

A Cross-sectional Study to Assess the Mental Health Status of Leprosy - Affected Persons in Hyderabad, Telangana, India

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Leprosy is a chronic infectious disease that not only affects the physical health of a person but also has profound emotional and psychological effects which adversely affect their mental health. The insights gathered from this study will aid in addressing the challenges faced by leprosy patients and in creating effective strategies to enhance their mental health. The objectives were to determine the prevalence of mental health disorders among leprosy-affected individuals and to identify the factors that impact their mental health. A cross-sectional study was conducted among leprosy-affected individuals aged 18 years and older who were receiving treatment at the Sivananda Rehabilitation Centre in Hyderabad from April to August 2022. A semi-structured questionnaire was administered to 200 individuals. This questionnaire included questions on sociodemographic factors, degree of physical deformity, and family support, as well as mental health status, which was assessed using the DASS-21 (Depression, Anxiety, and Stress Scale). The mean age of leprosy-affected individuals was 44.1 ± 14.8 years old. 53% of the patients were illiterate. The prevalence of depression, Anxiety and Stress in leprosy-affected individuals was found to be 12.5%, 19% and 3%. Depression was associated with younger age and higher socioeconomic status while anxiety was associated with unemployment and whose family left after diagnosis. These findings highlight the importance of addressing the mental health needs of individuals affected by leprosy.

Keywords : Anxiety, DASS 21 Scale, Depression, Leprosy-affected persons, Mental health status, Stress

Introduction

Leprosy is a chronic infectious disease that affects the peripheral nerves and skin, leading to physical deformities and disabilities. Individuals affected by leprosy not only experience physical deformities, but also a range of emotional and psychological problems that can adversely affect their mental health, such as feelings of shame, low self-esteem, and social exclusion, which can significantly reduce their quality of life. The

incidence of leprosy in India is significant, with an estimated disease burden of approximately 21,100 disability-adjusted life years (DALYs). However, the main focus of leprosy is on treatment, deformity correction surgeries, and preventive aspects, with less importance to addressing stigma and mental health issues. In 2021-2022, a total of 61,678 leprosy cases were under treatment, with a prevalence rate of 0.45 per 10,000 population (as of March 2021)

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and a grade-2 disability rate of 1.36 per million population. Most of the newly detected cases were multibacillary, with 61% falling under this category (NLEP- NSP 2023).

The stigmatization and discrimination faced by people with leprosy further exacerbates their mental health problems and hinders their ability to access healthcare services. Mental health problems, such as depression and anxiety, can lead to reduced motivation, fatigue, and a loss of interest in daily activities, which can make it difficult to manage the physical symptoms of leprosy and maintain a healthy lifestyle. According to Bhatia et al (2006), leprosy-affected persons had a significantly higher prevalence of psychiatric morbidity (44.4%) than healthy persons (7.5%). Despite the well-documented impact of leprosy on mental health, there is still a significant gap in research on this topic, especially in developing countries where the burden of leprosy is high. Therefore, this study aims to fill this gap by evaluating the mental health status of leprosy-affected individuals and identifying the risk factors associated with poor mental health outcomes. The findings of this study can help in the development of interventions to address the mental health needs of individuals affected by leprosy.

Objectives of this study are: (i) To assess the mental health status of leprosy patients with the Depression Anxiety Stress Scale (DASS) 21 which is a validated tool (DASS 21, University of Bristol). and (ii) To identify the factors that impact their mental health.

Materials and Methods

This cross-sectional study was conducted at the Sivananda Rehabilitation Home, a tertiary leprosy care center in Hyderabad from April to August 2022. This is a tertiary nodal center with a high caseload of patients with leprosy-associated disability. These patients are diagnosed, classified and managed as per NLEP and WHO guidelines

(Brandsma & van Brakel 2003, NLEP 2013). Cases from across Telangana and other neighboring states come here for reconstructive surgeries. By taking the prevalence of mental health disorders among leprosy-affected persons as 15% (Jindal et al 2013), 5% absolute error, and 95% confidence interval, sample size of 196 was calculated which was rounded off to 200. Adult patients who presented to this center during the study period, who satisfied the inclusion criteria and gave their consent were included in the study till we reached the sample size of 200. Ethical approval was obtained from the Institutional Ethical Committee at Osmania Medical College, Hyderabad, Telangana. Permission was also granted by the Chief Administrator of the Sivananda Rehabilitation Home, Kukatpally, Hyderabad. A pre-designed, semi-structured questionnaire that included questions on their socio-demographic profile, degree of deformity, and family support was used. Mental health status was evaluated using the Depression Anxiety Stress Scale (DASS) 21 (Jindal et al 2013), which consists of three components: Depression, Anxiety, and Stress. Each component includes seven questions, with a total of 21 questions (DASS 21, University of Bristol). Participants were asked to indicate how each statement applied to them in the past week, using a 4-point Likert scale (0-3). Scores for each component were added and multiplied by 2 to obtain the final score, which was then used to grade the severity of depression, anxiety, and stress as mild, moderate, severe, or very severe. The data was entered into Microsoft Excel and analyzed using SPSS version 20.0. Frequencies and percentages were used and the association between the variables was tested using the chi-square test.

Results

Results of this study are summarized in Tables 1 to 3.

Table 1 shows that the average age of individuals affected by leprosy was 44.1±14.8 years. The

Table 1 : Demographic data of subjects included in the study.

DEMOGRAPHIC VARIABLES	CATEGORIES	N (%)
Gender	Male	123 (61.5%)
	Female	77 (38.5%)
Age	18-39 years	67 (33.5%)
	40-59 years	95 (47.5%)
	≥ 60 years	38 (19%)
Mean age		44.1±14.8
Religion	Christian	17 (8.5%)
	Hindu	169 (84.5%)
	Muslim	14 (7%)
Education	Illiterate	106 (53%)
	Literate	94 (47%)
Employment status	Employed	109 (54.5%)
	Unemployed	91 (45.5%)
Family support	Left	18 (9%)
	Supporting	183 (91.5%)
Socio-economic status	Lower-class	67 (33.5%)
	Upper-class	133 (66.5%)
Grade of deformity	Grade-0	16 (8%)
	Grade-1	18 (9%)
	Grade-2	166 (83%)

Table 2 : Grades of depression, anxiety and stress using DASS-21 scale.

Severity	Depression	Anxiety	Stress
No psychiatric morbidity	175 (87.5%)	162 (81%)	194 (97%)
Psychiatric morbidity-present	25 (12.5%)	38 (19%)	6 (3%)
Grades of psychiatric morbidities			
Mild	11	18	4
Moderate	12	15	2
Severe	2	3	0
Extremely severe	0	2	0

study population consisted of 61.5% males and 38.5% females. The majority of participants belonged to the middle-class category (84.5%), with 27% classified as upper middle class, 37%

as middle class, and 20.5% as lower middle class, as per the BG Prasad updated scale for 2022 (Pentapati & Debnath 2023). The mean disease duration from the time of diagnosis was 12.8

Table 3 : Association of socio-demographic variables with psychiatric morbidities.

Variables	Depression			Anxiety			Stress		
	Yes	X2	p-value Logistic regression	Yes	X2	p-value Logistic regression	Yes	X2	p-value Logistic regression
Gender									
Male (n=123)	15	0.86	0.764	23	0.89	0.853	4	0.79	1.0
Female (n=77)	10			15			2		
Age (in years)									
18-39 (n=67)	15	0.01	0.025	15	0.34	0.419	4	0.23	1.0
40-59 (n=95)	8			14			1		
>60 (n=38)	2			9			1		
Religion									
Hindu(n=169)	17	0.01	0.141	31	0.58	0.833	2	0.005	0.99
Non-Hindu(n=31)	8			7			4		
SES									
Lower class(n=67)	2	0.004	0.246	9	0.15	0.978	1	0.66	1.0
Upper class(n=133)	23			29			5		
Employment									
Employed (n=109)	10	0.12	0.725	14	0.015	0.07	4	0.54	0.99
Unemployed(n=91)	15			24			2		
Family support									
Abandoned (n=18)	3	0.57	0.590	7	0.02	0.033	2	0.16	
Supporting (n=182)	22			31			4		
Deformities									
G-0 (n=16)	2	0.42	0.549	3	0.77	0.147	1	0.06	1.0
G-I (n=18)	4			7			2		
G-II (n=166)	19			28			3		
Duration of leprosy									
<5 yrs (n=91)	14	0.51	0.430	19	0.70	0.618	3	0.97	1.0
5-10 yrs (n=34)	3			7			1		
>10 yrs (n=75)	8			12			2		
Education									
Illiterate(n=106)	9	0.07	0.957	17	0.25	0.423	2	0.32	1.5
Literate(n=94)	16			21			4		
Stigma									
Yes (n=15)	14	0.00	0.000	12	0.00	0.000	5	0.0	0.99
No (n=185)	11			26			1		

years. The majority (97%) of the participants had multibacillary leprosy (MB). Participants exhibited varying degrees of deformities, with 83% having grade 2, 9% having grade 1, and 8% had grade 0. About 91% of the participants were supported by their families.

Table 2 shows that the prevalence of depression was 12.5% (7.5% in men and 5% in women), the prevalence of anxiety was 19% (11.5% in men and 7.5% in women), and the prevalence of stress was 3% (2% in men and 1% in women). The mean scores of depression, anxiety and stress were 3.56, 3.6, and 2.83 respectively.

Table 3 shows a significant association between depression and socioeconomic status, with those in higher socioeconomic strata experiencing a higher prevalence of depression than patients from lower socioeconomic status ($p=0.004$). The age group of 18 to 39 years also showed a higher prevalence of depression compared to other age groups ($p=0.01$). Unemployed participants had significantly more anxiety ($p=0.015$). In addition, leprosy patients whose families left them after diagnosis with the disease had more anxiety ($p=0.02$). The study also revealed that individuals who were recently diagnosed with leprosy (<5 years) had a higher prevalence of depression compared to those diagnosed earlier. However, no statistical difference was found between depression and factors such as sex, family support, and stress.

Table 3 also summarizes the association of co-variables with depression, anxiety and stress using logistic regression by Enter method. Factors like younger age and leprosy persons experienced stigma had significantly higher depression. Leprosy patients whose family abandoned them after diagnosis with the disease and who experienced stigma had significantly more anxiety.

Discussion

Most of the respondents in the present study

were males (61.5%), married (80%), and employed (54.5%). Similar findings were also seen in a study by Roberts et al (2022) in Kolkata, where the majority were males (80.8%), married (71.7%), and employed (57.6%). The mean age of the study participants in the present study was 44.1 ± 14.8 years. Similarly, in another study by Govindasamy et al (2021) the mean age of the study participants was 39 ± 13 years, with 64% males. In the present study, most of the participants were Hindus (84.5%) and illiterates (53%). Similarly, in a study by van Dorst et al (2020) the majority were Hindus (95.1%) and illiterates (83.8%), with a mean age of 56.8 ± 13.54 years. Findings from our study and other studies indicate that males are more affected, and it is mostly seen in middle-aged individuals. As most of the males go outside for work to earn a livelihood, they might be more prone for depression as they face the societal pressures and possibly negative behaviour.

The present study indicates that leprosy-affected individuals have a higher prevalence of depression (12.5%), anxiety (19%), and stress (3%) compared to the global and Indian prevalence of depression among the general population, which is 3.8% (van Dorst et al 2020) and 5.25% (WHO 2023), respectively. Leprosy-affected individuals also experience feelings of fear, shame, and low self-esteem (Arvind et al 2019). These feelings could contribute to psychiatric morbidities in some of the leprosy patients. A higher prevalence of depression was reported by 53% (Roberts et al 2022), 42.5% (van 't Noordende et al 2019) and 24.6% (van Dorst et al 2020). This difference in the prevalence of depression with the present study could be attributed to the usage of different scales (PHQ-9) which were used for depression assessment and also the variable socio-demographic factors in those populations as these studies were done in different regions.

The present study found that higher socioeconomic status and younger age were

more associated with depression. Leprosy is often regarded as the disease of the poor and downtrodden. People of higher socioeconomic status were found to be more depressed as they were possibly unable to deal with the stigma and castigation of leprosy. Young patients feel more awkward and discriminated because of deformities when they face people during their education and occupational interactions. However, in the study by Govindasamy et al (2021), the grade of deformity (I, II) and males were at more risk of developing depression, which was not seen in the present study. Unemployed participants and those whose families abandoned them after diagnosis with leprosy had significantly more anxiety in the present study, whereas in the study by Govindasamy et al (2021), the presence of deformity (I, II), low education level, and low socioeconomic status were more associated with anxiety. Loneliness due to desertion by their family members and unable to earn livelihood could have contributed to increased anxiety.

In the present study, the duration of leprosy, presence, and grade of deformities were not significantly associated with depression or anxiety. Similarly, in a study by Bhatia et al (2006), there was no significant association between the duration of leprosy, severity of the deformity, and psychiatric diagnosis (Bhatia et al 2006). Deformities continue to be serious problem even in recent years, Mahajan et al (2018) in a study from a tertiary care centre in Gujarat found that 12-14% of patients reporting to their centre had grade 2 disability/ deformities of hands/feet whereas more than 20% had eye complications and disfigurement of face as well (Mahajan et al 2018). It would be important to study the mental health problems of such individuals and provide solutions for their physical, social, and mental well-being. Our study highlights the complex interplay between physical disability and mental health outcomes in individuals affected by

leprosy. Physical deformities and disfiguration in leprosy patients restrict them from earning a livelihood and hamper their social life, which could impact their mental health.

By using the chi-square test, younger age, non-Hindu religion, and higher socioeconomic status were significantly associated with depression, while unemployed persons, those abandoned by their family after diagnosis with leprosy had significantly higher anxiety and non-Hindu religion was significantly associated with stress. After doing logistic regression using Enter method and adjusting for confounding factors only younger age and stigma were found to be significantly associated with depression and patients whose family abandoned them after diagnosis with leprosy and stigma were significantly associated with anxiety.

Overall, the literature suggests that individuals affected by leprosy are at a higher risk of developing depression, anxiety, suicidal (attempts) etc. (Somar et al 2020). The prevalence of these mental health conditions may be influenced by factors such as gender, age, socioeconomic status, religion, and the presence of physical deformities/disabilities. It is essential to address these factors while providing mental health care to individuals affected by leprosy. Systematic review by Somar et al (2020) has also identified various useful interventions which could be considered when finding solutions to the problems of LAPs.

Our findings suggest the need for regular screening, psychological counseling, and support services for individuals affected by leprosy. Awareness programs should also be conducted to reduce stigma and discrimination towards individuals affected by leprosy, while healthcare professionals working with them should be trained to identify and manage mental health issues. Interventions should be designed to enhance family support for individuals affected

by leprosy, as it has been found to be protective against depression.

The duration between the diagnosis of leprosy and this interview to assess the mental health status of the individuals was quite variable. People who had long-standing leprosy might have had psychiatric morbidities in the past but now they could have adapted. The present study only elicited the present mental health status of leprosy-affected persons.

The present study has its own limitations. This study was done in a single leprosy tertiary rehabilitation centre. We were not able to carry out a multi-centric study due to lack of financial resources. While it would be incorrect to generalize these findings, these deserve to be given due attention in community-based research cum interventions in this region and the country. Pediatric age group leprosy cases were not included as during the pilot study using DASS scale among children we couldn't get proper responses, so in the main study we excluded them. Children and adolescents may have specific issues that could affect their mental health (Singh et al 2015). In addition, children and adolescents directly or indirectly affected by leprosy may have special problems that need to be attended to.

Conclusions

This study found that the prevalence of depression, anxiety, and stress among individuals affected by leprosy was considerable. The prevalence of depression was 12.5%, with a higher prevalence observed in individuals of higher socioeconomic status and the age group of 18 to 39 years. Furthermore, recently diagnosed individuals (<5 years) exhibited a higher prevalence of depression. However, no significant correlation was found between depression and factors such as sex, family support, and stress. These findings highlight the importance of addressing the mental health needs of individuals affected by leprosy,

particularly those in higher socioeconomic strata and younger age groups, to ensure better overall outcomes.

Recommendations

To ensure better mental health outcomes in individuals affected by leprosy, it is recommended that they undergo regular screening for depression, anxiety, and stress, with a particular focus on those in recently diagnosed (<5yrs) and younger age groups. Additionally, psychological counseling and support services should be made accessible to these individuals to help manage their mental health issues. To reduce the psychological burden experienced by individuals affected by leprosy, awareness programs should be implemented to decrease stigma and discrimination towards them. Healthcare professionals working with individuals affected by leprosy should be equipped with the necessary training to identify and manage mental health issues. Finally, interventions should be designed to increase family support for individuals affected by leprosy as family support has been shown to have a protective effect against depression.

References

1. Arvind BA, Gururaj G, Loganathan S et al (2019). Prevalence and socioeconomic impact of depressive disorders in India: multisite population-based cross-sectional study. *BMJ Open*. **9(6)**: e027250.
2. Bhatia MS, Chandra R, Bhattacharya SN et al (2006). Psychiatric morbidity and pattern of dysfunctions in patients with leprosy. *Indian J Dermatol*. **51(1)**: 23.
3. Brandsma JW, Van Brakel WH (2003). WHO disability grading: operational definitions. *Lepr Rev*. **74(4)**: 366–373.
4. DASS 21. <https://www.bristol.ac.uk/https://www.bristol.ac.uk/media-library/sites/sps/documents/c-change/dass-twenty-one-scoring-and-interpretation.pdf>
5. Govindasamy K, Jacob I, Solomon RM et al (2021). Burden of depression and anxiety among leprosy

- affected and associated factors—a cross sectional study from India. *PLoS Negl Trop Dis.* **15(1)**: e0009030.
6. Jindal KC, Singh GP, Mohan V et al (2013). Psychiatric morbidity among inmates of leprosy homes. *Indian J Psychol Med.* **35(4)**: 335-340.
 7. Mahajan R, Ninama K, Jain V et al (2018). A 5-year study of leprosy patients in a tertiary care centre. *Indian J Clin Exp Dermatol.* **4(3)**: 232-236.
 8. National Leprosy Eradication Programme (2013). Training Manual for Medical Officer. Central Leprosy Division, Directorate General of Health Sciences, Ministry of Health and Family Welfare, Government of India, January 2023. Available at <https://dghs.gov.in/>
 9. National Leprosy Eradication Programme. National Strategic Plan and Roadmap for Leprosy 2023-2027 (2023). Central Leprosy Division, Directorate General of Health Sciences, Ministry of Health and Family Welfare, Government of India, January 2023. Available at <https://dghs.gov.in/>
 10. Pentapati SSK, Debnath DJ (2023). Updated BG Prasad's classification for the year 2022. *J Family Med Prim Care.* **12(1)**: 189-190.
 11. Roberts H, Mahato J, Govindasamy K et al (2022). A study on depression using PHQ9 among patients attending outpatient department of a tertiary care leprosy hospital in the city of Kolkata, West Bengal. *Indian J Lepr.* **94**: 227-235.
 12. Singh K, Junnarkar M, Sharma S. (2015). Anxiety, stress, depression, and psychosocial functioning of Indian adolescents. *Indian J Psych.* **57(4)**: 367.
 13. Somar PMW, Waltz MM, van Brakel WH (2020). The impact of leprosy on the mental well-being of leprosy-affected persons and their family members—a systematic review. *Glob Mental Health.* **7**: e15.
 14. van Dorst MM, van Netten WJ, Waltz MM et al (2020). Depression and mental wellbeing in people affected by leprosy in southern Nepal. *Glob Health Action.* **13(1)**: 1815275.
 15. World Health Organization (2023). Factsheet on Depressive disorders (Depression). WHO, Geneva, WHO/SEA/2023.
 16. van 't Noordende AT, Korfage IJ, Lisam S et al (2019). The role of perceptions and knowledge of leprosy in the elimination of leprosy: A baseline study in Fatehpur district, northern India. *PLoS Negl Trop Dis.* **13(4)**: e0007302.

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