JOURNAL OF CRITICAL REVIEWS

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

Depressive And Anxiety Disorders In Persons With Locomotor Disability(LD):A Study In A Tertiary Care Hospital In Northern India.

Dr. Krishnendu Mondal[1*], Prof. Adya Shanker Srivastava[2], Prof. Amit Rastogi[3], Ruchi Jaiswal[4]

[1*]Senior Resident psychiatry, GDIMSH(W.B)
[2]Professor in psychiatry, IMS BHU(U.P)
[3]Professor in Orthopedics, IMS BHU(U.P)
[4]Counsellor

Abstract:

- Background : More than a billion people are estimated to live with some form of disability, or about 15% of the world's population. Inability to work as a normal productive member of the society bears a huge psychological distress among disabled individuals.
- Aims: The aim of the study was to find out the prevalence of depression and anxiety in locomotor disabled patients and their relation to their socio-demographic variables.
- Methods: 100 persons who fulfilled the criteria of Loco motor disability were included in the study. Psychiatric evaluation was done as per ICD-10.The severity of morbidity was assessed using rating scales (HAM-D, HAM-D).The severity of loco motor disability was measured as per disability guidelines of Govt. of India. Statistical analysis was done using simple statistical analysis like Chi square test, t- test , p value for significance and correlation coefficient.
- Results: Out of 100 patients 76% were found to have psychiatric illness. . Depressive Episodes was the most common psychiatric illness found in 41% of patients.28% of the patients were found to have Generalized Anxiety disorder 5% had Post Traumatic Stress Disorder. Patients with disability percentage > 70% found to have greater psychiatric morbidity than its counterpart of 40 - 70%.This observation was found to be statistically significant ($P < 0.002$)

Introduction:

The World Health Organization defines **Disability** "*is an umbrella term, covering impairments, activity limitations, and participation restrictions".* According to NSSO 2002(Disabled Persons in India,2002,National Sample Survey Office.) locomotor disability was categorized as following types-1)Deformity of limb. 2)Dysfunctions of joints of limbs. 3)Paralysis. 4)Others(Deformity of body). 5)Loss of Limb. About 45% of the loco motor disability was attributed to deformity of limb, more than 20% to dysfunction of joints of limb, another 15% to paralysis, 10% to any other deformity of body and 8% to loss of limbs. According to the census of India 2011, India has about 26,810,557 persons with disabilities which amount to 2.21 % of the total population .Among different types of disabilities, prevalence of locomotor disability is the highest(20.3%) in the country (61.9% in males and 38.1% in females).(Census of India,2011).

There is prolong evidence that mental health issues causing detrimental effect on physical health. It was well recognised that there were high levels of physical illness and impairment amidst people during prolonged hospitals stays (for example, Pryce et al.,1991). Hazel et al at 1991 observed that people living in the hospital setting more likely experience 'a high degree of physical health care needs' than those living in the community . Among people in medium- to long-stay psychiatric hospitals, those having physical impairments have a poorer mental health outcome (Patrick and Holloway, 1990).There are also some indications that people who are admitted to psychiatric hospitals may already have high levels of physical ill health and impairment. In one study of people admitted to hospital with major depression in Jerusalem, Israel, almost two-thirds were found to have 'concomitant physical illness' (Lerer et al 1999).

Psychiatric illness in patients with locomotor disability include varied areas , prevalence of depression, anxiety, Posttraumatic stress disorder, Generalised Anxiety Disorder are found in literatures imply that there may be significant correlation between the to states of health(Moore et al 2002,2004)but there may be a tendency in research practice to deliberately exclude people with physical impairments if the focus of research is mental health difficulties. (Jeste et al 1996).

In the years, much attention has been paid to the support needs of mental health service users and disabled people with physical impairments. Although, the support needs of individuals who fall into both these categories have been overlooked by providers, practitioners, researchers and organizations of service users and disabled people. Therefore we have insufficient knowledge about how to best support persons with physical impairments who use or might use mental health services. (Begum, 2000).

The aim of the study:

1) To study and evaluate the depression and anxiety in persons with locomotor disability.

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

2) Correlation of severity of psychiatric illness in persons with locomotor disability.

Materials and Method:

The present study was conducted in the department of Psychiatry, Institute of medical sciences, Banaras Hindu University, Varanasi from November 2014 to August 2016.The patients was collected from the OPD of department of Orthopedics and Physiotherapy center of S.S Hospital, IMS, BHU, Varanasi. Informed consent was taken from all the cases, explaining the nature of the study.

The sample of the study consisted of 100 patients who fulfilled the criteria for the definition of locomotor disability as provided by the government of India and were included randomly from the OPD of department of Orthopedics and Department of psychiatry and Physiotherapy center of S.S Hospital, IMS,BHU, Varanasi.

- **INCLUSION CRITERIA:**

1) Informed consent from the patient under study.
2)Age group more than 21year to less than 50 yr.

- **EXCLUSION CRITERIA:**

1)Refuse to provide informed consent.
2)Age group more than 50 year or less than 21 year .
3)Past history of psychiatric illness.
4)Any other significant co-morbid medical illness except that lead to the disability.

Methods:

1)All subjects were interviewed according to a semi structured proform which included sociodemographic details ,history of present illness, history of medical illness and past history of psychiatric illness, family history of psychiatric illness, personal history, premorbidpersonality, Physical and mental status examination. The socioeconomic class were assessed by Kuppuswamy's socioeconomic scale.
2)The patients were assessed for psychiatric morbidities as per the ICD 10 criteria.
3)The severity of psychiatric illness was assessed according to the following scales.
a)Hamilton Anxiety Rating Scale.
b)Hamilton Rating scale for Depression.
4)The severity of physical disability was measured as per Disability Guidelines, Government of India.
5)Statistical analysis

Simple statistical analysis using Chi Square test, T test, P value for significance and correlation coefficient was be used for analysis. The patients were examined for psychiatric comorbidities as per ICD 10 guidelines and severity was measured using relevant rating scales.

Observation and Results:

The following were the observation of the study. Among the study population of 100, 75 were male 25 female. We had 33 persons each among 21 to 30 years and 31 to 40 years age group,34 from 41 to 50 years. 11 were illiterate and 89 literate. Occupation wise 23 were student ,15 persons each were businessman and domestic worker,30 were employees.56 of them were unmarried,44 married. We had 50 persons from joint family and 50 from nuclear family. Most(41) of the persons were from upper lower class family an maximum(58) from rural background. 72 patients were having disability percentage between 40%-70% and 28 beyond 70%. Among the individual causes of disability we had Polio (26),Amputation (15), Arthritis(22), Stroke Paralysis (10), Spinal Cord Injury(12) and Others (15).

Table 1: Sex distribution vs. psychiatric illness in locomotor disability.

s.no.	Age group (in years)		Psychiatric morbidity		N=100 P=0.006
			Absent	Present	
1	Male	n	23	52	75
		%	30.66	69.33	100
2	female	n	1	24	25
		%	4	96	100
	Total		24	76	100

Table 1 suggests that out of the 75 males 52(69.33%) were found to be suffering from psychiatric morbidity. Among females out of the 25 females 24(96%) had psychiatric morbidity. This observation was found to be statistically significant with Pearson's chi-square test with a P value of =0.006.It can be inferred from the results that women are more affected than males with locomotor disability

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

Table 2: Disability percentage vs. psychiatric morbidity.

s.no.	Disability percentage		Psychiatric morbidity		N=100 P=0.002
			Absent	Present	
1	40-70	n	23	49	72
		%	31.94	68.05	100
2	>70	n	1	27	28
		%	0.03	96.42	100
	Total		24	76	100

68.05% patients of disability percentage between 40 to 70 were found to have psychiatric morbidity. Whereas 96.42% patients of disability percentage >70 were suffering from psychiatric morbidity. The differences was statistically significant with P value 0.002.

Table 3: Causes of disability vs. psychiatric morbidity

Sl no	Locomotor disability causes		Psychiatric morbidity		N=100 P=0.047
			Absent	Present	
1	Polio	n	11	15	26
		%	42.30	57.69	100
2	Amputation	n	0	15	15
		%	0	100	100
3	Arthritis	n	4	18	22
		%	18.18	81.81	100
4	Stroke Paralysis	n	2	8	10
		%	20.00	80.00	100
5	Spinal Cord Injury	n	2	10	12
			16.66	83.33	100
6	Others	n	5	10	15
		%	33.33	66.66	100
Total			24	76	100

Among the various groups, polio group had least morbidity(57.69%) while amputation was associated with highest psychiatric morbidity(100%). There seems to be a positive correlation between the causes of disability and presence of psychiatric morbidity as it reached the statistical significance with P value 0.047.

Table 4: Prevalence of psychiatric morbidities.

Sl no	Psychiatric morbidities	Study group (N=100)	
		n	%
1	Nil	24	24.0
2	Depressive Episode	41	41.0
3	Generalized Anxiety Disorder	28	28.0
4	PTSD	5	5.0
5	Others	2	2.0
Table		100	100.0

In this study more than three forth(76%) patients with locomotor disability were found to have psychiatric morbidities. The common psychiatric morbidities found in the study were Depressive Episodes(F32) 41%followed by, Generalized anxiety disorder(F41.1)28%, Post-traumatic stress disorder(F43.1) 5%and others 2%(Unspecified Nonorganic Psychosis[F29] and Other Bipolar Disorder[F31.8] 1% each).

Table 5: Severity of Depressive episode

Depressive Episode	No of patients	Percentage(%)
Mild	2	4.8
Moderate	23	56
Severe	16	39.1
Total	41	100

Among the depressives(41)23 had moderate depression(56%) while 16 had severe depression(39.1%) and only 2 had mild depression(4.8%)

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

Table 6: Age vs. major psychiatric illness

Sl no	Age group (in years)		Psychiatric illness					N=100 P>0.05
			Nil	DE	GAD	PTSD	Others	
1	21-30	n	8	15	8	1	1	33
		%	24.24	45.45	24.24	3.03	3.03	100
2	31-40	n	9	12	9	3	0	33
		%	27.27	36.36	27.27	9.09	0	100
3	41-50	n	7	14	11	1	1	34
		%	20.58	41.17	32.35	2.94	2.94	100
Total			24	41	28	5	2	100

Depression was common in 21 to 30 age group, whereas PTSD was common in 31 to 40 years age group, GAD was higher in 41 to 50 years age group. But these findings failed to reach its statistical significance.

Table 7: Sex distribution vs. major psychiatric morbidities in study

Sl no	Sex		Psychiatric morbidities					N=100 P>0.05
			Nil	DE	GAD	PTSD	Others	
1	Male	n	23	31	15	4	2	75
		%	30.66	41.33	20.00	5.33	2.66	100
2	Female	n	1	10	13	1	0	25
		%	4.00	40.00	52.00	4.00	0	100
Total			24	41	28	5	2	100

From table 6, it is observed that among males more number of males were suffering from depressive episode(41.33%) followed by GAD(20%) and PTSD(2.66%).Among females more number of females suffered from GAD(52%) as compared to depressive episodes(40%).

Table 8: Severity of depressive episode in depressive group.

Sl no	Severity according to Ham-D score	No of patient with DE (n=41)		Ham-D score (Mean+_SD)
		n	%	
1	Mild	2	4.87	11.67+_1.563
2	Moderate	20	48.78	15.57+_1.733
3	Severe	12	29.26	20.56+_1.057
4	Very severe	7	17.07	25.10+_2.334
Total		41	100.0	16.83+_4.985

From table no 8 it is evident that out of the patients suffering from major depressive episode in locomotor disability, nearly half(48.78%) suffered from moderate depressive symptoms while 17.07% had symptoms of very severe depression. Mild depressive symptoms were reported by only 2 patients.

Table 9: Severity of anxiety disorder in GAD group.

Sl no	Severity according to Ham-A score	No of patient with GAD (n=28)		Ham-A score (Mean+_SD)
		N	%	
1	Mild	1	3.57	16.86+_0.705
2	Moderate	17	60.71	19.84+_0.875
3	Severe	10	35.71	25.18+_0.514
Total		28	100.0	19.94+_2.548

60.71% of the patients of locomotor disability with generalized anxiety disorders had moderate anxiety symptoms, 35.71% had severe anxiety symptoms and only 1 person had mild anxiety symptoms respectively.

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

Table 10: Causes of locomotor disability vs. Major psychiatric morbidities

Sl no	Locomotor Disability Causes		Psychiatric Morbidities					
			Nil	DE	GAD	PTSD	Others	N=100 P=0.022
1	Polio	n	11	8	7	0	0	26
		%	42.30	30.76	26.92	0	0	100
2	Amputation	n	0	9	2	3	1	15
		%	0	60.00	13.33	20.00	6.66	100
3	Arthritis	n	4	8	10	0	0	22
		%	18.18	36.36	45.45	0	0	100
4	Stroke Paralysis	n	2	6	2	0	0	10
		%	20.00	60.00	20.00	0	0	100
5	Spinal Cord Injury	n	2	4	3	2	1	12
		%	16.66	33.33	25.00	16.66	8.33	100
6	Others	n	5	6	4	0	0	15
		%	33.33	40.00	26.66	0	0	100
Total			24	41	28	5	2	100

From table no 10, it is evident that causes of locomotor disability has a positive correlation with major psychiatric diagnosis taken in this study. While posttraumatic stress disorder was only found in amputation and spinal cord injury, depression and generalized anxiety disorders was found in all groups. Among these Amputation and Stroke paralysis found to have highest amount of depression(60% each).GAD was found to be highest(45.45%) in arthritis group. This observation is statistically significant with P value 0.022.

Discussion:

A positive relationship between physical illness and depression or psychological distress has been reported persistently (e.g. Kathol and Petty 1981; Langner and Michael 1963; Neff, Husaini, and McCorkel 1980)from the earlier literatures. In our study among the sociodemographic variables(age, sex, domicile, education etc)gender is the only variable that correlates significantly with psychiatric morbidity. The study group contained 75% males and 25% females. In our study 96% of the female population were found to have psychiatric morbidity compared to 69.33% males who have psychiatric morbidity. The study by Darnal et al in 2005 with 1538 amputees found that female sex is significantly associated with higher morbidity. Women with arthritis were prone to have any psychiatric diagnosis more than men reported in some studies(Lok et al al,2010).The same finding has been observed in our study and this correlation reached statistical significance with P value of 0.006.However some studies(Migliorini et al 2008)did not find any significance among gender and some even conferred opposite results(Schönenberg et al 2014).Overall quality of life found to be poorer than male in female polio survivors(Babatunde et al 2012).

The government of India has provided exhaustive guidelines to grade severity of locomotor disability. It can range from 0% to 100%.The higher the percentage the higher the disability. According to the contemporary rules the window of percentage between 40 to 70 % was decided for availing disability benefit in India in education and employment opportunities. Beyond 70% it was assumed that the person could not be able to accommodate oneself into any government institution. In this study a positive correlation was found between the higher the disability percentage greater the psychiatric comorbidity which was statistically significant(P value of 0.002).To our knowledge there is no article in standard journals which attempted to correlate this finding. We propose that due to dual jeopardy ,one is disability itself and second is lack of opportunity for education and employment from government may be behind this observation.

Among the common causes of disability included in this study was Polio(26%), amputation(15%), arthritis(22%), Stroke Paralysis(10%), Spinal Cord Injury (12%) and others(15% including cerebral palsy, malunited fractures, Congenital Talipes Equinovarusetc.).Polio had been found to bear least morbidity(57.69%) while amputation was associated with highest psychiatric morbidity(100%).whereas stroke paralysis, arthritis and spinal cord injury patients had morbidity of 80%,81.8% and 83.3%respectively.A positive correlation between the causes of disability and presence of psychiatric morbidity was found and it reached the statistical significance(P value=0.047).In a study by Malik et al in Rohtak(2012) among 85 posttraumatic amputated patients 67.6% patients had psychiatric symptoms according to ICD-10.In a similar study conducted in Kashmir on amputated patients showed psychiatric morbidity to be 84%(Mansoor et al 2010).Our observation in similar with the previous studies with a higher percentage of morbidity, which may be due to small sample size and younger age ,lower socioeconomic status ,poor family support and coping skills. According to a study by Neilson et al(2006) with Danish cohort patients from 1977 to 1993,it was found that there is 40% increased risk of psychiatric hospitalization among polio patients. In our study polio group has the least psychiatric morbidity. This may be due to the fact that polio patients are more resilient, which mean ability to grow and develop in the face of hardship(Connor et al 2003,Shiri et al 2015)

In this study of 100 locomotor disabled patients 76% were found to have a psychiatric morbidity, although not taking treatment for the illness .Depressive Episodes(F32) was the most common psychiatric illness found in 41% of

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

patients.28% of the patients were found to have Generalized Anxiety disorder(F41.1) , 5% had Post Traumatic Stress Disorder (F43.1) and 2 patients were found to have Unspecified Nonorganic Psychosis(F29) and Other Bipolar Disorder(F31.8).In a systematic review by Suresh Bada Math and Srinivasraju in 2010 showed that in Indian population psychiatric morbidity vary from 0.97% to 37% depending upon the study design, but despite variations in the design of studies, available data from the Indian studies suggests that about 20% of the adult population in the community is affected with one or the other psychiatric disorder. So it can be inferred that among special population like in our study the locomotor disabled the psychiatric morbidity is three and a half time higher than the general population. To our knowledge there no other literature in a standard journal that attempted to correlate locomotor disability as a whole with psychiatric morbidity. On the other hand studies correlating with individual causes of locmotor disability(i.e.amputation ,paralysis) are plethorous.

Depression was more prevalent(45.45%) in the younger age group(21-30 years),(Malik et al 2012,Cheung et al 2003,Fisher et al 1998)PTSD more commonly found in middle age group(31-40 years) 9.09% and GAD(32.35%) in the elderly(41-50 years).This study is with similar results with Bernes et al (2005) which showed anxiety symptoms are more common in older age group and females with disability.

Depression was found to be more common in males(41.33%) compared to females(40%).GAD was prevalent in females(52%) in comparison with males(20%)(Bernes et al 2005).However in a study by El-Meidany et al in 2001 on arthritis patients showed that male outnumbered female in both anxiety and depression. Another study by Migloirini et al in 2008 on Spinal cord Injury patients showed females predominate in both anxiety and depression. Our study which consists of heterogeneous population of different causes of disability(i.e. Polio ,amputation, spinal cord injury, arthritisetc.) may lead to this different point of view.

Among the depressives 56 % were moderately depressed,39.1% were severely depressed and 4.8% were mildly depressed. The mean Hamilton's depression score among the depressives were 16.83+_4.985 and had moderate depression. The mean Hamilton's Anxiety score among the generalized anxiety disorder patients were 19.94+_2.548 and had moderate anxiety symptoms. This study is similar in observation with Malik et al 2012 which found moderate depression and anxiety with amputated patients with the difference that in our study a high number of population was severely depressed.

While depression was found in all causes of locomotor disability it was highest among amputation and stroke paralysis with prevalence of 60% in each. Generalised anxiety disorder was more commonly found in arthritis patient i.e. 45.45%.Post Traumatic stress disorder was only found in amputation and spinal cord injury cases where its prevalence was 20% in each. This observation is statistically significant (P value 0.022).In a recent systemic review levels of depression in post-traumatic amputees showed similar variation with figures of 20.6–63% for depression and 25.45–57% for anxiety.(Mckechnie et al 2014),however an Indian study showed the level of Generalized anxiety disorder about 10% and PTSD 20% among amputees(Mansoor et al 2012).Ayerbe et al in 2013 in a meta-analysis found that prevalence of depression was 29% (95% CI 25–32), and remains stable up to 10 years after stroke, with acumulative incidence of 39–52% within 5 years of stroke.

Conclusion:

Although done in a fewer number of patients this study was a genuine attempt to bring forward the fact that locomotor disability causes significant psychiatric morbidity, This aspect becomes important since only few studies have been undertaken to study the relationship between locomotor disability as a whole with psychiatric morbidity. The studies which were done previously was more among western population. In Indian subcontinent the fewer studies done mainly focuses on individual causes of locomotor disability. This study throws the light on the increased prevalence of significant psychiatric morbidities in patients of locomotor disability. Our study thus urges on the need of further research on this aspect and the need of consultation liaison psychiatry for fulfilling the psychological needs of the patients.

References:

1. "Disability World Report 2011". World Health Organization. 2011. Retrieved January 8, 2015.
2. Census of India. 2011. The First Report on Disability. Registrar General and Census Commissioner, New Delhi, India.
3. Pryce, I.G., Griffiths, R.D., Gentry, R.M., Hughes, I.C., Montague, L.R., Watkins, S.E., Champney-Smith, J. and McLackland, B.M. (1991) 'Thenature and severity of disabilities in long-stay psychiatric in-patients in South Glamorgan', British Journal of Psychiatry, Vol. 158, pp. 817–21
4. Hazel, K.L., Herman, S.E. and Mowbray, C.T. (1991) 'Characteristics of seriously mentally ill adults in a public mental health system', Hospital and Community Psychiatry, Vol. 42, No. 5, pp. 518–25.
5. Patrick, M. and Holloway, F. (1990) 'A two year follow up of new long stay patients in an inner city district general hospital', International Journal of Social Psychiatry, Vol. 36, No. 3, pp. 207–15.
6. Lerer, B., Shapira, B., Bloch, M., Hanin, B., Trudart, T., Alexander, J.R., Popper, M., Braun, D., Segman, R.H. and Ritsner, M. (1999) 'Possible precipitants of psychiatric hospitalisation in patients with major depression: results from the Jerusalem Collaborative Depression Project', Depression and Anxiety, Vol. 9, No. 4, pp. 156–62

ISSN-2394-5125 VOL 7, ISSUE 5, 2020

7. Jeste, D.V., Gladsjo, J.A., Lindamer, L.A. and Lacro, J.P. (1996) 'Medical comorbidity in schizophrenia', Schizophrenia Bulletin, Vol. 22, No. 3, pp. 413–30.
8. Begum, N. (2000) 'Exploring the mental health experiences and support needs of people with physical impairments', research proposal to the Joseph Rowntree Foundation.
9. Kathol, R.G., and F. Petty. 1981. "Relationship of Depression to Medical Illness: a Critical Review." Journal of Affective Disorders 3:111-21.
10. Langer, Thomas S., and Stanley T. Michael. 1963. Life Stress and Mental Health, Vol. 2. London: The Free Press of Glencoe.
11. Neff, James A., Baqar A. Husaini, and James McCorkel. 1980. "Psychiatric and Medical Problems in Rural Communities." Social Science and Medicine 14A:331-36.
12. Darnall BD, Ephraim P, Wegener ST, Dillingham T, Pezzin L, Rossbach P, et al.Depressive symptoms and mental health service utilization among persons with limb loss: results of a national survey. Arch Phys Med Rehabil \2005;86(4):650–8
13. Lok EYC, Mok CC, Cheng CW, Cheung EFC. Prevalence and determinants of psychiatric disorders in patients with rheumatoid arthritis. Psychosomatics 2010;51:338–338.e8.
14. Migliorini C, Tonge B, Taleporos G. Spinal cord injury and mental health. Aust N Zeal J Psych. 2008;42:309–14.
15. Schönenberg, Michael & Martina Reimitz & Aiste Jusyte & Doris Maier & Andreas. Badke & Martin autzingerInt. J. Behav. Med. (2014) 21:169–17.DOI 10.1007/s12529-012-9284-8.
16. Babatunde O.A. Adegoke, Abayomi A. Oni, Caleb A. Gbiri, Christopher O. Akosile, Hong Kong Physiotherapy Journal (2012) 30, 93-98.
17. Malik Prerna, Rajinder Garg, Balwant Singh Sidhu, Kuldip C. Sharma, Anil D. Gulia,(2012)Delhi Psychiatry Journal Vol. 15 No.1, Pp 130-135.
18. Muzaffar Nasir , Imtiaz Mansoor ,Arifa Hafeez ,Mushtaq Margoob (2012)Australasian Journal of Disaster and Trauma Studies, Volume 2012–1,Pp 31-38.
19. Nielsen, N. M., Rostgaard, K., Hjalgrim, H., Askgaard, D., Skinhøj, P., &Aaby, P. (2007 February) Psychiatric Hospitalizations in a Cohort of Danish Polio Patients. American Journal of Epidemiology *165 (3)*, 319-324. doi:10.1093/aje/kwk003
20. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). Depress Anxiety 2003;18:76–82.
21. Shimon Shiri, Irina Gartsman, Zeev Meiner& Isabella Schwartz (2015) Long-standing poliomyelitis and psychological health, Disability and Rehabilitation, 37:24, 2233-2237, DOI: 10.3109/09638288.2015.1019007
22. Math Suresh B, Srinivasaraju R. Indian psychiatric epidemiological studies: learning from the past. Indian J Psychiatry 2010;52(Suppl 1):95–103.
23. Malik Prerna, Rajinder Garg, Balwant Singh Sidhu, Kuldip C. Sharma, Anil D. Gulia,(2012)Delhi Psychiatry Journal Vol. 15 No.1, Pp 130-135.
24. Cheung E, Alvaro R, Colotia V. Psychological distress in workers with traumatic upper or lower limb amputations following industrial injuries. Rehabil Psychol 2003;48:109–12.
25. Fisher K, Hanspal RS. Phantom pain, anxiety, depression, and their relation in consecutive patients with amputated limbs: case reports. BMJ 1998;316:903–4.
26. Brenes GA, Guralnik JM, Williamson J, Fried LP, Penninx B. Correlates of anxiety symptoms in physically disabled older women. American Journal of Geriatric Psychiatry. 2005;13:15–22
27. El-Miedany Yasser M., Amany Haroun El Rasheed(2002)Is anxiety a more common disorder than depression in rheumatoid arthritis? Joint Bone Spine 2002 ; 69 : 300-6
28. Mckechnie P.S., A. John(2014) Anxiety and depression following traumatic limb amputation: A systematic review Injury, Int. J. Care Injured 45 1859–1866
29. Ayerbe Luis, Salma Ayis, Charles D. A. Wolfe and Anthony G. Rudd Natural (2013)history, predictors and outcomes of depression after stroke: systematic review and meta-analysis; The British Journal of Psychiatry 202, 14–21. doi: 10.1192/bjp.bp.111.107664