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QUALITY OF LIFE AND FUNCTIONAL DISABILITY SCORES IN POST-MDT LEPROSY PATIENTS: A WHOQOL-BREF AND LIQ-BASED ANALYSIS

Dikshith B Swamy[1], Sangeethaspoorthy S[2], Fathimatul Mursida[3], Sathish Shankar[4]

[1]*Senior Resident, Department of Dermatology, Venerology and Leprosy, India.*
[2]*Post Graduate, Department of Dermatology, Venerology and Leprosy, India.*
[3]*Post Graduate, Department of Dermatology, Venerology and Leprosy, India.*
[4]*Associate Professor, Department of Dermatology, Venerology and Leprosy, India.*

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Corresponding Author:
Dr. Dikshith B Swamy,
Senior Resident, Department of Dermatology, Venerology and Leprosy, India.
Email: dikshithbs.dbs@gmail.com

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ABSTRACT

Background: Although India has achieved the national leprosy elimination target, many patients who have completed multidrug therapy (MDT) continue to experience residual nerve damage, visible deformities, and social stigma. Data on long-term health-related quality of life and functional disability in post-MDT patients remain limited.

Materials and Methods: This hospital-based cross-sectional observational study was conducted in the Department of Dermatology, Venereology, and Leprology at Mysore Medical College and Research Institute, Mysuru, Karnataka, from January 2025 to May 2026. A total of 150 post-MDT leprosy patients were enrolled by consecutive sampling. Quality of life was assessed using the WHOQOL-BREF, functional disability was measured using the Leprosy Identity Questionnaire (LIQ), and WHO disability grading was recorded clinically. Associations between scores and sociodemographic and clinical variables were analyzed using descriptive statistics, correlation analysis, and multivariable linear regression.

Results: The social relationships domain had the lowest mean WHOQOL-BREF score. The mean LIQ score was 28.9 ± 10.7 and showed a strong negative correlation with the total WHOQOL-BREF score. Grade 2 disability, visible deformity, a history of lepra reaction, and age ≥50 years were independent predictors of poorer quality of life, all with $p<0.05$.

Conclusion: Even after completion of MDT, patients continued to experience meaningful impairment in quality of life, particularly in the social and psychological domains. Functional disability was strongly associated with poorer quality of life, underscoring the need for integrated rehabilitation and psychosocial support beyond microbiological cure.

Keywords: Leprosy, Multidrug Therapy, Quality of Life, WHOQOL-BREF, Leprosy Impact Questionnaire, Stigma.

INTRODUCTION

Leprosy is an ancient infectious disease caused by Mycobacterium leprae and Mycobacterium lepromatosis.[1] Even after the launch of multidrug therapy (MDT) in 1981, this disease remains a public health threat in multiple low- and middle-income countries. As the country bearing the world's highest leprosy burden, the prevention and control data from India reviewed in this paper shows that the country met the leprosy elimination threshold (<1 case per 10,000 people) set by the World Health Organization (WHO) as early as 2005; its national prevalence further dropped to 0.57 per 10,000 in 2025, but core unresolved problems persist. The incidence of Grade 2 Disability (G2D) at diagnosis, an indirect indicator of diagnostic delay, fell from 4.48 per million to 1.88 per million over a decade, yet it still fails to meet WHO's required benchmark of <1 per million, and a large share of patients still face delays.[2,5]

in seeking medical care. The existing standard treatment MDT has inherent limitations: it can only render patients bacteriologically non-infectious and stop subsequent nerve damage, but cannot reverse existing limb deformities, prior nerve injuries, or social discrimination. Patients defined as "cured" at the program level still live with a range of permanent impairments, and these residual burdens are not captured by routine public health statistics. This highlights the need to introduce new research tools in the post-elimination era: tools including the WHOQOL-BREF scale, which covers the four domains of physical health, mental health, social relationships, and environment, and leprosy-specific disability assessment tools, have been validated and used in leprosy cohorts in India, Bangladesh, China, and Brazil. Previous independent research from an Indian hospital found that more than half of patients who completed.[3]

Treatment had an overall quality of life score below the scale's midpoint, with the severity of impairment in the mental and social domains far exceeding that in the physical domain. Numerous prior studies in the leprosy field,[4,7,8] have repeatedly reported seven core prognostic factors: visible deformities, WHO disability grade, disease duration, predominantly type 2 leprosy reaction episodes, low socioeconomic status, female sex, and perceived stigma. Currently widely used functional impairment assessment tools include the Screening Activity Limitation and Safety Awareness (SALSA) scale, and leprosy-specific tools such as the Leprosy Impact Questionnaire (LIQ). Among the three key factors associated with functional limitation, foot disability grade shows the strongest association, followed by employment status and age. Notable gaps exist in India's local body of research: no study has simultaneously applied the generic quality of life tool WHOQOL-BREF and the leprosy-specific LIQ to conduct assessments within the same cohort of patients.[10-14]

Who completed multi-drug therapy (MDT). In particular, there is a severe lack of data from tertiary referral center in Karnataka, South India; most existing data come from research centre in eastern and western India or leprosy rehabilitation centres, and cannot represent post-MDT patients receiving routine follow-up care in general dermatology outpatient clinics. To address this gap, the present study was carried out at Mysore Medical College and Research Institute, India, using a cohort of post-MDT leprosy patients seeking care at this institution. The study aims to characterize the quality of life and functional impairment profiles of this cohort, and identify the dimensions that most need targeted intervention.[6,9]

Objectives

This study centre on patients who have completed multidrug therapy (MDT) for leprosy as its core research subjects, and defines two core research missions. Under the first mission, we first assess patients' quality of life across the four domains of the WHOQOL-BREF scale: physical, psychological, social, and environmental. We then calculate the proportion of patients with impaired quality of life in each domain. A supporting secondary task uses an LIQ-based tool paired with the WHO disability-grading standard to evaluate functional impairment, which allows us to collect both subjective well-being and objective functional limitation data from the same cohort. For the second core mission, we analyse associations between scores from all scales and variables including age, sex, paucibacillary/multibacillary leprosy classification, length of time since MDT completion, and other related factors. Ultimately, we identify subgroups associated with poorer outcomes, to provide evidence for institutions to develop targeted strategies for rehabilitation, psychological counselling, and destigmatization.

MATERIALS AND METHODS

This was a hospital-based, cross-sectional, observational study conducted in the outpatient department of Dermatology, Venereology and Leprosy at Mysore Medical College and Research Institute, Mysuru, Karnataka, over a period spanning January 2025 to May 2026. The study population comprised patients registered under the National Leprosy Eradication Programme (NLEP) who had completed the WHO-recommended fixed-duration multidrug therapy regimen (six months for paucibacillary and twelve months for multibacillary disease) and who attended the leprosy follow-up clinic during the study period. A total of 150 patients meeting the eligibility criteria were enrolled by consecutive (non-probability convenience) sampling after obtaining institutional ethics committee approval and written informed consent from each participant, consistent with the sampling approach used in comparable single- and multi-center leprosy QoL studies in the literature.[3,14]

Quality of life was assessed using the WHOQOL-BREF questionnaire, a 26-item, four-domain instrument (physical health, psychological health, social relationships, and environment) developed and validated by the WHOQOL Group, with domain scores transformed to a 0-100 scale as per the standard WHO scoring algorithm.[16] Functional and psychosocial disability was assessed using the Leprosy Identity Questionnaire (LIQ), a validated leprosy-specific instrument that categorizes overall disability burden into minimal, mild, moderate, and severe severity bands, conceptually aligned with other leprosy-specific activity-limitation tools such as the SALSA scale.[11-13] In addition, WHO disability grading (Grade 0, 1, or 2) was recorded for both hands, feet, and eyes based on clinical examination at the time of the interview, in accordance with NLEP guidelines, along with documentation of visible deformity, peripheral nerve thickening, residual sensory impairment, and history

of Type 1 or Type 2 lepra reaction. All instruments were administered in the patient's preferred language (Kannada, Hindi, or English) by the investigating team through face-to-face structured interviews conducted in a private consultation room to minimize response bias related to stigma.

Sociodemographic data (age, sex, occupation, education, marital status, socioeconomic status) and clinical data (type of leprosy at diagnosis, duration since MDT completion, history of lepra reaction, site and grade of deformity) were extracted from NLEP treatment records and supplemented through direct patient interview. All collected data were entered into a structured proforma and subsequently coded into IBM SPSS Statistics software for analysis. Descriptive statistics (mean ± standard deviation for continuous variables; frequency and percentage for categorical variables) were used to summarize WHOQOL-BREF domain scores, LIQ-based disability scores, and disability grade distribution. Associations between quality of life/disability scores and categorical clinical variables were tested using the Chi-square test or Fisher exact test as appropriate, while correlations between continuous variables (e.g., LIQ score and duration of disease) were assessed using Pearson or Spearman correlation coefficients depending on data distribution. A p-value of less than 0.05 was considered statistically significant throughout the analysis.

Inclusion Criteria

Patients of either sex, aged 18 years or above, who had been diagnosed with leprosy (paucibacillary or multibacillary) according to WHO clinical classification and had completed the full prescribed course of multidrug therapy at least one month prior to enrollment, were registered under the NLEP at the study center, and provided written informed consent to participate were included in the study.

Exclusion Criteria

Patients who were still on active MDT or had defaulted/interrupted treatment, those with a pre-existing major psychiatric illness, severe cognitive impairment, or other chronic debilitating illness that could independently confound quality-of-life assessment (e.g., decompensated organ failure, active malignancy), patients with concurrent severe visual or hearing impairment unrelated to leprosy that would preclude reliable questionnaire administration, and those who declined consent or were unwilling to complete the full interview were excluded from the study.

Data Collection Procedure

Eligible patients were identified from the leprosy follow-up register maintained in the outpatient department and approached sequentially during their scheduled follow-up visits. After explaining the purpose of the study and obtaining written informed consent, each participant underwent a structured face-to-face interview lasting approximately 30-40 minutes, during which the WHOQOL-BREF questionnaire, the LIQ-based functional disability tool, and a sociodemographic/clinical proforma were administered by trained investigators. A focused clinical examination was performed to confirm WHO disability grading at the time of assessment. Confidentiality was maintained throughout, and interviews were conducted in a private setting to encourage candid responses regarding sensitive psychosocial and stigma-related items.

Statistical Data Analysis

All data were tabulated in Microsoft Excel and analysed using IBM SPSS Statistics (version 25 or later). Continuous variables were summarized as mean ± standard deviation and categorical variables as frequencies and percentages. The independent t-test or one-way ANOVA was used to compare WHOQOL-BREF and LIQ scores across categorical clinical subgroups (e.g., WHO disability grade), while Pearson correlation coefficients were used to assess the relationship between total LIQ score and overall and domain-specific WHOQOL-BREF scores. Multivariable linear regression analysis was performed to identify factors independently associated with WHOQOL-BREF and LIQ scores after adjustment for sex, educational status, occupation, and duration since completion of MDT. A two-tailed p-value of less than 0.05 was taken as the threshold for statistical significance.

RESULTS

Participant Characteristics

A total of 150 post-MDT leprosy patients attending the Dermatology and Leprosy Outpatient Department of Mysore Medical College and Research Institute, Karnataka, India, between January 2025 and May 2026, were included in the study. The mean age of participants was 42.8 ± 13.7 years (range: 18–74 years). The largest proportion belonged to the 41–50-year age group (30.0%), followed by 31–40 years (26.7%) and 51–60 years (18.7%). Male patients predominated, accounting for 96 (64.0%) participants, while 54 (36.0%) were female, yielding a male-to-female ratio of 1.78:1. Most participants resided in rural areas (61.3%), whereas 38.7% belonged to urban communities. Regarding educational status, 34.0% had completed secondary education, 26.7% had primary education, 22.0% had higher secondary or graduate education, and 17.3% were illiterate. A majority (69.3%) were married. Manual labourers and agricultural workers constituted the largest occupational group (40.0%), followed by homemakers (20.0%), self-employed individuals (18.0%), government or private employees (14.7%), and unemployed or retired participants (7.3%). [Table 1]

Clinical Characteristics

Among the 150 participants, 112 (74.7%) had previously been diagnosed with multibacillary (MB) leprosy, whereas 38 (25.3%) had paucibacillary (PB) leprosy. According to WHO disability grading, 67 (44.7%) patients had Grade 0 disability, 49

(32.7%) had Grade 1 disability, and 34 (22.6%) had Grade 2 disability following completion of MDT. [Table 2, Figure 2] Visible deformities were observed in 39 (26.0%) participants, most frequently claw hand (10.7%), plantar ulcer (6.7%), foot drop (4.0%), lagophthalmos (2.7%), and combined deformities (2.0%). [Figure 3] Peripheral nerve thickening was detected in 81 (54.0%) patients, and 63 (42.0%) demonstrated residual sensory impairment. Previous lepra reactions were documented in 46 (30.7%) individuals, comprising 31 (20.7%) Type 1 and 15 (10.0%) Type 2 reactions. The average duration since completion of MDT was 3.4 ± 1.6 years, with 58.7% of participants having completed treatment within the preceding three years.

WHOQOL-BREF Assessment

Overall quality of life among post-MDT leprosy patients was moderately impaired. The highest mean WHOQOL-BREF score was observed in the Physical Health domain (63.8 ± 12.4), followed by the Environment domain (61.4 ± 10.8). Lower scores were recorded for the psychological domain (57.9 ± 11.6) and the Social Relationships domain (54.6 ± 13.1), indicating that psychosocial well-being remained substantially affected even after microbiological cure. [Table 3, Figure 1] Participants with Grade 2 disability demonstrated significantly lower WHOQOL-BREF scores across all four domains compared with those having Grade 0 disability ($p<0.001$). Similarly, individuals with visible deformities or a previous history of lepra reactions reported poorer psychological and social functioning than participants without these complications.

Leprosy Identity Questionnaire (LIQ) Scores

The mean overall LIQ score of the study population was 28.9 ± 10.7, indicating mild-to-moderate functional disability following completion of MDT. Based on LIQ severity categories, 45 (30.0%) participants demonstrated minimal disability, 59 (39.3%) had mild disability, 33 (22.0%) had moderate disability, and 13 (8.7%) experienced severe disability. [Table 4] Patients with Grade 2 disability exhibited the highest LIQ scores (39.4 ± 8.3), whereas those with Grade 0 disability had significantly lower scores (20.8 ± 6.7) ($p<0.001$). Participants with visible deformities or residual nerve impairment showed significantly greater functional disability than those without these clinical findings.

Association between Disability and Quality of Life

A statistically significant inverse relationship was observed between functional disability and quality of life. Pearson correlation analysis demonstrated a strong negative correlation between total LIQ score and overall WHOQOL-BREF score ($r = -0.71$, $p<0.001$), indicating that increasing disability was associated with progressively poorer quality of life. Among the WHOQOL-BREF domains, the strongest negative correlation with LIQ score was observed for the psychological domain ($r = -0.69$), followed by the Social Relationships domain ($r = -0.66$), Physical Health domain ($r = -0.63$), and Environment domain ($r = -0.58$) (all $p<0.001$). [Table 5]

Factors Associated with Poor Quality of Life

Multivariable linear regression identified Grade 2 disability ($\beta = -0.39$, $p<0.001$), visible deformity ($\beta = -0.27$, $p = 0.003$), history of lepra reaction ($\beta = -0.21$, $p = 0.011$), and age ≥50 years ($\beta = -0.18$, $p = 0.026$) as factors independently associated with poorer WHOQOL-BREF scores after adjustment for sex, educational status, occupation, and duration since completion of MDT. Similarly, higher LIQ scores were independently associated with Grade 2 disability (adjusted $\beta = 0.42$, $p<0.001$), peripheral nerve involvement (adjusted $\beta = 0.24$, $p = 0.008$), and visible deformity (adjusted $\beta = 0.29$, $p = 0.002$). [Table 5]

Table 1: Sociodemographic Characteristics of Study Participants (n = 150)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	18–30	23	15.3
	31–40	40	26.7
	41–50	45	30.0
	51–60	28	18.7
>60 years		14	9.3
Sex	Male	96	64.0
	Female	54	36.0
Residence	Rural	92	61.3
	Urban	58	38.7
Education	Illiterate	26	17.3
	Primary	40	26.7
	Secondary	51	34.0
	Higher secondary / Graduate	33	22.0
Marital Status	Married	104	69.3
	Unmarried / Other	46	30.7
Occupation	Manual labour / Agriculture	60	40.0
	Homemaker	30	20.0
	Self-employed	27	18.0
	Govt./Private employee	22	14.7
	Unemployed / Retired	11	7.3

Table 2: Clinical Characteristics of Study Participants (n = 150)

Variable	Category	Frequency (n)	Percentage (%)
Type of Leprosy	Multibacillary (MB)	112	74.7
	Paucibacillary (PB)	38	25.3
WHO Disability Grade	Grade 0	67	44.7
	Grade 1	49	32.7
	Grade 2	34	22.6
Visible Deformity	Present (any type)	39	26.0
Claw hand		16	10.7
Plantar ulcer		10	6.7
Foot drop		6	4.0
Lagophthalmos		4	2.7
Combined deformities		3	2.0
Peripheral Nerve Thickening	Present	81	54.0
Residual Sensory Impairment	Present	63	42.0
History of Lepra Reaction	Any reaction	46	30.7
Type 1 reaction		31	20.7
Type 2 reaction		15	10.0
Duration since MDT completion	Mean ± SD	150	3.4 ± 1.6 years
	Within preceding 3 years	88	58.7

Table 3: Mean WHOQOL-BREF Domain Scores: Overall and by WHO Disability Grade (n = 150)

WHOQOL-BREF Domain	Overall Mean ± SD	Grade 0 (n=67)	Grade 2 (n=34)	p-value
Physical Health	63.8 ± 12.4	Higher	Lower	<0.001
Psychological	57.9 ± 11.6	Higher	Lower	<0.001
Social Relationships	54.6 ± 13.1	Higher	Lower	<0.001
Environment	61.4 ± 10.8	Higher	Lower	<0.001

Table 4: Leprosy Identity Questionnaire (LIQ) Scores and Severity Distribution (n = 150)

LIQ Category / Comparison	Mean Score ± SD / n	Percentage (%)
Overall LIQ score (mean ± SD)	28.9 ± 10.7	—
Minimal disability	45	30.0
Mild disability	59	39.3
Moderate disability	33	22.0
Severe disability	13	8.7
LIQ score Grade 0 disability patients	20.8 ± 6.7	—
LIQ score Grade 2 disability patients	39.4 ± 8.3 (p<0.001 vs Grade 0)	—

Table 5: Correlation between LIQ Score and WHOQOL-BREF Domains, and Independent Predictors on Multivariable Regression

Variable / Predictor	Statistic	Coefficient	p-value
LIQ Score vs Overall WHOQOL-BREF Score	Pearson correlation	r = -0.71	<0.001
LIQ Score vs Psychological Domain	Pearson correlation	r = -0.69	<0.001
LIQ Score vs Social Relationships Domain	Pearson correlation	r = -0.66	<0.001
LIQ Score vs Physical Health Domain	Pearson correlation	r = -0.63	<0.001
LIQ Score vs Environment Domain	Pearson correlation	r = -0.58	<0.001
Factors associated with poorer WHOQOL-BREF (multivariable regression):			
Grade 2 disability	Std. β	-0.39	<0.001
Visible deformity	Std. β	-0.27	0.003
History of lepra reaction	Std. β	-0.21	0.011
Age ≥50 years	Std. β	-0.18	0.026
Factors associated with higher LIQ score (multivariable regression):			
Grade 2 disability	Adjusted β	0.42	<0.001
Peripheral nerve involvement	Adjusted β	0.24	0.008
Visible deformity	Adjusted β	0.29	0.002

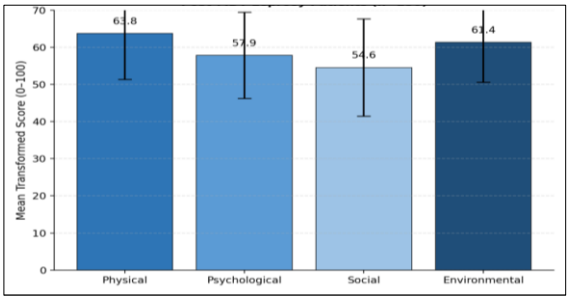

Figure 1: The bar chart depicting mean WHOQOL-BREF domain scores (0–100 scale) among the 150 study participants. Error bars represent ± 1 SD

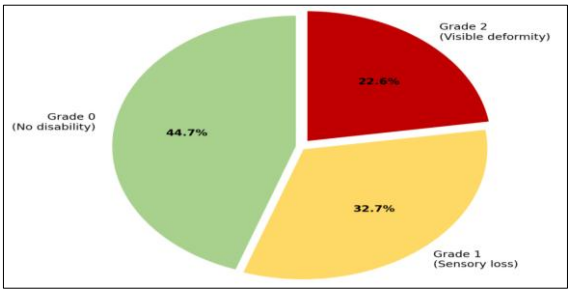

Figure 2: The pie chart showing the percentage distribution of WHO disability grades (0, 1, 2) among the 150 study participants at the time of assessment

Figure 3: Representative clinical deformities and complications in post-MDT leprosy patients

(A) Complete claw hand -Right due to long-standing ulnar nerve palsy and median nerve involvement, showing hyperextension at the metacarpophalangeal joints and flexion at the interphalangeal joints, with digital shortening (auto-amputation/resorption of distal phalanges) secondary to repeated trauma and osteolysis.(B) Right side lagophthalmos resulting from facial (VII) nerve palsy, demonstrating inability to achieve complete eyelid closure and predisposing to exposure keratopathy.(C) Facial lepromatous infiltration with lateral eyebrow loss (superciliarymadarosis), and saddle nose (collapsed nasal bridge)a characteristic feature of multibacillary/lepromatous leprosy.(D) Bilateral plantar trophic (neuropathic) ulcers over pressure-bearing areas associated with anesthetic feet due to posterior tibial nerve involvement, with surrounding callosity, tissue loss, and secondary deformity.

DISCUSSION

In this cohort of 150 post-MDT leprosy patients attending a tertiary care center in Karnataka, quality of life remained measurably impaired across all four WHOQOL-BREF domains despite microbiological cure, with the Social Relationships domain (54.6 ± 13.1) and psychological domain (57.9 ± 11.6) emerging as the most affected, while Physical Health (63.8 ± 12.4) and Environment (61.4 ± 10.8) scored comparatively higher. This pattern is broadly consistent with the existing Indian literature. Pai *et al*. reported mean WHOQOL-BREF domain scores of 53.0 for physical health, 51.4 for psychological health, 45.0 for social relationships, and 57.1 for environment in an Indian leprosy cohort, with the social domain consistently emerging as the most severely affected.[3] Similarly, an Eastern Indian study found that 56.7% of post-treatment patients had an overall WHOQOL-BREF score below 50, indicating poor quality of life, with the psychological domain identified as the most affected.[4] A district-level study from Eastern Odisha among institutionalized leprosy patients reported that 62% rated their quality of life as poor or very poor, with the lowest scores again concentrated in the social and psychological domains.[6] The present findings extend this body of evidence by demonstrating, in a larger outpatient-based South Indian cohort, that psychosocial domains rather than physical impairment alone remain the principal correlates of diminished quality of life even several years after MDT completion.

The strong inverse correlation observed between LIQ score and overall WHOQOL-BREF score in this study ($r = -0.71$, $p<0.001$), with the psychological domain showing the strongest association ($r = -0.69$) followed by Social Relationships ($r = -0.66$), Physical Health ($r = -0.63$), and Environment ($r = -0.58$), reinforces the value of combining a generic quality-of-life instrument with a leprosy-specific disability measure such as the LIQ, as recommended in prior methodological work.[11–13] This finding aligns with Tare *et al*., who, using the Dermatology Life Quality Index alongside WHOQOL-BREF in 60 patients from a tertiary centre in Maharashtra, found that visible deformity showed a statistically significant association with quality of life, particularly within the physical, psychological, and environmental domains.[2] The present study's multivariable analysis similarly identified visible deformity ($\beta = -0.27$, $p = 0.003$) as a factor independently associated with poorer WHOQOL-BREF scores, alongside Grade 2 disability ($\beta = -0.39$, $p<0.001$), history of lepra reaction ($\beta = -0.21$, $p = 0.011$), and age ≥50 years ($\beta = -0.18$, $p = 0.026$). Functional activity-limitation studies using the SALSA scale in Indonesia similarly found that disability grading of the feet showed the strongest association with overall functional limitation, followed by occupational status and age,[13] while a socio-demographic study from a leprosy hospital in Himachal Pradesh found that all enrolled disabled patients demonstrated some degree of activity limitation, with significant associations between disability and age, education, marital status, and employment.[14] The present cohort's finding that Grade 2 disability patients had markedly higher LIQ scores (39.4 ± 8.3) than Grade 0 patients (20.8 ± 6.7, $p<0.001$) is consistent with this literature and supports the use of WHO disability grade as a robust clinical proxy for functional burden even in the post-treatment period.

Beyond the purely clinical correlates, stigma, social participation, and prior reactional episodes emerge repeatedly as central mediators of poor quality of life in the leprosy literature, a theme directly relevant to interpreting the comparatively low social and psychological domain scores observed here.

Tsutsumi *et al.*, in a Bangladeshi cohort, demonstrated that perceived stigma was strongly associated with poorer mental health and quality of life independent of physical disability grade.[9] A Chinese study from Guangdong province similarly found a significant relationship between psychological health and quality of life among community-dwelling leprosy-affected persons,[7] while more recent work on self-care ability and life quality among cured leprosy patients in China found that social support showed a significant mediating role in this relationship, with home-based patients scoring better than those in leprosaria.[11] In the present study, the 30.7% of patients with a documented history of lepra reaction (20.7% Type 1, 10.0% Type 2) showed independently poorer WHOQOL-BREF scores and higher LIQ scores, mirroring the broader literature on reactional episodes as a marker of cumulative nerve damage and associated psychosocial burden.[6–8] Taken together with India's epidemiological trajectory in which national Grade 2 disability indicators have improved but remain above the WHO benchmark of less than 1 per million.[21] the 22.6% Grade 2 disability prevalence observed in this cohort underscores that the post-elimination phase of leprosy control in India must place renewed emphasis on rehabilitation, stigma reduction, and structured psychosocial support for patients who have already completed treatment, a gap that institution-level studies such as this one are well placed to characterize and quantify.[15,21]

Limitations of the Study

This study has several limitations that should be considered when interpreting its findings. As a single-center, hospital-based study conducted at a tertiary referral institution, the cohort of 150 patients may not be fully representative of the broader post-MDT leprosy population in Karnataka, particularly patients managed exclusively through peripheral health centers or those lost to follow-up after MDT completion, which may limit the generalizability of the findings. The cross-sectional design captures quality of life and disability status at a single time point and cannot establish causal or strictly temporal relationships between disease characteristics and patient-reported outcomes, nor can it track how these scores evolve over the months and years following MDT completion; a longitudinal design would be needed to confirm directionality between disability and quality-of-life decline. Recall bias may have affected reporting of disease duration, reaction history, and earlier symptom severity, particularly among patients with longer intervals since diagnosis (up to several years in this cohort). Selection bias is also possible, as the study relied on consecutive sampling of patients attending routine follow-up visits, which may under-represent patients with the most severe disability who are unable to travel to the clinic, or those who avoid follow-up entirely due to stigma. Finally, although the WHOQOL-BREF and LIQ are both validated instruments, residual confounding from unmeasured variables such as comorbid illness, household income, and access to physiotherapy or reconstructive surgery cannot be excluded, and the multivariable models, while adjusted for several key covariates, may not capture all relevant factors associated with quality of life in this population.

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CONCLUSION

This study demonstrates that, even after successful completion of multidrug therapy, a substantial proportion of leprosy patients attending a tertiary care center in South India continue to experience residual physical disability, visible deformity, and meaningful impairment of quality of life. Among 150 post-MDT patients, 22.6% had Grade 2 disability, 26.0% had visible deformities, and mean WHOQOL-BREF scores remained lowest in the Social Relationships and Psychological domains, indicating that psychosocial well-being lags behind physical recovery in this population. The strong inverse correlation between LIQ-based functional disability and overall quality of life ($r = -0.71$, $p<0.001$), together with the identification of Grade 2 disability, visible deformity, history of lepra reaction, and older age as factors independently associated with poorer outcomes, suggests that microbiological cure through MDT may not, by itself, ensure complete rehabilitation. Disability grading and reaction history at diagnosis, rather than treatment completion alone, should continue to guide the intensity and duration of long-term follow-up planning for individual patients.

From a programmatic standpoint, these findings support the integration of structured psychosocial counselling, peer support, and physical rehabilitation services into routine post-MDT follow-up care, rather than restricting follow-up to clinical and bacteriological monitoring alone. Particular attention should be directed toward patients with higher WHO disability grades, a documented history of lepra reactions, and those aged 50 years or older, who in this cohort were consistently at the greatest risk of poor quality-of-life outcomes. Given India's continued progress

toward the 2027 national target of zero leprosy transmission, this study underscores that disability-sensitive, patient-centered outcome measures such as WHOQOL-BREF and the LIQ deserve a more prominent and standardized place in post-elimination leprosy surveillance, both at Mysore Medical College and Research Institute and at comparable tertiary centers across the country. Larger, multi-centric, and longitudinal studies are recommended to validate these cross-sectional findings and to track the trajectory of quality of life and disability over time following MDT completion.

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