with previous reports from India and other developing countries, reflecting the concentration of disease among economically productive age groups. This has important implications for workforce productivity and socioeconomic development.

Male predominance among both PTB and MDR-TB patients aligns with national epidemiological trends. Higher exposure to occupational risk factors, smoking, migration, and healthcare-seeking behaviour may partially explain this pattern.

A key finding was the significantly lower QoL among MDR-TB patients compared with PTB patients.⁴ MDR-TB patients exhibited poorer scores across almost all physical and mental domains. The prolonged duration of treatment, higher pill burden, adverse drug effects, and greater social stigma likely contribute to this disparity.

Physical health domains were more severely affected than mental health domains in both groups. Physical functioning emerged as the most compromised domain among PTB patients, whereas role limitations due to physical problems were particularly severe among MDR-TB patients. These findings highlight the substantial functional limitations experienced by TB patients.

The study also underscores the importance of social determinants in shaping quality of life outcomes. Poor social relationships emerged as the strongest determinant of QoL among PTB patients.⁵ Social isolation, discrimination, and stigma can negatively affect treatment adherence and psychological well-being.^{6,7}

Among MDR-TB patients, dissatisfaction with DOTS services was identified as the strongest predictor of poor QoL.⁸ This finding emphasizes the need to strengthen patient-centred service delivery. Waiting times, accessibility issues, provider communication, and treatment support mechanisms may significantly influence patient experiences.⁹

The positive association between duration of treatment and quality of life suggests gradual recovery of health status with successful therapy.^{11,12} This reinforces the importance of adherence support throughout the treatment course.

The influence of socioeconomic status observed in this study further highlights the need for comprehensive social protection measures for TB patients.⁷ Economic hardship can impair nutrition, healthcare access, and treatment adherence, thereby affecting quality of life.⁸

Strengths of this study are: inclusion of both PTB and MDR-TB patients. Use of validated SF-36 instrument. Comprehensive assessment of psychosocial determinants. Application of multivariable regression analysis.

Limitations of this study are: Cross-sectional design limits causal inference. Single district study may limit generalizability. Self-reported measures may introduce response bias.

Implications for family medicine and primary care

Primary care physicians are often the first point of contact for tuberculosis patients. Routine assessment of quality of life can facilitate early identification of vulnerable individuals requiring psychosocial intervention. Integration of counselling services, stigma reduction programmes, family support strategies, and patient-friendly DOTS services may substantially improve treatment outcomes and patient satisfaction.

CONCLUSION

Tuberculosis significantly impairs quality of life, particularly among MDR-TB patients. Physical health domains are more severely affected than mental health domains. Poor social relationships, perceived neglect, socioeconomic disadvantage, and dissatisfaction with DOTS services are major determinants of reduced quality of life. Strengthening patient-centred tuberculosis care through psychosocial support, stigma reduction, and improved healthcare services is essential for improving overall well-being and achieving national TB elimination goals.

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