

A study on Depression using PHQ9 among Patients Attending Outpatient Department of a Tertiary Care Leprosy Hospital in the City of Kolkata, West Bengal

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The consequences of leprosy are often disability and impairments. The physical health ramifications that are evident in the studies, as well as the stigma attached to the disease have implications for a person's mental health. Depression, among other mental health issues, are frequent among persons with leprosy. This study aims to assess the burden of depression among patients suffering from the consequences of Leprosy (Disability) and its association with demographic and clinical factors. The study was conducted in the Premananda Memorial Leprosy Hospital in Kolkata, West Bengal. During the period of study, 99 consecutive patients aged 18 years and above attending the outpatient clinic were assessed for depression using Patient Health Questionnaire-9 (PHQ-9). The questionnaires were administered in the patient's language, either in Bengali or Hindi. PHQ-9 is a validated tool to screen for depression that carries nine questions, each with a score of 3. The clinician had administered the questionnaire. Descriptive statistics were used to report the findings, and multivariate linear regression was applied to study the association between depression and other factors. The burden of depression among these 99 leprosy patients attending Tertiary Care Hospital as screened with the PHQ9 was about 53.5%. People with grade 1 and grade 2 disabilities had 2.6% and 5.6% more chances of developing signs of mental ill-health than those without any disability. The duration of disease and levels of disability were observed to have a strong positive relation with depression among persons with leprosy. There is a need for effective counselling services at Tertiary care centres for reducing the psychosocial consequences.

Keywords : Leprosy, Mental Health, Depression, PHQ-9, Disability

Introduction

Leprosy or Hansen's disease is a neglected tropical disease (WHO 2020). The infection is chronic, caused by *Mycobacterium leprae* bacillus. The bacteria primarily affect peripheral nerves and skin, but other parts have also been the site of

infection (Walker & Lockwood 2007, Graham et al 2010, Polycarpou et al 2013). The manifestation of bacteria in the skin has dermal consequences. However, nerve infection produces axonal dysfunction and demyelination that leads to sensory loss. The sensory loss of peripheral

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nerve causally links to impairment and disability (Graham et al 2010, Britton & Lockwood 2004). Although Multi Drug Therapy (MDT) has made possibilities in the disease's treatment history, the consequences of complexities have not been eliminated. The disability and deformities are residual even after treatment (Wilder-Smith & Van Brakel 2008).

The stigma attached to the disease has wide psychosocial consequences. Along with stigma, the disability and deformities attached to the disease result in social isolation, reduced participation, low self-esteem, and discrimination. In such conditions, persons with leprosy become physically and economically dependent on others. It can also translate into other social issues like divorce (Eidarus et al 1993) where there could be community pressure to divorce the afflicted person (Raju & Reddy 1995). These factors along with other social factors collectively cause mental health issues among persons with leprosy. The common mental health issues are depression, anxiety, psychosexual disorders and suicide (attempts). The most frequently identified psychiatric condition among leprosy patients is depression (Somar et al 2020). The burden of depression among patients with leprosy varies from 8.1% (Kumar & Verghese 1980) to 33% in India (Govindasamy et al 2021). Several studies published in the past from countries worldwide show anxiety and depression between 40 to 80 per cent. Despite studies showing mental health issues among people affected by leprosy, their management is yet to be addressed adequately. In order to add more evidence to literature and to specifically study depression among people affected by leprosy in a metropolitan locality, in a tertiary level setting, this study was conducted in the outpatient department of a tertiary care Urban Hospital in the city of Kolkata, West Bengal.

Methodology

All consecutive patients diagnosed with leprosy attending the outpatient department of Premananda Memorial Leprosy Hospital (Kolkata) between January- March 2018 were screened for depression using the PHQ9. Men and women above the age of 18 years attending the outpatient department were included in the study and only children and adolescents were excluded. The demographic and clinical details were obtained from the medical records and verified during the interview with the study participants. The clinical data collected included type of leprosy, MDT status, disability level at diagnosis, (Eyes, Hands, Feet) EHF score at diagnosis, disease duration (detection delay), and reaction and neuritis.

The PHQ9 is a standard and validated screening tool for depression available in major languages of India, including Bengali and Hindi (Kroenke et al 2001). It consists of nine questions regarding the patient's feelings in the preceding two weeks;

1. Little interest or pleasure in doing things.
2. Feeling down, depressed, or hopeless.
3. Trouble falling asleep, trouble staying asleep or sleeping too much.
4. Feeling tired or having little energy.
5. Poor appetite or eating too much.
6. Feeling bad about yourself, or feeling you are a failure or feeling that you have let yourself or your family down.
7. Having trouble concentrating on tasks such as reading the newspaper or watching a movie or television.
8. Moving or speaking so slowly that other people have noticed or being restless, unable to keep still and moving around more than usual.
9. Thoughts that it would be better if you were dead or thoughts of hurting yourself in some way.

Each response gets a score out of three. The maximum score is 27 for nine questions. A score is obtained for each of the nine questions, either with the clinician asking questions or filling in the form themselves. A translated version of PHQ 9 was used in the study to screen for depression. The data was analysed in SPSS 20 software. Descriptive statistics was used to describe the demographic and clinical data. Patients with the PHQ9 score of 10 or above were considered as having symptoms of depression and used to study the association with different variables. The univariate and multivariate logistic regression

was carried out to study the association between depression and certain demographic and clinical variables. All variables that were significantly associated with depression at univariate analysis were included in the multivariate analysis. To demonstrate the magnitude of significant variables with the depression dose-response relationship analysis was performed. The p-value of less than 0.05 were considered statistically significant in all tests.

Results

Table 1 shows the characteristics of study

Table 1 : Demographic data

Demography	N and (%) or Mean and (SD)
Mean age in years	44 (17)
Female	19 (19.2%)
Male	80 (80.8%)
Marital status	
Single	24 (24.3%)
Married	71 (71.7%)
Widowed	4 (4%)
Occupation	
Employed	57 (57.6%)
Students	9 (9.31%)
Unemployed	30 (30.3%)
Mean detection delay in months	11 (11)
Treatment status	
Under treatment	32 (32.3%)
Released from Treatment	67 (67.7%)
Disability status at interview	
0	21 (21%)
1	9 (9%)
2	69 (69.7%)
EHF score	
0	21 (21%)
1 to 2	29 (29.3%)
3 and above	49 (49.5%)

Table 2 : PHQ – 9 scores

PHQ 9 scores	Depression level	N (%)
0 – 4	None	23 (23.2)
5 – 9	Mild	23 (23.2)
10 – 14	Moderate	32 (32.3)
15 – 19	Moderately severe	13 (13.1)
20 -27	Severe	8 (8.1)
Total		99 (100)

Table 3 : Univariate and multivariate analysis of factors associated with depression among people with leprosy

Factors	Depression N (%)	Unadjusted Odds ratio (95% CIs)	Adjusted Odds ratio (95% CIs)
Gender			
Female	14/19 (74)	2.9 (1.0 - 8.9)	-
Male	39/80 (49)	1	
Occupation			
Unemployed	23/33 (70)	2.8 (1.1 - 6.7)	0.9 (0.2-3.0)
Employed	30/66 (46)	1	1
Treatment status			
Completed treatment	40/67 (60)	0.5 (0.2-1.1)	
Under treatment	13/32 (41)	1	-
Detection delay			
5 years or more	39/55 (71)	5.2 (2.2 - 12.4)	3.6 (1.2-11.3)
Less than 5 years	14/44 (32)	1	1
Disability			
Grade 1 or 2 disability	48/78 (62)	5.1 (1.7 - 15.4)	4.1 (1.1 - 14.9)
No disability	5/21 (24)	1	1
EHF score			
2 or more	47/76 (62)	4.6 (1.6-13)	
Less than 2	6/23 (26)	1	-
Reaction & neuritis at diagnosis			
Present	8/24 (33)	0.3 (0.1-0.9)	1.0 (0.3-3.8)
Absent	45/75 (60)	1	1
Activity limitation			
Moderate to extreme	11/21 (52)	1 (0.4-2.5)	
No or mild	42/78 (54)	1	-
Participation restriction			
Moderate to extreme	26/36 (72)	3.5 (1.4 - 8.4)	3.1 (1.03 - 9.9)
No or mild	27/63 (43)	1	1

Table 4 : Association between EHF score and depression

	Depression N (%)	No depression N (%)	Odds ratio (95% CIs)
0	5 (24)	16 (76)	1
1 to 2	17 (59)	12 (41)	4.5 (1.3-15.8)
3 to 6	21 (64)	12 (36)	5.6 (1.6-19.2)
> 6	10 (63)	6 (37)	5.3 (1.3 - 22.2)
Total	53 (53.5)	46 (46.5)	-

Table 5 : Association between duration of disease and depression

	Depression N (%)	No depression N (%)	Odds ratio (95% CIs)
1 year or less	2 (33)	4 (66)	1
2 to 3 years	8 (29)	20 (71)	0.8 (0.1 - 5.3)
4 to 6 years	8 (47)	9 (53)	1.8 (0.3 - 12.5)
7 to 9 years	3 (50)	3 (50)	2.0 (0.2 - 20.6)
10 years and above	32 (76)	10 (24)	6.4 (1 – 40)

participants. A total of 99 patients with leprosy attending the outpatient department, were included in the study. The mean age of the respondents was 44 years and our sample consisted predominantly of male (80.8%) participants. The majority of respondents were married (71.7%) and had completed their MDT treatment (67.7%). Among our respondents, 69.7% had grade 2 disability.

Table 2 shows the presence and severity of depression as per the PHQ9 scoring. Overall, 53.5% of patients were screened to have depression (moderate to severe category) when the cut-off value of score 10 was used. Of all patients 23.2%, 32.3%, 13.1%, and 8.1% of patients showed mild, moderate, moderately severe and severe depression respectively.

In univariate analysis variables, gender, employment status, duration of illness, presence of disability, EHF score, presence of reaction and/or neuritis at diagnosis and participation restriction level were included to study the association with the presence of moderate to severe depression.

In the multivariate analysis, we included all variables that were found to be associated with depression in the univariate analysis (except EHF score as this variable is a product of presence of disability) and adjusted for gender, age, and activity limitation score. After adjusting for all the variables, duration of disease, presence of disability and those experiencing moderate to extreme restriction were independently associated with the presence of moderate to severe depression ($R^2 = 0.356$) (Table 3).

Table 4 shows the strength of association between varying levels of disability and the presence of symptoms of depression. As the EHF score increased, the odds of developing symptoms of depression increased.

Table 5 shows the strength of association between the duration of disease and the presence of symptoms of depression. As the course of the disease increased, the odds of developing symptoms of depression increased steadily.

Discussion

Most of the respondents were male (80.8%), married (71%), and employed (57.6%). This trend of male respondents dominating the study sample is similar to other urban and tertiary hospital-based studies (Rizvi et al 2015, Soomro et al 2008, Jindal et al 2009). In studies by Arora et al (2008) and Hussein et al (2010), male to female ratios as high as 3.4:1 and 3:1 have been reported respectively. The under-representation of females in the treatment facility may be due to negligence of women health in the family due to patriarchal social arrangements which is seen in many parts of India (Iyer et al 2007). This may also be due to women being reluctant to seek health care services for stigmatised diseases like leprosy (Lockwood 2010).

Most of the respondents in our study had completed their MDT (67.7%). Majority of them had grade 2 disability, i.e., visible impairments (69.7%) and almost half of them had an EHF score of 3 and above (49.5%). The patients that seek treatment in our tertiary level hospital generally are with complicated conditions and many are referred from other primary and secondary hospitals for further management. Notably, the mean delay in detection was 11 months among study participants. This probably

explains the higher disability status of most of the respondents.

Burden of depression

The burden of moderate to severe depression among the leprosy affected was 53.5%, as screened by the PHQ9. This finding is considerably higher than that of the general population, both global and Indian, which is between 4.4% and 4.7%, respectively (Baxter et al 2016). But our findings are consistent with those of Bow-Bertrand et al (2019), who assessed depression among the leprosy affected in Bangladesh and identified that 53% of their participants had signs of moderate to severe depression as screened on the PHQ9. However, one of the limitations of that study was its small sample size. The higher depression burden in our study may be due to the majority of our study participants having a higher disability status which would significantly impact their mental health (Govindasamy et al 2021). Nevertheless, there is ample evidence pointing to the need of adequate mental health services for those who are affected by leprosy and the need to routinely assess patients and refer appropriately.

Though other studies have shown that there is a higher prevalence of depression among female respondents as compared to men (Govindasamy et al 2021, Bow-Bertrand et al 2019) our study did not identify any difference in depression burden between genders. This may be due to the our relatively smaller number of females in the study. However, the authors agree that women in patriarchal societies are often deprived of their voices (The World Bank 2014). Other studies show that women suffering with leprosy are prone to increased economic dependence on others, which influences their mental health (Baxter et al 2016, Patel et al 2006). Women are marginalized based on their gender, their disability due to the

illness and the stigma associated with the illness. Women, therefore, require increased access to healthcare services, especially to mental health services because they are more vulnerable.

Factors associated with depression in leprosy

This study found that certain factors such as 5 years or more detection delay 3.6 (95% CIs, 1.2-11.3) was associated with depression. A delay in the detection and treatment of leprosy can lead to the development of disfiguring and irreversible deformities and these inevitably cause the affected individual to experience significant stigma and poor social participation. Apart from the psychological impact, disabilities and complications like reactions and neuritis can adversely affect day to day functioning and contribute to decreased quality of life.

The disability adjusted odds ratio of 4.1 (95% CIs, 1.1 - 14.9), were significantly associated with depression. The burden of depression increased as severity of disability increased as measured using EHF score. Reis et al (2014), found that there is a higher prevalence of psychological distress in leprosy patients who have higher disability levels, and our study findings are consistent with theirs. Leprosy is a chronic illness, and many patients continue to experience the debilitating consequences of the disease, especially when diagnosed and treated late. Therefore, it is crucial to identify and treat leprosy early so that disability can be prevented, which can also reduce the stigma created by visible impairments. Our study also found that depression was associated with restriction in social participation, 3.1 (95% CIs, 1.03 - 9.9). Since majority of our study participants (69.7%) had a grade 2 disability score, it can be assumed that their social participation would have been negatively impacted. Since this is a cross-sectional study it is difficult to infer the causal

effect of participant restriction leading to depression.

Disability and depression (2D) resulting from leprosy are both preventable physical and mental health ramifications. Early detection and treatment of psychiatric disorders in the integrated health care strategy will reduce the case burden (Singh 2012). The integrated health care strategy would include counselling services at the tertiary health care facilities. It could also have medical social workers who help refer patients to other suitable facilities like rehabilitation and family counselling to reduce divorce or training centres for job opportunities. The need for holistic rehabilitative facilities in case of severity of depression and disability among the patients with leprosy needs to be considered and included in integrated health care. The Global Leprosy Strategy 2021–2030, “Towards zero leprosy”, has also advocated the integrated strategy to achieve the goal of zero leprosy cases and prevent new disability and stigma related psychosocial consequences. The strategy developed is significant for Sustainable Development Goals (SDGs) to leave no one behind and reach the furthest first (WHO 2021). Along with disability and stigma, the persons affected with leprosy have been left behind. Health care facilities will have to integrate services to prevent adverse consequences and reduce the leprosy case burden.

Limitations of the study

Since the study was conducted in a tertiary care hospital, the group of patients included in the study are most likely not representative of the leprosy population in the general community. This could be the reason for high depression levels in the studied population. Urban centres cater to a lot of migrant population where women have limited access to care; also, the sample size

was relatively small. These could be the reason of high male to female ratio. Another limitation is that the study did not exclude the presence of other co-morbid illnesses like diabetes and hypertension which may have impacted the development of depression symptoms in these leprosy affected patients.

Conclusion

The study found that 53% per cent of persons with leprosy have depression as screened by the PHQ9. The chances of developing symptoms of depression are higher among those with disability, longer detection delay and those with restriction in social participation. The provision of counselling, medical social workers, rehabilitation services, and palliative care for chronic severe cases are required to reduce the psychosocial ramifications.

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