Functional Impairment and Quality of Life of patients with Major Depressive Disorder in Euthymia

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Abstract

Background: Symptomatic remission has long been the goal of treatment in Major Depressive Disorder. Remission from depression is accompanied by improvements in functioning. Residual symptoms in remission affect their ability to function at work, home, social settings and worsen their quality of life.

Objectives: To assess the level of Functional Impairment and Quality of Life of Major Depressive disorder patients in the euthymic state, determine the association between degree of functional impairment with socio demographic variables and clinical parameters and to compare the functional impairment and quality of life at initial assessment and follow up assessment at three and six months.

Patients and methods: Cross sectional study of one year duration was done in outpatient setting comprising of subjects on treatment for Major Depressive disorder in euthymia (Hamilton depression rating scale score<7). Sociodemographic, clinical data were obtained, functional impairment was measured using Indian Disability Evaluation Assessment Scale and quality of life assessed with WHO-QOL- BREF questionnaire at initial, three and six month follow up. Statistical analysis was done.

Results: 221 subjects were followed up and 19 relapsed and 10 were lost to follow up. Mean IDEAS score was 4.69 and SD 1.67, work and interpersonal activities domain was most affected and mean QOL was 56.67 and SD 4.913 at initial assessment. Age, education and marital status of subjects had significant association with IDEAS score. Duration of illness, number of episodes had a positive correlation and QOL scores had negative correlation with IDEAS score. IDEAS score reduced by an average of 0.401 and QOL scores increased by an average of 4.224 at six months.

Conclusion: Measures of functional impairment provide insight into the total impact of Major Depressive Disorder. Symptomatic remission does not necessarily imply functional recovery. Complete clinical and functional recovery should be the aim of treatment.

Keywords: Functional assessment; Quality of life; Major depressive disorder.

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Introduction

Functional impairment associated with mental illness is a major contributor to the global burden of disease. Depressive disorders were ranked 13th among the top 25 leading causes of Disability-adjusted life years (DALYs) in 2019.At the disorder level, of the top 25 leading causes of Years of healthy life lost due to disability (YLDs) in 2019, depressive disorders were ranked second. Within mental disorders, Major depressive disorder (MDD) ranked the highest in all age groups with the exception of the 0–14-year age category, the leading cause of burden.(**GBD Study, 2019**).This highlighted the burden of disability that occurred secondary to depression. Much of this burden relates to the economic losses suffered when people are depressed and by impairment in their quality of life and relationships. Two constructs, quality of life and functional impairment, have been identified in the literature to capture the positive aspects of health. Quality of Life and Functional Impairment measure different constructs and both are important in better understanding health.(**Murray et al., 1997; Shihabuddeen et al.,2011**).

Quality of Life measures an individual's subjective satisfaction of self-indicated important life domains.(**Murray et al.,1997**).Quality of Life (QOL) is a direct consequence of mental health and is becoming a prime measurement of outcome of therapy. Functional Impairment is defined as the amount of interference caused by specific symptoms or behaviors connected to a disorder and can be assessed with regard to the impact of symptoms on specific domains of life.(**Murray et al.,1997**) It has been demonstrated that in the patients of mood disorders, residual disability and poor quality of life continue even after completion of symptom-linked treatment.(**Frisch et al.,2005**) Remission from depression was accompanied by improvements in functioning, however, compared to the non-depressed individuals significant functional limitations remained. Measures of functional decline can provide insight in the total impact of diseases, such as depression. Remission has been defined as an improvement of sufficient magnitude that the individual is asymptomatic, no longer meets syndrome criteria for the disorder and has no more than minimal symptoms(**Frank et al., 1991**). Definitions of remission are based on validated depression rating scales, as in Hamilton Depression Rating Scale -17 total score ≤ 7. However, patients meeting criteria for remission to continue to experience disabling residual symptoms of depression which in turn affect their ability to function at work, at home, and in social settings**.**(**Zajecka et al.**, **2013**)

The functional impairment of major depressive disorder (MDD) and its association with Quality of Life (QOL) has not been sufficiently studied in Indian literature. Currently there is limited evidence that shows Functional Impairment and QOL in euthymic patients with Major Depressive disorders. Hence, this study has tried to explore the level of functional impairment and QOL of patients with MDD in remission in euthymia. This knowledge would help to improve the treatment outcome and to make use of intervention to improve function as early as possible during treatment. The

current study aimed to assess the level of Functional Impairment and Quality of Life of Major Depressive disorder patients in the euthymic state. Also to determine the association between degree of functional impairment with socio demographic variables and clinical parameters. Additionally to compare the functional impairment and quality of life at initial assessment and follow up assessment at 3 and 6 months.

Patients and methods

Study Setting :This study was conducted in the Department of Psychiatry, Sree Gokulam Medical College, a tertiary care private Medical college in South India.

Study Design: Cross sectional study.

Study Period: The duration of study is 1 year (October 2021 to October 2022).

Study population: Patients fulfilling the DSM-5 criteria for Major depressive disorder on treatment from Department of Psychiatry. Those who have not had an episode for the last 6 months (in remission) and in euthymic state will be assessed in the Outpatient Department (OPD) setting. Convenient sampling was done. The patients satisfying inclusion and exclusion criteria were included in the study.

Inclusion Criteria

1. Patients satisfying DSM-5 criteria of Major Depressive Disorder, on treatment, between age group of 18-60yrs
2. No episode in the last 6 months
3. Euthymic status at the time of assessment (Hamilton Rating Scale for Depression score <7)
4. Those willing to participate after written informed consent

Exclusion Criteria

1. Patients with history of organic brain disease/mental retardation.
2. Patients with history of major physical illness such as malignancy, connective tissue disorders, renal failure, and other disorders that can impair functioning and quality of life.
3. Patients with other comorbid psychiatric illnesses and substance use disorders, except nicotine.
4. Those not willing to participate.

Euthymia is defined as a pleasant state of mind. It can also be explained as a normal mood, where range of emotions are neither depressed nor highly elevated. Euthymic state is operationalized as Hamilton Rating Scale for Depression (HAM-D) score <7.

Institutional ethics committee clearance was obtained prior to study and was done in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Patients were assessed according to their socio demographic variables and clinical parameters. Socio demographic variables include- age, sex, education, occupation, place, socioeconomic status and marital status. Clinical parameters include- age of onset of illness, number episodes/hospitalizations, duration of illness, family history of affective disorders, Deliberate Self Harm (DSH) attempts and family history of suicide and comorbid medical illness.

Tools Used

- **Indian Disability Evaluation Assessment Scale**(IDEAS), was used to assess Functional impairment .This scale was developed by the Rehabilitation Committee of the Indian Psychiatric Society for measuring and quantifying disability in mental disorders. The impairment in Self Care, Interpersonal Activities, Communication and Understanding and Work is assessed. Each item is scored from 0 – 4 (0- no disability, 1 – mild,2- moderate,3- severe,4- profound disability). Global score is calculated by adding score of each item and score for Duration of illness (DOI score- <2 years- + 1, 2-5yrs- + 2, 6-10yrs- + 3, >10yrs- +4). This scale has good internal consistency and construct validity with the Cronbach's alpha >0.7 (0.721).(**Grover et al.,2014**)
- **WHO-QOL- BREF questionnaire**- Malayalam version was used to assess Quality of life. It is a self-administered 26 item scale which measures 4 domains:-Physical health, Psychological health, Environment and Social relationships. Each item is scored from 1-5 with higher scores indicating better QOL in each domain and in total score. The scale was found to be reliable with a Cronbach's alpha of 0.731.Domain sub-scores (D) were calculated as follows:

D1= (6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ;

D2 = Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ; D3 = Q20 + Q21 + Q2

D4 = Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25

The raw score thus obtained are into transformed scores (4-20). The total score is calculated by adding up the transformed scores.(**Health WHOD of M ,1996**)

Patients were evaluated in the OP and the level of functional impairment and Quality of life were assessed and compared. The assessments were done upon follow up in 3 months and 6 months wherein the scales were reapplied and scored.

Hamilton Rating Scale for Depression (HAM-D) was used to assess if study subjects were in euthymic state in remission. It consists of 17 items assessing depression experienced over past 1 week and is clinician administered. A score of 0-7 is considered as remission (**Hamilton,1960**).

Statistical Analysis

The severity of functional impairment and level of quality of life were evaluated at initial visit, 3months and 6months.The data was entered in Microsoft excel spreadsheet and data analysis was done using SPSS software version 16. Qualitative variables were expressed in frequency and percentage whereas, quantitative variables were expressed as mean and standard deviation (SD) or median and inter quartile range (IQR). To study the correlation between the two non-normally distributed variables Spearman's correlation coefficient (r_s)is used and if one of the variable is dichotomous Point biserial correlation (r_{pb})was used. In order to compare the functional impairment and quality of life at initial assessment and with that of follow up assessment at 3 and 6 months one way repeated measure ANOVA was performed

among patients excluding those who relapsed or lost to follow up. For paired comparisons, Bonferroni test was done. P value of < 0.05 was considered as statistically significant.

Results

It was observed that most of the subjects belonged to the age group of 31-45years (40%), were females (46.2%) and had a higher secondary education (38%). Fifty seven percent of the subjects were skilled laborers. Majority of them were married (78.3%) and residing in rural areas (86%).The age of onset of depressive disorder varied among the subjects with mean age of 27 ±7 years and range from 14 to 44 years. Duration of illness ranged from 4 years to 37 years with median duration of 10 years and IQR of 9 years. About 68% had less than 6 episodes of illness. Twenty-one percent of subjects had a history of DSH. There was no reported family history of mental illness in 51.6% of the subjects while 11.3% had family history of DSH and 33% reported comorbid medical illness. At the initial assessment , the functional impairment was assessed using IDEAS Global score mean score of 4.69 ,SD of 1.67 and it was seen that Work was the most affected area with a mean IDEAS score of 0.57 and SD of 0.53, while Self care was least affected. With regard to quality of life, the mean combined QOL score was 56.67± 4.913 with the QOL being best in the Environmental domain and worse in the Physical domain (**Table. 1**).Among the socio demographic variables, there was statistically significant association among age, education and marital status with functional impairment (**Table 2**).

Table 1.Functional impairment and quality of life at initial assessment

Tool	Domains	Mean	SD
WHO-QOL BREF	Physical	13.24	1.380
	Psychological	14.55	1.497
	Social relationship	14.06	1.573
	Environmental	14.82	0.890
	Total	56.67	4.913
IDEAS	Self-care	0.05	0.22
	Inter Personal Activities	0.44	0.50
	Communication & Understanding	0.38	0.49
	Work	0.57	0.53
	Global Score	4.69	1.67

Table 2. Association between IDEAS score and socio demographic variables

Socio demographic variables	N	IDEAS Global Score		t-value	p-value
		Mean	SD		
Gender					
• Male	102	4.69	1.635	0.05	0.96
• Female	119	4.70	1.700		
Age group					
• 18-30	64	3.47	0.975	59.987	<0.0001
• 31-45	89	4.74	1.606		
• 46-60	68	5.78	1.485		
Education					
• Middle school	19	5.05	1.026	6.631	0.001
• High school	83	5.11	2.084		
• Higher secondary	84	4.15	1.227		
• Degree and above	35	4.80	1.431		
Occupationǂ					
• Unemployed	41	4.00	1.000	11.171	0.083
• Unskilled	1	7.00	0.000		
• Semi skilled	8	3.50	4.000		
• Skilled	127	4	4		
• Shop keeper/farmer	38	4.00	2.000		
• Semi professional	3	3.00	0.000		
• Professional	3	7.00	0.000		
Marital status					
• Married	173	4.87	1.742	3.74	<0.0001
• Unmarried/divorced	48	4.06	1.174		
Place of residence					
• Rural	190	4.70	1.706	0.193	0.848
• Urban	31	4.65	1.427		
Socio economic status					
• APL	82	4.63	1.781	0.398	0.691
• BPL	139	4.73	1.601		

ǂ Since parametric assumptions were not followed, median (IQR) and the corresponding non –parametric test Kruskal Wallis test value is reported

As age increases, the mean IDEAS score increases and married people have higher IDEAS score compared to others. Among the clinical parameters, duration of illness and number of episodes had a significant positive correlation with functional impairment (IDEAS score) while family history of mental illness and comorbid medical illness are negatively correlated. It was also seen that number of episodes and duration of illness had a significant positive correlation with all domains of the IDEAS scale(**Table 3)**.It was noted that there was statistically significant negative correlation of Functional impairment with all the domains of Quality of life(**Table.4**). Functional impairment in terms of Interpersonal activities and Work had a moderate negative correlation with all domains of quality of life, while the IDEAS Global score had a strong negative correlation with all domains of QOL. Self care domain of functional impairment had the weakest negative correlation with QOL.

Table 3. Correlation between functional impairment (IDEAS) and clinical parameters

IDEAS	r_s /r_{pb} *	Age of Onset	Illness duration	No. of episodes	DSH‡	Family h/o illness‡	Family h/o DSH‡	Medical illness‡
Self care	r_s /r_{pb}	0.056	0.222	0.310	-0.034	-0.111	0.082	-0.149
	p	0.411	**0.001**	**<0.0001**	0.619	0.099	0.226	0.027
Inter Personal Activities	r_s /r_{pb}	0.006	0.472	0.572	-0.031	-0.293	-0.087	-0.251
	p	0.934	**<0.0001**	**<0.0001**	0.651	**<0.0001**	0.197	**<0.0001**
Communication & Understanding	r_s /r_{pb}	0.129	0.359	0.482	-0.117	-0.211	-0.044	-0.362
	p	0.056	**<0.0001**	**<0.0001**	0.083	0.002	0.514	**<0.0001**
Work	r_s /r_{pb}	-0.251	0.315	0.392	-0.104	-0.408	-0.138	-0.004
	p	**<0.0001**	**<0.0001**	**<0.0001**	0.122	**<0.0001**	0.040	0.954
IDEAS global score	r_s /r_{pb}	-0.003	0.781	0.803	-0.114	-0.389	-0.078	-0.410
	p	0.962	**<0.0001**	**<0.0001**	0.090	**<0.0001**	0.249	**<0.0001**

‡ Point-Biserial correlation is reported; *r_s/r_{pb} = Correlation coefficient

Table 4. Correlation between functional impairment (IDEAS) and QOL

IDEAS \ QOL	*r_s	Physical	Psychological	Social	Environmental	QOL Total
Self care	r_s	-0.323	-0.359	-0.214	-0.351	-0.336
	p	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Interpersonal Activities	r_s	-0.683	-0.607	-0.641	-0.645	-0.705
	p	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Communication& Understanding	r_s	-0.457	-0.451	-0.504	-0.413	-0.500
	p	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Work	r_s	-0.627	-0.629	-0.616	-0.619	-0.655
	p	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
IDEAS Global	r_s	-0.818	-0.771	-0.792	-0.757	-0.855
	p	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

*r_s = Spearman's Correlation coefficient

At three months and six months follow up, the mean QOL score and IDEAS global score were analyzed and it was found that mean QOL score differed significantly between time points ($F(1.437, 274.470)= 51.095$, $p < 0.0001$) (**Figure.1**).

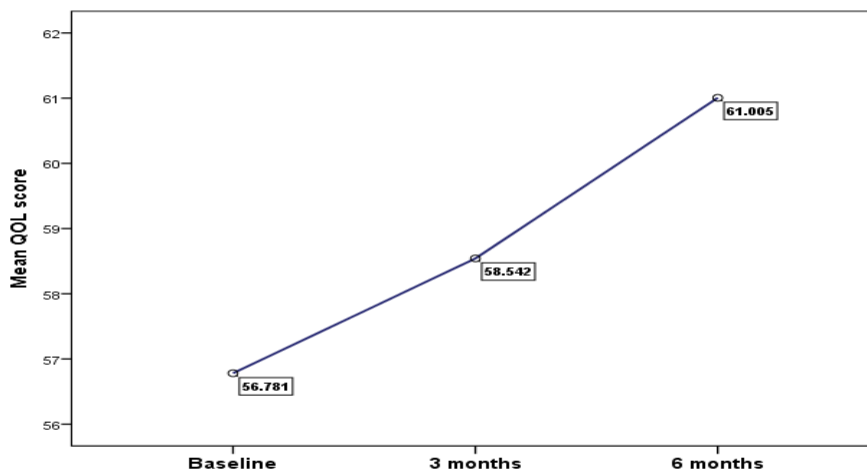

Fig.1. Graph depicting comparison of WHO-QOL total scores at 1, 3 and 6 months

Meanwhile, the IDEAS global score at three months and six months after initial assessment showed a decreasing trend by an average of 0.141 after three months ($p < 0.0001$) and again reduced to 0.401 ($p < 0.0001$) after six months. (**Figure.2**)

This could be due to the longer period of remission which continued at three months and six months follow up, that could have led to improvement in functioning and having a better quality of life.

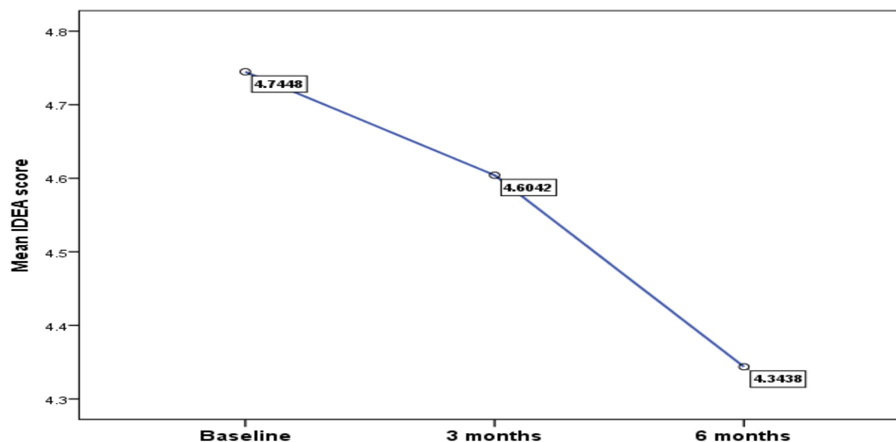

Fig.2. Graph depicting comparison of mean IDEAS scores at 1, 3 and 6 months

Discussion

The main focus of this study was to examine the level of functional impairment and quality of life in subjects with Major Depressive disorder during the period of remission, in euthymia. It also explored the association of the socio demographic variables and clinical parameters with the functional impairment scores. In our study, functional impairment assessed using IDEA global score is decreased by an average of 0.141 after three months ($p < 0.0001$) and again reduced to 0.401 ($p < 0.0001$) after six months which is in accordance with PERFORM 2-year cohort study results where more gradual improvement in functioning was seen during the maintenance phase (2–6 months) in comparison to improvement in acute phase of treatment (**Hammer-Helmich et al ., 2018**)

Work and interpersonal activities were the sub categories under IDEAS which were affected more than other domains in our study. **Collard et al**. (**2018)** in their study found that understanding and communication, participation in society and household activities developed differently over time for the non-remitted participants and the remitted participants. Within the remitted group, higher recovery rates were found in socially oriented domains. These findings indicate even in symptomatic remission, illness directly affects social functioning and delay functional recovery. **Nil et al. (2016)** in their study observed that ≈50% still reported functional deficits among <50% of patients completing a one-

year antidepressant treatment with full symptomatic recovery. Even after symptoms resolve, disability in social interactions can persist and can continue for 3 years after symptoms recover (**Rhebergen et al., 2010),** and this can be attributed to deficits in socio-emotional recognition and regulation, deficits in the empathic response and a lack of nonverbal expression found in Depressive disorder. Our study consisted of subjects who were on treatment ,in remission , whose QOL increased by an average of 1.76 at three months ($p < 0.0001$) and increased by an average of 4.224 ($p < 0.0001$) at six months of follow up. These findings are in concordance with results in study by **IsHak et al.(2015)** in which remitted patients showed a remarkable change in the proportions achieving 'within-normal' QOL scores after treatment and 68% of remitted patients at the end of Level 1 treatment reported 'within normal' QOL which is not markedly different from the proportion expected for the healthy population. In our study , QOL has a negative correlation with functional impairment in all domains. Interpersonal activities and work have moderate negative correlation with all the domains of QOL, whereas IDEA global score has a strong negative correlation with all the QOL domains at initial assessment. **Lu et al.(2017)** in his study found that functional impairment in family life/home responsibilities would lead to a direct reduction in QOL. Quality of life can worsen with persistence of residual depressive symptoms and related functional impairment. (**van der Voort et al.,2015**)

Age, education and marital status were the three variables associated with functional impairment in this study as also seen in study by **Habtamu et al.(2019)**. Functional impairment and disability would increase as one gets older due to reduced social interactions, loss of natural supports, physical illness and reduced independent living. However, findings that higher number of years of education completed and being married were significantly associated with lower functional impairment were in contrast to findings in previous study. This could be explained by the fact that the residual symptoms especially cognitive dysfunction would impair the learning and work efficiency. Being married adds on to the social responsibilities. Among the clinical variables, number of episodes and duration of illness was found to have positive correlation with all the subcategories of IDEAS score which measures the functional impairment. Recurrent episodes may have a negative effect on adaptive function and lead to impairment in functioning (**Park et al.,2019**).

Our study results suggest that even in patients with symptomatic remission, impairment in function with respect to work performance, home management, social activities and interpersonal relationships persist, though the severity of impairment becomes less over time. Even mild depressive symptoms and sub syndromal depression result in functional impairment and reduced quality of life. Functional improvement may begin well after symptoms of depression begin to improve. Treatment objectives in depression should

focus on quantification of functional impairment and monitoring for functional recovery in addition to symptomatic remission.

Conclusion

Assessment of functional impairment and depression symptom rating scales measure different aspects of MDD. Clinicians should use scales for assessment of function in addition to rating scales for symptom severity. Management of depression should be a multistep, ongoing process that includes screening and early diagnosis, evaluating symptoms and functional impairment, selection of treatment, assessing clinical response and treatment adherence and continuing to monitor and assess symptomatic and functional recovery. This would help to bring down the substantial morbidity, mortality, and functional impairment associated with this illness.

Study's limitations

Premorbid personality was not assessed so the coloring of personality on the perception of functional impairment and quality of life could not be excluded. Treatment adherence and details of medications/ psychological intervention were not included in the study.The nature of residual symptoms was not studied. Some of the data, such as the duration of illness, number of episodes or the age at onset, were gathered retrospectively and may, thus, be distorted by recall.

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