Original Article

A Cross-Sectional Study of Depression in the Adult Leprosy Patients Attending Out-patient Department of a Leprosy Hospital in the State of Uttar Pradesh in India

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The long-term outcomes of the Hansen's disease are linked to impairment and stigma which includes major impact on mental health. Numerous psychiatric morbidities have been reported among the affected adults among which the one is depression. Alongside mental health problems, stigmatization is closely related to the condition. Our study aimed to quantify the depression and its associated factors among the adult leprosy patients attending OPD of TLM Hospital, Faizabad. This cross-sectional study was conducted in outpatient department of TLM Hospital Faizabad (Uttar Pradesh, India), from February 2023 to April 2023 and comprised of 204 participants. The information on various variables was collected using structured questionnaire, SARI scale to assess stigma related to leprosy, PHQ-9 to measure depression following which analysis was conducted. 32% of the participants were found to be positive for depression. Severe depression, moderately severe depression and moderate depression were seen in 3.9%, 7.3% and 20.5% of the participants respectively. Visible deformity and encountering high stigma showed an independent association with depression. It can be concluded that prevention of visible deformity by early screening and health education, rehabilitation, palliative care and counselling of stigmatized patients would be a better approach to tackle this situation.

Keywords: Leprosy, Depression, Stigma, Disability, PHQ-9, Uttar Pradesh, India

Introduction

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*. It affects mainly the skin, eyes, upper respiratory tract mucosa and peripheral nerves. Most commonly it transmits through droplets from the nose and mouth of infected person and can result in permanent damage to the mentioned areas if left untreated.

Although it is a curable disease, case detection and treatment with multidrug therapy (MDT) alone have proven insufficient to effectively block disease transmission (WHO 2023). There are well known physical consequences of leprosy such as crippling of hands and feet, patches, paralysis and blindness (CDC). However, chronic consequences such as impaired mental health

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and stigmatization have not been taken into the account due to scarcity of data and standard data collection methods (Somar et al 2020). In the developing countries, usually mental health has not been given priority and itself associated with stigma (Prince et al 2007), and the person who is affected with leprosy encounters dual difficulty of coping with infectious disease as well as mental health issues such as depression. India has achieved to the stage where leprosy is eliminated as a public health problem i.e., prevalence of <1/10,000 population (Rao & Suneetha 2018). Despite such success over years, the fact cannot be changed that India still accounts for 60% of fresh cases globally and unfortunately, it's among 22 "global priority countries".

Olivier (1987) emphasized on implications of psychiatric diagnosis and treatment. Mental health care of persons affected with leprosy, managing the discrimination and reducing social stigma looks necessary to ameliorate the mental health status of people affected by leprosy (Tsutsumi et al 2004).

A study on migrated leprosy patients found that 14% of the participants had moderate to severe depression and one out of five patients showing depression symptoms had attempted to suicide (Soni et al 2018). A study in Ethiopia reports that overall prevalence of mental distress is 34.6% and the mental distress among leprosy patients is significantly higher as compared to the patients with other dermatological problems (Leekassa et al 2004). The stigma associated with leprosy also causes psychological problems in both the patients as well as community (Baconcini 1990).

In India, the prevalence of depression among the leprosy affected individuals in a multi-centric study was found to be 33%. (Govindasamy et al 2021). However, the state specific prevalence in Uttar Pradesh is still unknown. Studies suggest that leprosy is quite far from eradication in India and there is a need for improved mental

healthcare for persons affected by leprosy. But due to lack of recognition and available data about it, these issues are not being addressed. Still there is a need of adequate evidence to corroborate this effect globally on burden of mental health disorders and treatment needs of population inhabiting with leprosy for minimization of impact. Therefore, assessment of depression and risk factors are needed to improve the quality of life of persons affected by leprosy (PALs), reduce stigma and address connected social issues.

Materials and Methods

This hospital-based cross-sectional study conducted at The Leprosy Mission Hospital Faizabad, Ayodhya, Uttar Pradesh from February 2023 to April 2023. It is a 30 bedded hospital that offers medical specialities such as medicine, reconstructive surgery, physiotherapy, dermatology and counselling therapy. The hospital is well known for leprosy management hence patients approach by themselves and also by referral from healthcare centres from nearby blocks and districts such as Sultanpur, Gonda, Basti and Bahraich. The diagnosis through clinical symptoms and slit skin smear was made available and clinical profile was updated into electronic system by a medical staff. The leprosy was classified based on Ridley-Jopling classification (Ridley & Jopling 1966). Adult patients already diagnosed with leprosy coming for follow-up in outpatient department were approached for participation. Participant were then consented and interviewed. If a patient declined to participate, the next patient was approached. The process of data collection was initiated after obtaining a written informed consent from the participant and an attendant.

Structured questionnaire forms were used to note the individual details by verbal response. Clinical profile was recorded from electronic system. Stigma Assessment and Reduction of Impact (SARI) scale (Dadun et al 2017) was administered

and filled by interviewer which was used to assess stigma which consisted of 21 questions and scored as 'rarely' (1), 'sometimes' (2) or 'always' (3). The scores were then added. The maximum score of 'rarely' response is considered as a cut-off i.e. 21. The scores above that cut-off were considered as 'high stigma' and the scores upto and below that cut-off was considered as 'low stigma'. Patient Health Questionnaire-9 (PHQ-9) (Bhardwaj et al 2023) was filled by participants which had 9 questions that scored as "not at all" (0), "several days" (1), "more than half the days" (2) or "nearly every day (3). A total score was calculated with cut-offs classifying severity.

Table 1 : General information of study population.

Variables	Category	N	%
Age category in years	18-30	73	35.8
	31-40	28	13.7
	41-50	35	17.2
	51-60	36	17.6
	61-70	20	9.8
	71-80	12	5.9
Sex	Male	151	74
	Female	53	26
Education level	Illiterate	67	32.8
	Primary school	22	10.8
	Middle school	24	11.8
	High school	34	16.7
	Intermediate	34	16.7
	Graduation	19	9.3
	Post-graduation	4	2
Occupation	Professional	3	1.4
	Semi-professional	3	1.4
	Agriculture/small business	53	25.9
	Skilled	14	6.8
	Semi-skilled	14	6.8
	Unskilled	23	11.3
	Unemployed	63	30.9
	Homemaker	31	15.2
Socioeconomic status	Lower	67	32.8
	Lower-middle	62	30.4
	Middle	53	26
	Upper-middle	14	6.9
	Upper	8	3.9

A score of 10 and above was considered as depression. In case the participant was illiterate or unable to read, the questions of PHQ-9 were asked and filled by principal investigator.

The data was analysed according to age, sex, education, occupation, socioeconomic status, leprosy type, disability grade as per WHO criteria (Brandsma & van Brakel 2003), treatment status, chronic medical illness, reconstructive surgery and stigma.

Results

A total of 204 participants were interviewed over the period of two months. Their demographic characteristics are shown in Table 1. The mean age of participants was 41.67(±17.6). The majority (35.8%) of the participants belonged to the age group of 18 to 30 years. Males were nearly three-fourth (74%) among all the participants. Nearly one-third of the participants were illiterate. Merely 16.7% had studied up

Table 2 : Distribution of clinical profile of adult leprosy patients.

Variables	Category	N	%
Leprosy type	TT	0	0
	BT	136	66.7
	BB	0	0
	BL	22	10.8
	LL	26	12.7
	Unspecified	20	9.8
WHO disability grade	Grade II	80	39
	Grade I	47	23
	Grade 0	77	38
Treatment status	Completed treatment	100	49
	Under treatment	104	51
Chronic medical illness	Present	20	10
	Absent	184	90
Reconstructive surgery	Yes	23	11
	No	181	89

Table 3 : Frequency table of obtained PHQ-9 scores.

Status of depression (As per PHQ 9 score)	Frequency (%)
Severe depression (20-27)	8 (3.9%)
Moderately severe depression (15-19)	15 (7.3%)
Moderate depression (10-14)	42 (20.5%)
No depression (below 10)	139 (68.1%)
TOTAL	204 (100%)

to intermediate level of schooling. The most common occupation was found to be agriculture (25.9 %). Also, 30.9% of the participants were unemployed. Only 1.4% of the participants were professional workers. Near about two-third of the participant economically falls in lower to lower-middle socioeconomic status.

Classification of leprosy types as per Ridley &

Table 4 : Association of various socio-demographic factors, clinical profile and stigma with depression.

Variables	Category	Depression					Chi Square P Value	Crude Odds Ratio (95% C.I.)	Chi Square P Value	Adjusted Odds Ratio (95% C.I.)
		Present		Absent		TOTAL				
		No	%	No	%					
Age (in years)	42-80	33	32.7	68	67.3	101	0.80	1.07(0.59-1.94)		
	18-41	32	31.1	71	68.9	103		1		
Sex	Female	20	37.7	33	62.3	53	0.28	1.42(0.74-2.75)		
	Male	45	29.8	106	70.2	151		1		
Occupation category	Unemployed /Homemaker	33	35.1	61	64.9	94	0.35	1.31(0.73-2.38)		
	Employed	32	29.1	78	70.9	110		1		
Socio-economic status	Lower-middle/lower	41	31.8	88	68.2	129	0.97	0.99(0.53-1.82)		
	Middle and above	24	32	51	68	75		1		
Leprosy Type	Tuberculoid	46	33.8	90	66.2	136	0.39	1.37(0.66-2.85)		
	Lepromatous	13	27.1	35	72.9	48		1		
WHO Disability Grade (Visible deformity)	Grade II (VD)	32	40	48	60	80	**0.04**	**1.83(1.01-3.34)**	**0.006**	**2.71(1.33-5.51)**
	Grade I/0 (No VD)	33	26.6	91	73.4	124		**1**		**1**
Treatment Status	Completed Treatment	36	36	64	64	100	0.21	1.45(0.80-2.62)		
	Under Treatment	29	27.9	75	72.1	104		1		
Chronic Medical Illness	Present	9	45	11	55	20	0.18	1.87(0.73-4.76)		
	Absent	56	30.4	128	69.6	184		1		
Reconstructive Surgery	No	56	30.9	125	69.1	181	0.42	0.69(0.28-1.70)		
	Yes	9	39.1	14	60.9	23		1		
Stigma	High (22 and above)	21	61.8	13	38.2	34	**<0.001**	**4.62(2.13-10.01)**	**<0.001**	**6.80(2.86-16.18)**
	Low (21 and below)	44	25.9	126	74.1	170		**1**		

Jopling (1966), WHO disability grading (Brandsma & van Brakel 2003) and other clinical information is summarised in Table 2. Two-third of the participants had Borderline Tuberculoid (BT) type of leprosy. 12.7% were labelled in the category of Lepromatous Leprosy (LL). Also, unspecified leprosy was seen in 9.8% of the participants. Grade II disability was observed among 39% of the participants. Almost equal number of participants were present in both under treatment and completed treatment categories. 10 % of the participants had some form of chronic medical illness. 11 % of the participants had undergone reconstructive surgery for correction of deformity at some point of time in their lives.

As shown in the Table 3, 65 participants out of 204 were found to be depressed based on obtained PHQ-9 scores. Therefore, 32% of the participants were screened positive for depression. More specifically, severe depression, moderately severe depression and moderate depression were seen in 3.9%, 7.3% and 20.5% of the participants respectively.

Table 4 shows that Odds of having depression among leprosy patients with visible deformity (WHO disability grade II) is 1.83 (95% C.I. 1.01-3.34) times higher than leprosy patients with no visible deformity. High stigma is positively associated with depression. Those who encountered higher stigma were at 4.62 (95% C.I. 2.13-10.01) times higher chance of developing depression than those with low stigma.

Multivariate model was formed after including all the significant independent variables from bivariate analysis such as visible deformity and stigma as well as potential confounding socio-demographic factors such as age category, sex and occupation category. After adjusting for all the confounders in the multivariate analysis, presence of visible deformity (WHO disability grade II) AoR, 2.71 (95% C.I. 1.33-5.51) and high stigma AoR, 6.80 (95% C.I. 2.86-16.18) were found to be statistically significant risk factors of depression.

Discussion

Most of our respondents were male, married, and unemployed. This is because early marriage is common in eastern Uttar Pradesh and the reason for more unemployed respondents was presence of participants (35.8%) that majorly belonged to 18-30 years of age group. Also, students were included in unemployed category. The under-representation of female participants in the treatment facility might be due to patriarchal social arrangements which we can find in many parts of the country (Iyer et al 2007). Another reason backing it can be women's dependent choice to seek health care services and lack of awareness for medical facilities (Reddy et al 2020).

Individuals with agricultural background and those who were unemployed constituted the major portion of participants. The reason for that is the Leprosy Mission Hospital, Faizabad's location in Motinagar, Masodha block which is rural area and primary occupation in the nearby areas is farming.

Depression among leprosy affected individuals have a varied presentation and the burden also differs geographically. The depression among leprosy patients in this study is similar to what a multi-centric study found in four states of India (Govindasamy et al 2021). However, majority of authors from India and other countries found the prevalence much higher compared to our study finding (Mangeard-Lourme et al 2020, Roberts et al 2022). Further, selected studies globally had also observed a comparatively lower prevalence of 24.6%, 25% and 12.6%, respectively (Sharma et al 2022, Su et al 2012, van Dorst et al 2020). It is understood that these percentages will be influenced by sampling and socio-cultural conditions prevailing in a particular social group at a given point of time.

Particularly looking to the area where we conducted our research, a study in 2018 found that prevalence of depression among children in eastern Uttar Pradesh as 14.5% (Mishra et al 2018). A global burden of disease study (1990-2017) measured the burden of mental disorders across the states of India and found the prevalence of depressive disorders in state as <2.75% which was one of the lowest among all the states (Sagar et al 2020). Even during the disastrous COVID-19 pandemic, the prevalence of depression in Ghaziabad (Uttar Pradesh) was found to be 25% which is still low compared to what we found among leprosy affected individuals (Singh et al 2022).

The present study showed that presence of visible deformity (WHO disability grade II) is a statistically significant (AoR, 2.71) risk factor for depression. The results are comparable with many studies (Bharath et al 1997, Kisivuli et al 2005, Kumar & Verghese 1980, Verma & Gautam 1994). Increased risk of mental distress and low quality of life due to physical impairments has been shown in some studies(Leekassa et al., 2004; Parashar & Kumar 2015; Verghese et al 1971, Tsutsumi et al 2007). The association of visible deformity with depression again goes hand in hand with a study which shows burden of depression among visibly impaired leprosy affected as 90% compared to 47% among unimpaired (Verma & Gautam 1994).

Our study came to a finding that adult leprosy patients who encountered higher stigma are at 6.8 times higher risk of depression. This association in our study agrees with a recent study done in Nepal which claimed leprosy related stigma as a significant correlate for anxiety and depression (Tolentino & Schmidt 2018). Other studies also conclude that stigma can increase mental distress, depression, and fear (Bharath et al 1997, Brouwers et al 2011, Sillo et al 2016, Thwaites et al 2014).

Stigma is found to be a risk factor for negative mental health outcomes. It causes delay in seeking and continuing treatment. It also increases tendency to suicide and can prolong the duration of untreated illness leading to disability (McGlashan 2006).

Community health workers in eastern Uttar Pradesh should be given comprehensive teaching and practical understanding of the various aspects of mental health care among leprosy patients. It will help to improve awareness about psychiatric illness and the importance of prevention among community workers which will subsequently benefit the leprosy affected individuals and their families. More rigorous training of the public health providers and primary healthcare physicians is required regarding depression and its management in leprosy population. Both health care provider delay and patient delay can lead to disability followed by depression, hence there is a need for early screening and implementation of effective preventive strategies like door-to-door monitoring of leprosy and mental health status in the vulnerable population. Mental health research among leprosy population should be encouraged by providing more funding opportunities by the government, and research institutions. Advanced epidemiological research like cohort studies and case-control studies are required to be conducted among the leprosy patients to get a better understanding of new cases and causal association of depression. Qualitative studies can help to gather more detailed information about the possible reasons for depression occurrence.

Limitations of the study

Since the study was conducted in a hospital settings, the group of patients included in the study may or may not be the representative of the actual leprosy affected population in the general community. The scale used in the study is limited to the screening of depression and not

the confirmatory tool for diagnosis of depression. A final diagnosis can only be made after a detailed examination by the clinician.

Conclusions and way forward

From the study, it can be concluded that the presence of depression among leprosy patients is a cause of concern as moderate to severe depression was seen among sizeable proportion of the participants. However, the condition can still be controlled with proper care and management. The analysis of the data suggested that visible deformity (WHO disability grade II) and high stigma were independent predictors of depression among patients. The factors associated with depression among leprosy patients such as disability is non-modifiable. Therefore, prevention of disability by early screening and health education, rehabilitation among already disabled, palliative care among chronic cases and counselling of stigmatized patients would be a better approach to tackle this situation.

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