

# INTRODUCTION

Psychiatric disorders in neurology are more frequent than verified in routine exam, not only in the less developed but also in large and very developed neurological departments.<sup>(1)</sup> Furthermore, psychiatric symptoms in neurological disorders among primary health care physicians and other specialties are often neglected<sup>(1)</sup> .

A high incidence of psychiatric disorders is found in patients attending neurologists<sup>(2)</sup>. Among new outpatients, the prevalence of all disorders has been estimated at 50%. Mood and anxiety disorders are present in 40% of patients, are associated with greater disability and are persistent<sup>(2)</sup>. So-called "functional" (or psychogenic or hysterical/conversion) symptoms are relatively infrequent in "neurological" conditions, but very often unrecognized and not properly treated<sup>1</sup>. Treatment of psychiatric symptoms in neurology, basically are not different than treatment of these symptoms in psychiatry.

Frequent co-occurrence of psychiatric with neurologic symptoms should come as no surprise, since psychiatric disorders, such as schizophrenia and the mood disorders, can be induced by structural brain disease<sup>(3)</sup>. Presumably, brain dysfunction from conditions that cause neurologic symptoms—such as seizures, and impairments in movement, sensation, speech, or language—also affects areas of the brain that regulate mood, emotion, cognition, and perception. For the most part neuropsychiatry has lain relatively unexplored until experiencing resurgence in the last few decades . More recently, it has been recognized that it is the diseased brain in many instances that causes the psychiatric symptoms<sup>(3)</sup>.

In our study we have made small but solid attempt to observe the prevalence of such psychiatric morbidities/co-morbidities either disorders or symptoms in neurology OPD patients with analysis of sociodemographic profile of such patients and statistical significance of variables to psychiatric conditions.

## REVIEW OF LITERATURE

1. In the similar study of “Psychiatric morbidity in patients attending neurological outpatient department” by Javid Ahmed et al.<sup>(4)</sup> psychiatric morbidity/co-morbidity was common amongst age group of 16-30 years and above 60 years age groups, more common in females<sup>(7)</sup>, more common in illiterates and more common in housewives. Most common neurological diagnosis were migraine and epilepsy and psychiatric co-morbidity was most common amongst them also<sup>(9)</sup>.
2. In the study of Psychiatric comorbidity in patients with headache<sup>(16)</sup> using a short structured clinical interview in a rural neurology clinic in Western India , 49 out of 101 (48.5%) patients with headache suffered from depressive disorders (dysthymia or depression or suicidality), 18 out of 101 patients with headache (17.90%) suffered from anxiety related disorders (generalized anxiety disorder or agoraphobia or social phobia or panic disorder). ( MINI scale used)
3. In the study of Psychiatric Comorbidity in Neurological Disorders in UAE <sup>(39)</sup>, of the total 395 patients, seen individually, 154 (39%) patients showed symptoms of clinical depression, while 137 (34%) patients showed symptoms of generalized anxiety disorder within the clinical range. Of the 140 patients with concurrent symptoms of both disorders. ( PHQ -9 , GAD-7)
4. In the study of Psychiatric Comorbidities and Outcomes in Epilepsy Patients in U.S<sup>(40)</sup>, the most prevalent psychiatric comorbidities present in epilepsy were depression (13%) followed by psychosis (10.4%).

## **STUDY HYPOTHESIS:**

In this study we hypothesize that the patients visiting primarily neurological opd having coexisting psychiatric illness is frequent and often undiagnosed.

## AIMS AND OBJECTIVES

- Estimate prevalence of psychiatric morbidities in patients primarily attending neurology OPD.
- Know the most prevalent of psychiatric co- morbidities in neurological patients in OPD.
- Find relation of specific psychiatric morbidities to specific neurological disease.
- Find relation between age, gender ,occupation , education, marital status , Socioeconomic status and occurrence of psychiatric morbidities or co- morbidities.



# MATERIALS & METHODS

## STUDY DESIGN

### Sample Size: 100

- Type of study : Cross sectional study
- Site of study : Neurology OPD at Civil Hospital, Ahmedabad
- Study duration : May 2019 – September 2020

## SUBJECT SELECTION

**Inclusion criteria:** Consenting the patients and relatives primarily attending the neurology OPD.

**Exclusion criteria:** Unwillingness to participate in the study.

# METHODOLOGY

- The study was approved by the Institutional Ethics Committee, BJ Medical College and Civil Hospital Ahmedabad.
- The samples were collected from out-patient section of Department of neurology.
- Out of 300 patients every 3<sup>rd</sup> patient willing to give consent were included in the study.
- Semi-structured proforma was then filled for each patient.
- Brief psychiatric rating scale 4.0(BPRS) was then applied to each patient.
- Based on the BPRS scoring, participants were divided into groups of pure neurological disorder (no psychiatric symptoms-score 24) and patients with psychiatric morbidity/co-morbidity in form of symptoms or disorder( score more than 24).
- Patients with score more than 24 were interviewed using DSM-V structured clinical interview looking for a particular disorder.
- Data was entered into Microsoft excel data sheet and was analysed using **SPSS 22 version software.**
- Categorical data was represented in the form of Frequencies and proportions. **Chi-square test or Fischer's exact test** (for 2x2 tables only) was used as test of significance for qualitative data.
- **Graphical representation of data:** MS Excel and MS word was used to obtain various types of graphs.
- **P value** (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.



- **Statistical software:** MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data.

## **INSTRUMENTS**

1. **Semi-structured proforma** which was used for recording socio-demographic data, comprising of information about age, sex, marital status, education, occupation, family income, socioeconomic class and locality.

### **2. Brief Psychiatric Rating Scale (BPRS) version 4.0**

This form consists of 24 symptom constructs, each to be rated in a 7-point scale of severity ranging from 'not present' to 'extremely severe' .If a specific symptom is not rated, mark 'NA' (not assessed).

Symptoms/observations include -- Somatic concerns ,Anxiety ,Depression , Suicidality, ,Hostility, Elated mood,Grandiosity , Suspiciousness ,Hallucinations, Unusual thought content ,Bizarre behavior ,Self-neglect , Disorientation , Conceptual disorganization , Blunted affect ,Emotional withdrawal ,Motor retardation ,Tension ,Uncooperativeness, Excitement , Distractibility ,Motor hyperactivity , Mannerisms and posturing.



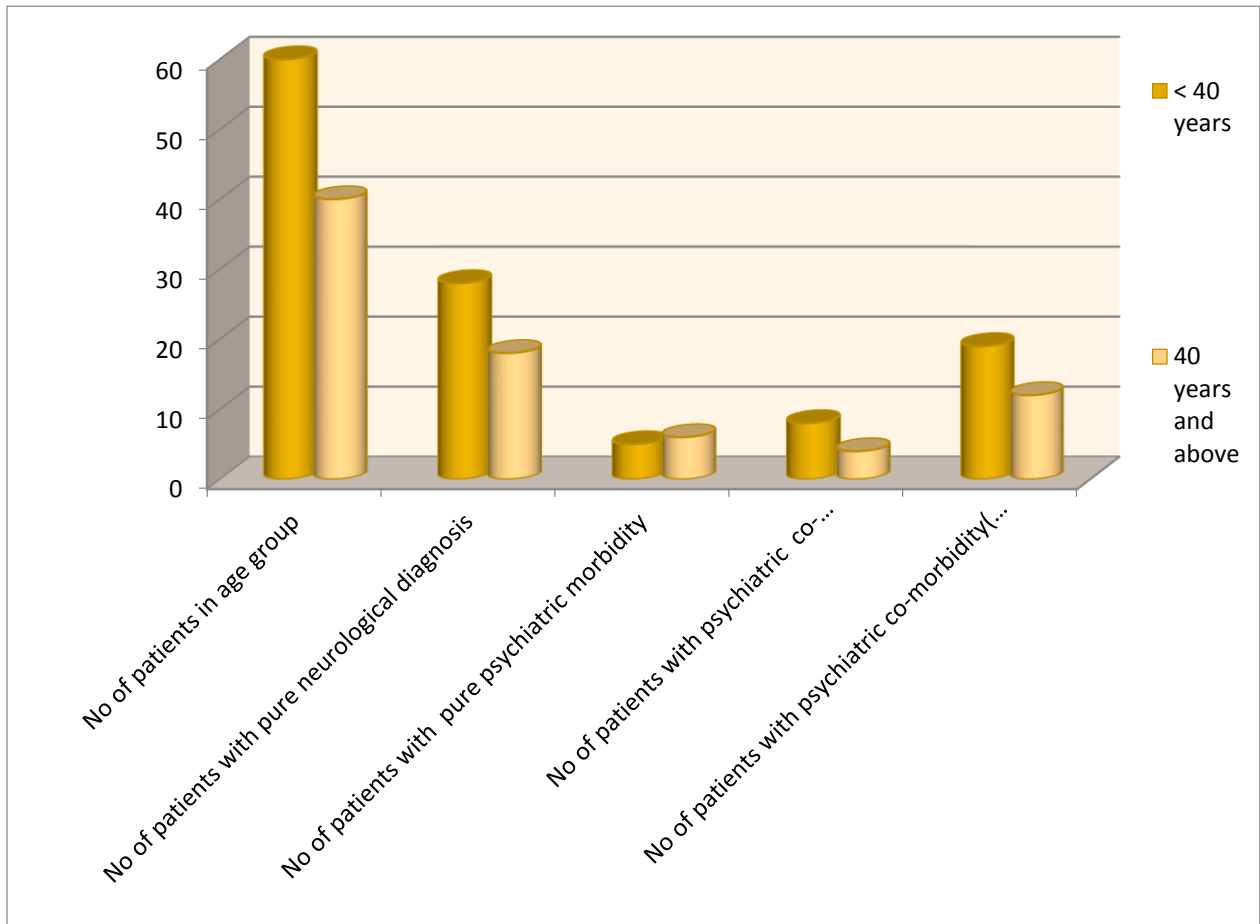
# RESULTS

The data of 100 patients was analysed and findings of the study are tabulated below in the following order:

1. Distribution of patients according to Socio-demographic characteristics such as age, sex, marital status, education, occupation, family income, socioeconomic class and locality. ( Tables 1 to 7 and their respective charts)
2. Distribution of patients according to presence of pure neurological findings and presence of psychiatric co morbidity/morbidity.(table 8 and chart)
3. Distribution of patients according to prevalence of neurological disorder.(Table 9 )
4. Distribution of patients according to prevalence of psychiatric diagnosis(Table 10)
5. Distribution of patients according to prevalence of psychiatric diagnosis in epilepsy patients (Table 11 and chart)
6. Distribution of patients according to prevalence of psychiatric diagnosis in migraine/headache patients (Table 12 and chart)
7. Demographic profile wise distribution of psychiatric diagnosis amongst patients with percentage and statistical comparison between variables after dividing demographic data into two parts( Tables 13,14)

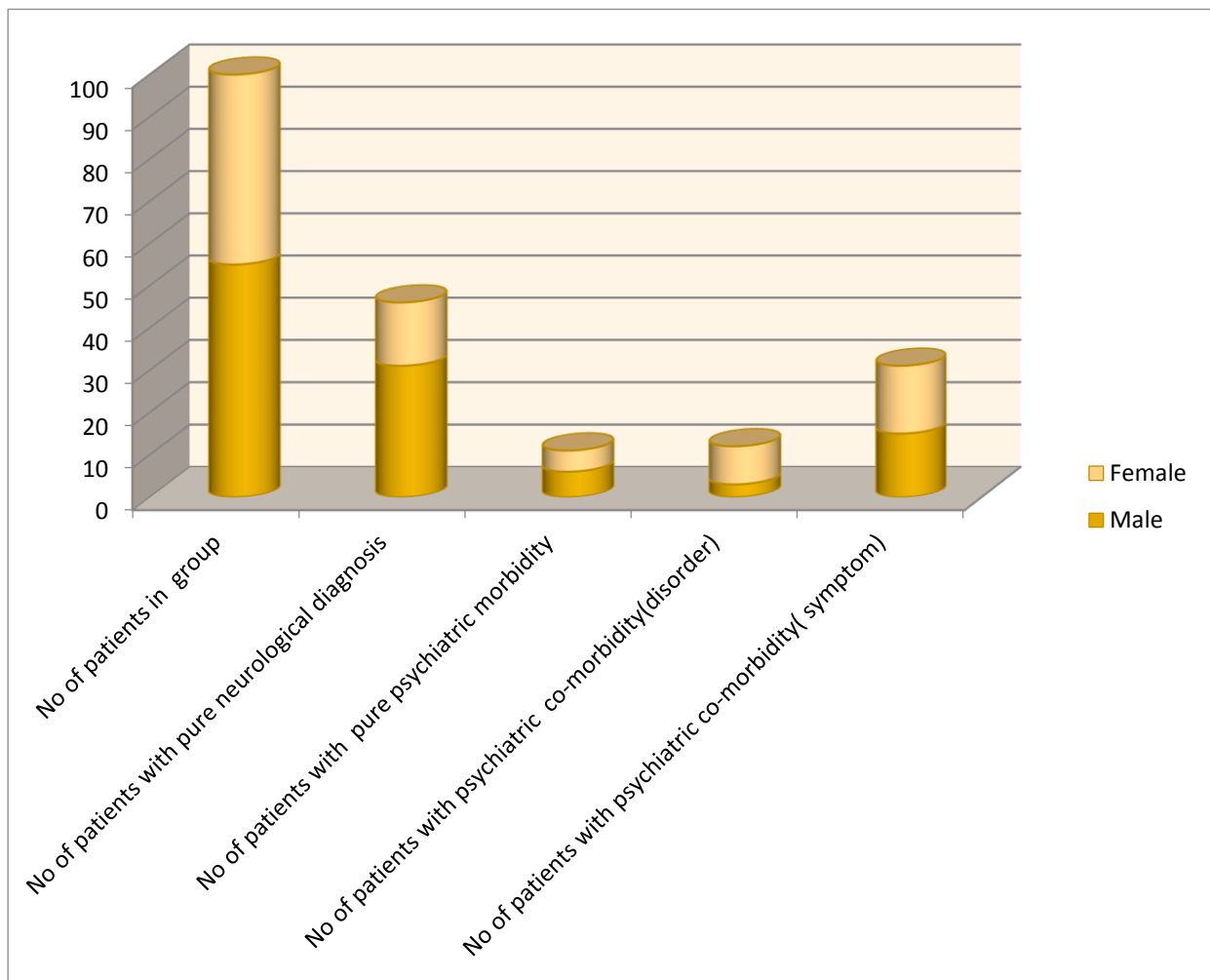
**Table 1: Age wise distribution of 100 patients attending neurology OPD**

Age group	No of patients in age group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
< 40 years	60	28	5	8	19
40 years and above	40	18	6	4	12
Total	100	46	11	12	31



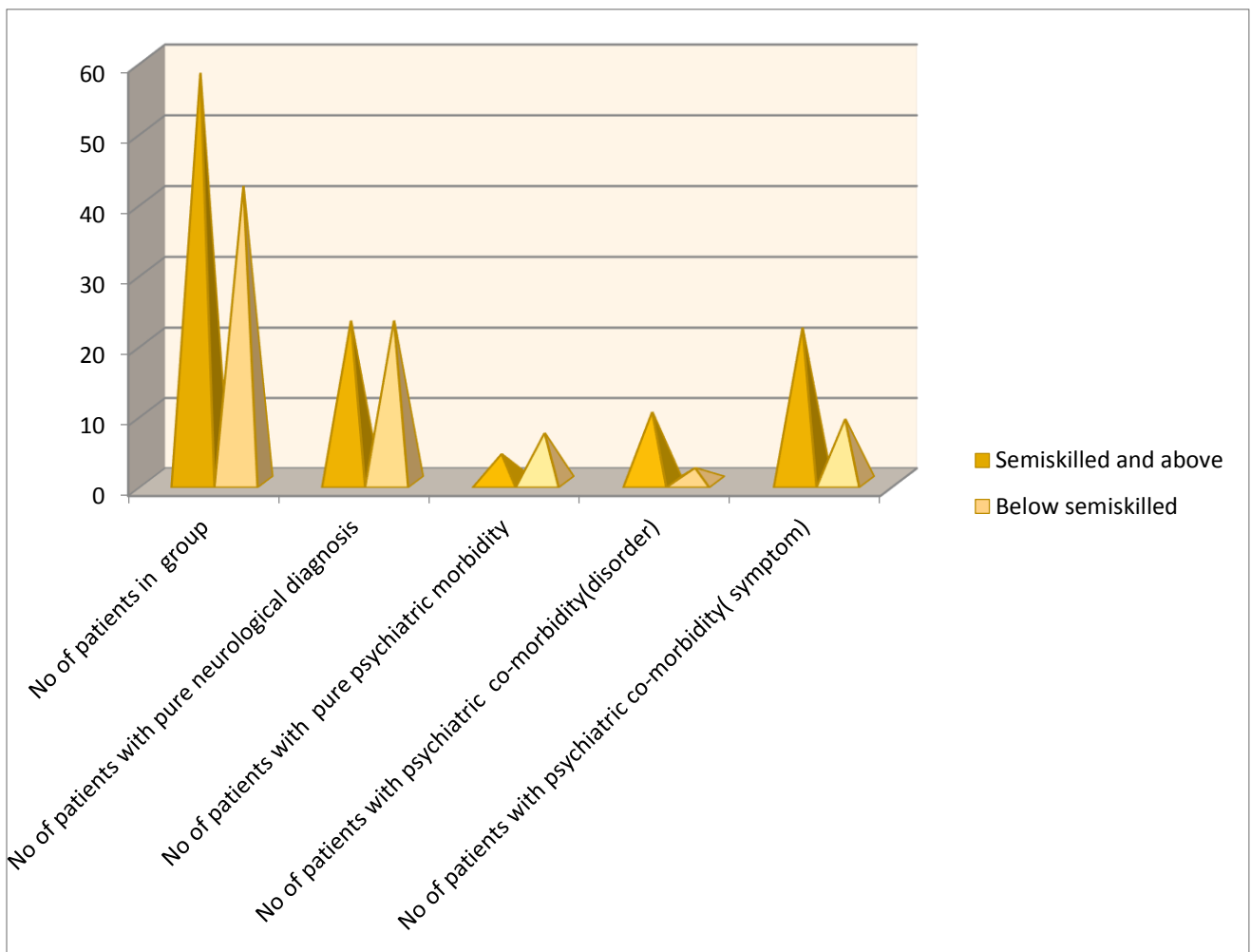
**Table 2: Gender wise distribution of 100 patients attending neurology OPD**

Gender	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity( symptom)
Male	55	31	6	3	15
Female	45	15	5	9	16
Total	100	46	11	12	31



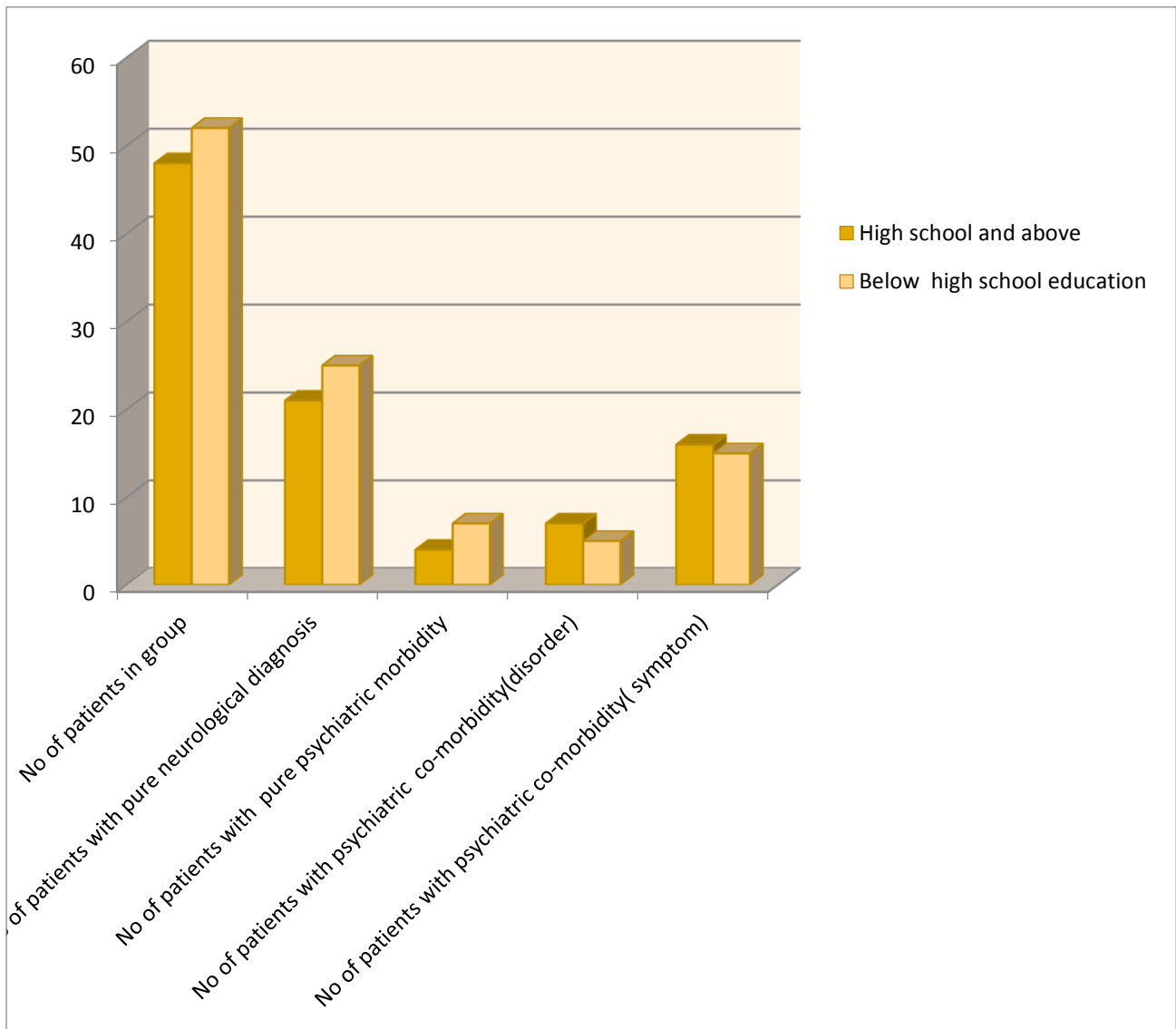
**Table 3: Occupation wise distribution of 100 patients attending neurology OPD**

occupation	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
Semiskilled and above	58	23	4	10	22
Below semiskilled	42	23	7	2	9
Total	100	46	11	12	31



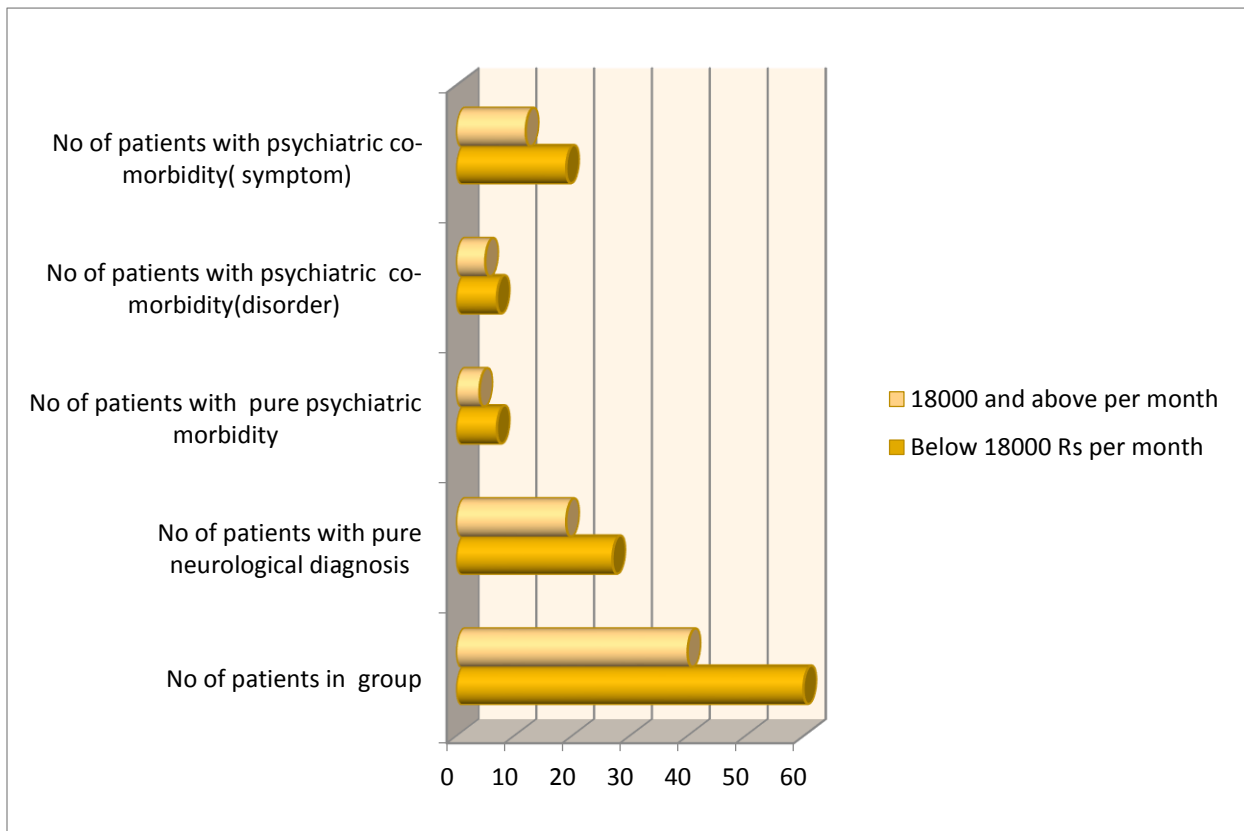
**Table 4: Education wise distribution of 100 patients attending neurology OPD**

Education	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
High school and above	48	21	4	7	16
Below high school education	52	25	7	5	15
Total	100	46	11	12	31



**Table 5: Family Incomewise distri. of 100 patients attending neurology OPD**

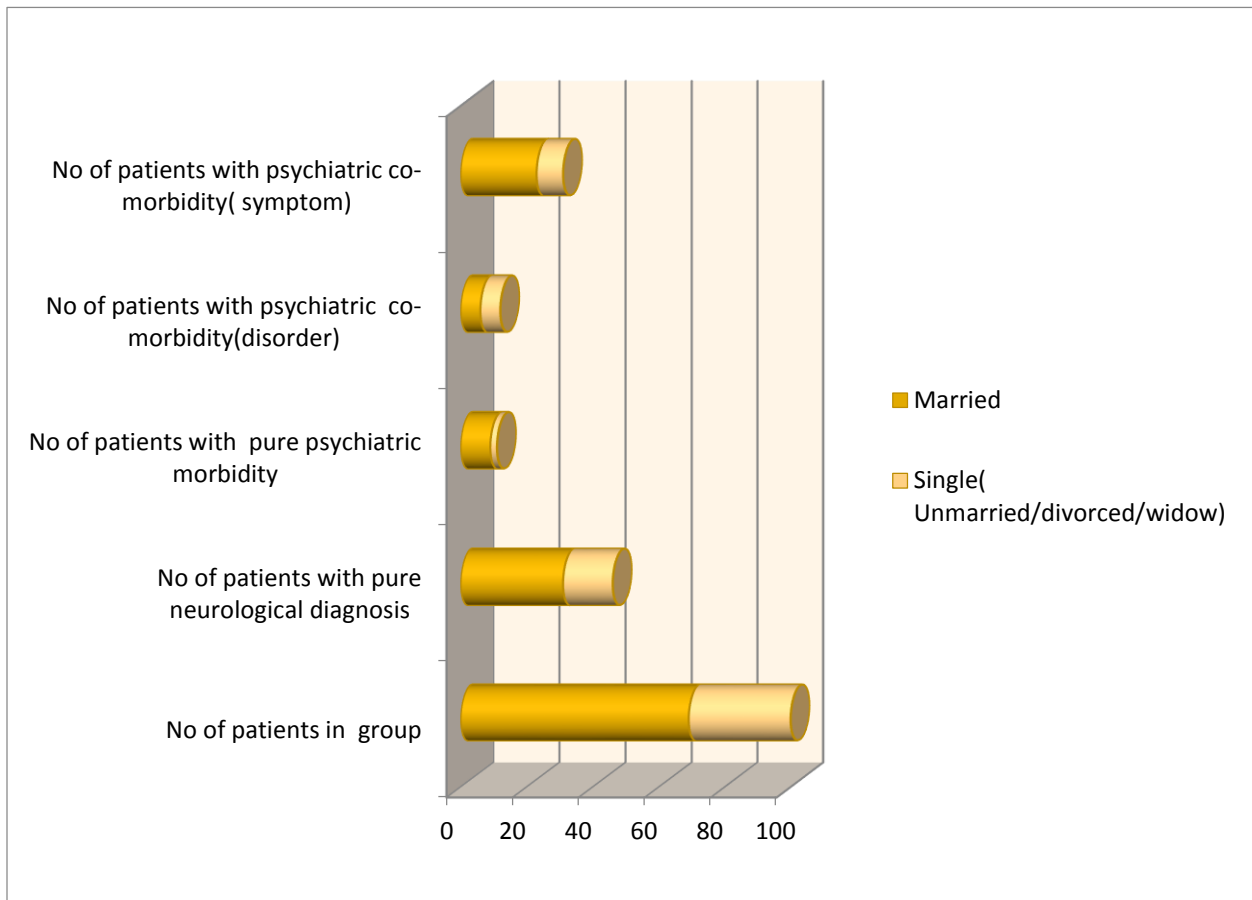
Family Income	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
Below 18000 Rs per month	60	27	7	7	19
18000 and above per month	40	19	4	5	12
Total	100	46	11	12	31





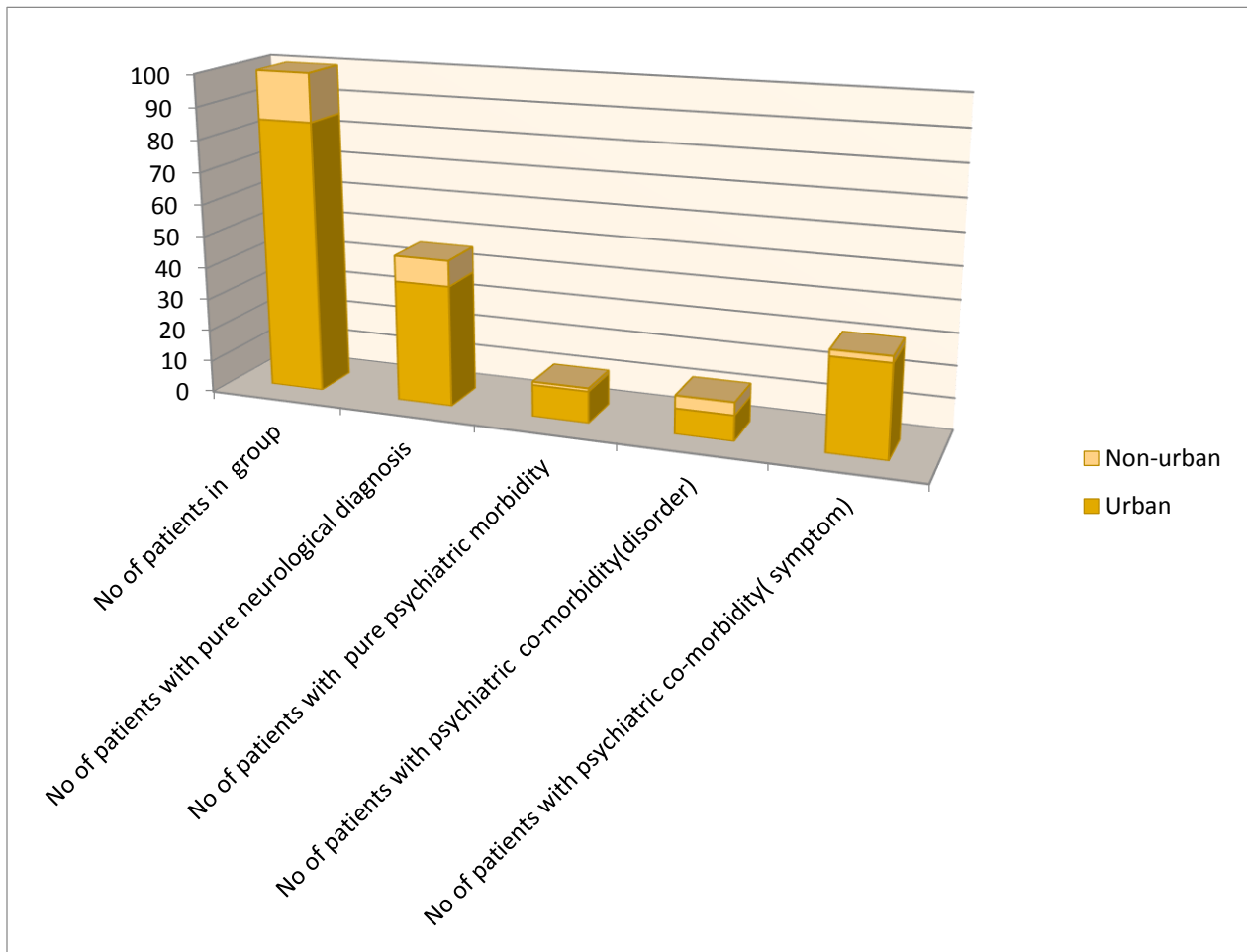
**Table 6:Marital status wise distribution of 100 patients attending neurology OPD**

Marital status	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
Married	69	31	9	6	23
Single( Unmarried/divorced/widow)	31	15	2	6	8
Total	100	46	11	12	31



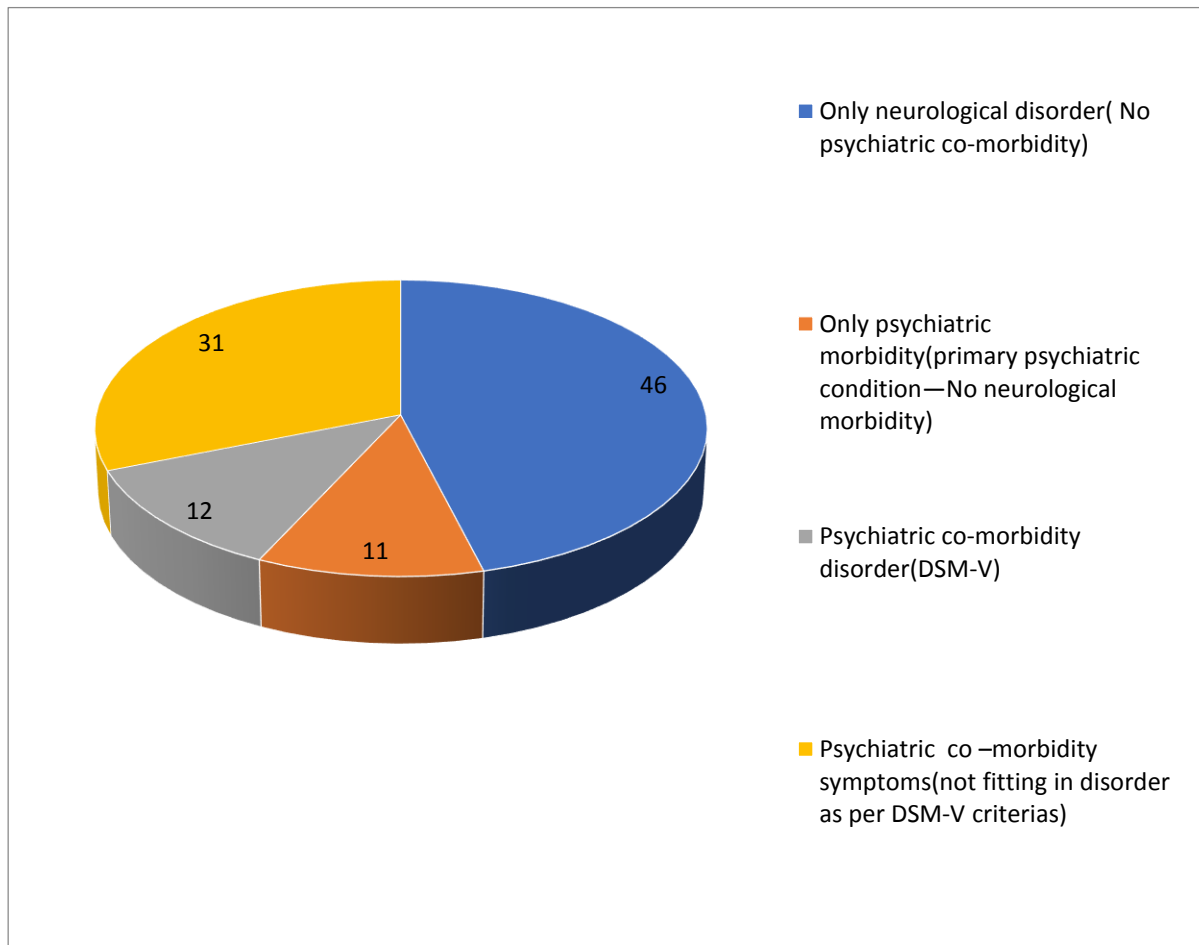
**Table 7: Residence wise distribution of 100 patients attending neurology OPD**

Residence	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity(disorder)	No of patients with psychiatric co-morbidity (symptom)
Urban	85	38	10	8	29
Non-urban	15	8	1	4	2
Total	100	46	11	12	31



**Table 8 : psychiatric co-morbidity/ morbidity amongst 100 patients attending neurology OPD**

Psychiatric morbidity/co-morbidity	No. of patients
Only neurological disorder( No psychiatric co-morbidity)	46
Only psychiatric morbidity(primary psychiatric condition—No neurological morbidity)	11
Psychiatric co-morbidity disorder(DSM-V)	12
Psychiatric co –morbidity symptoms( positive in BPRS scale but not fitting in disorder as per DSM-V criteria)	31
<b>Total</b>	<b>100</b>



**Table 9: Neurological diagnosis-wise distribution of 100 patients attending neurology OPD**

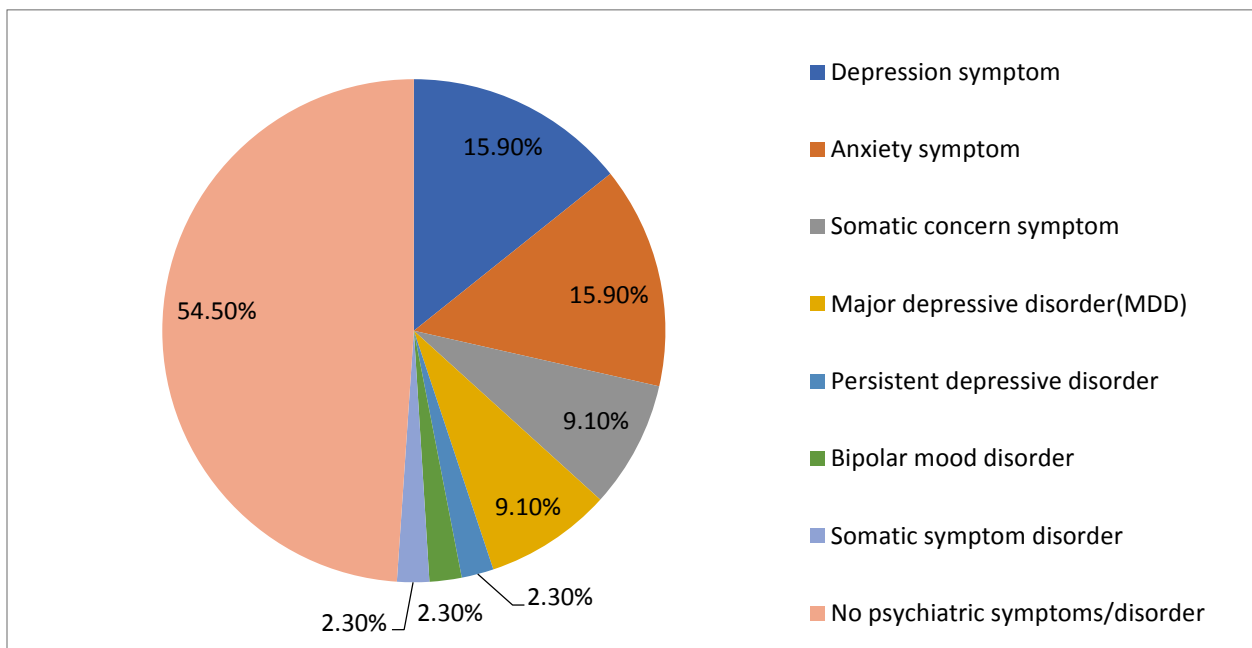
Neurological diagnosis	No of patients
Epilepsy /seizure disorder	44
Migraine and other Headaches	26
CV stroke	5
Parkinsonism and movement disorders	5
Peripheral neuropathy	4
Trigeminal neuralgia	3
Vertigo	1
Others	1
No neurological diagnosis( Primary psychiatric diagnosis)	11
Total	100

**Table10: Psychiatric diagnosis wise distribution of 23 patients attending neurology OPD having conclusive psychiatric diagnosis ( as per DSM-V)**

Psychiatric diagnosis	Patients with primary psychiatric diagnosis( DSM-V criteria)	Patient with psychiatric co-morbidity disorder (DSM-V criteria)	Total
Major depressive disorder(MDD)	4	6	10 (43.47%)
Persistent depressive disorder	2	1	3(13.04%)
Psychotic disorders	2	1	3(13.04%)
Somatic symptom disorder	1	2	3(13.04%)
Bipolar mood disorder	1	1	2(8.7%)
Conversion disorder	1	0	1(4.35%)
Anxiety disorders	0	1	1(4.35%)
Total	11	12	23

**Table11: Psychiatric diagnosis wise distribution of 44 patients attending neurology OPD having epilepsy/seizure disorder ( as per BPRS scale and DSM-V)**

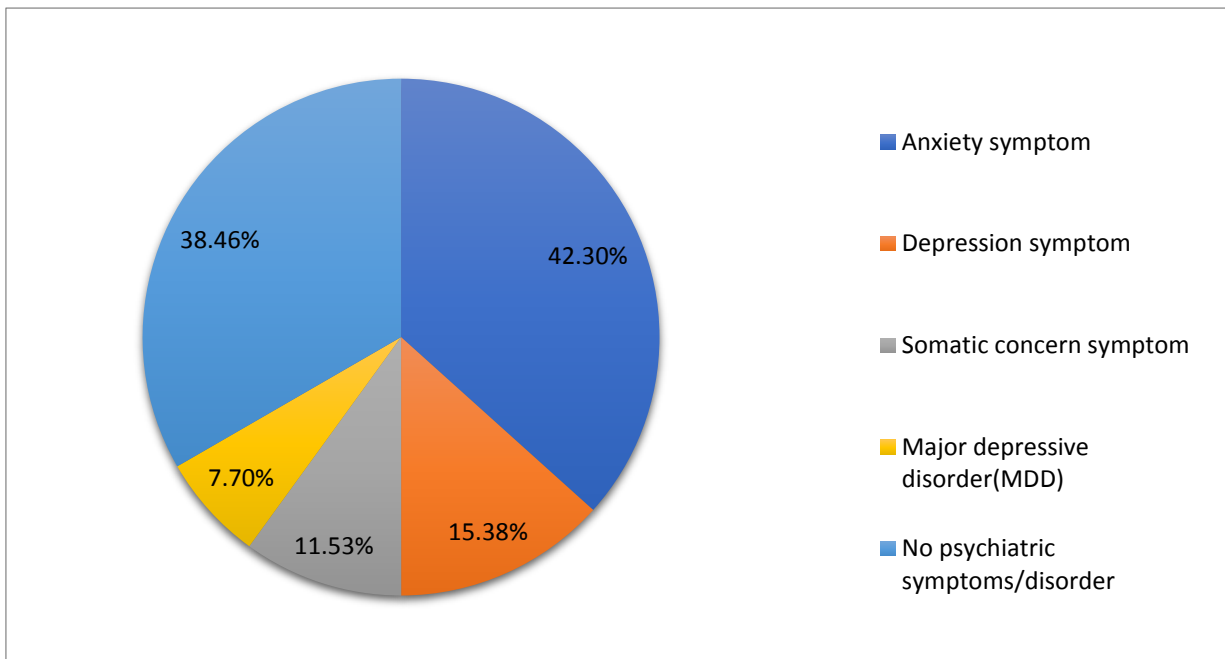
Psychiatric diagnosis	Epilepsy /seizure disorder patients with psychiatric co-morbidity (BPRS scale and DSM-V criteria)
Depression symptom	7 (15.9%)
Anxiety symptom	7(15.9%)
Somatic concern symptom	4 (9.1%)
Major depressive disorder(MDD)	4(9.1%)
Persistent depressive disorder	1(2.3%)
Bipolar mood disorder	1(2.3%)
Somatic symptom disorder	1(2.3%)
No psychiatric symptoms/disorder	24(54.5%)
Total	44



**Pie Chart: Psychiatric diagnosis in epilepsy patients attending neurology OPD**

**Table 12:Psychiatric diagnosis-wise distribution of 26 patients attending neurology OPD having migraine/other headaches (as per BPRS scale &DSM-V)**

Psychiatric diagnosis	Migraine/headaches patients with psychiatric co-morbidity disorder (BPRS scale & DSM-V criteria)
Anxiety symptom	11(42.3%)
Depression symptom	4 (15.38%)
Somatic concern symptom	3 (11.53%)
Major depressive disorder(MDD)	2( 7.7%)
No psychiatric symptoms/disorder	10(38.46%)
Total	26



**Pie chart: Psychiatric diagnosis in Migraine/headaches patients attending neurology OPD**

**Table 13 : Demographic profile wise patient distribution**

Demographic profile	Groups	No of patients in group	No of patients with pure neurological diagnosis	No of patients with pure psychiatric morbidity	No of patients with psychiatric co-morbidity (disorder)	No of patients with psychiatric co-morbidity ( symptom)
Age	< 40 years	60	28	5	8	19
	40 years and above	40	18	6	4	12
Gender	Male	55	31	6	3	15
	Female	45	15	5	9	16
education	High school and above	48	21	4	7	16
	Below high school education	52	25	7	5	15
occupation	Semiskilled and above	58	23	4	10	22
	Below semiskilled	42	23	7	2	9
Family income	Below 18000 Rs per month	60	27	7	7	19
	18000 and above per month	40	19	4	5	12
Socioeconomic class	Upper and middle class(score more than 10)	57	26	5	6	20
	Lower class(10 or less score)	43	20	6	5	11
Marital status	Married	69	31	9	6	23
	Single( Unmarried/divorced/widow)	31	15	2	6	8
Residence	Urban	85	38	10	8	29
	Non-urban	15	8	1	4	2



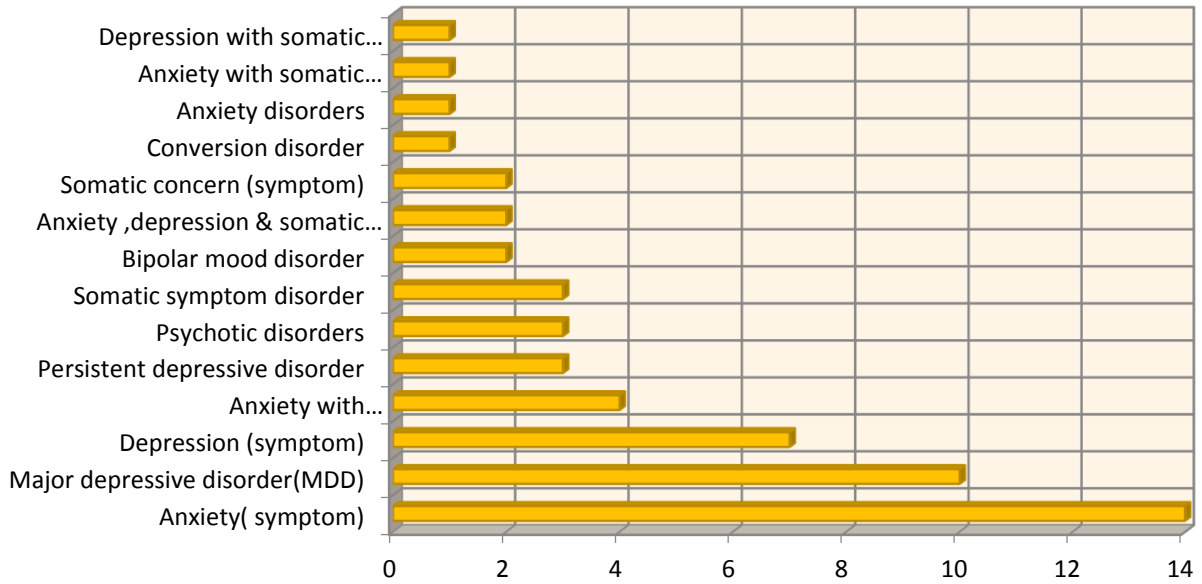
**Table 14 : Demographic profile wise patient distribution-percentage wise and statistical significance**

Demographic profile	Groups	No of patients in group	No of patients with pure neurological diagnosis	No of patients with psychiatric morbidity/co morbidity	(p-Value) Statistical significance
Age	< 40 years	60	28 (46.67%)	32 (53.33%)	0.87
	40 years and above	40	18(45%)	22(55%)	
Gender	Male	55	31(56.37%)	<b>24(43.63%)</b>	<b>0.02</b> <b>(significant)</b>
	Female	45	15(33.33%)	<b>30(66.66%)</b>	
education	High school and above	48	21(43.75%)	27(56.25%)	0.66
	Below high school education	52	25(48.08%)	27(51.92%)	
occupation	Semiskilled and above	58	23(37.94%)	<b>36(62.06%)</b>	0.09
	Below semiskilled	42	23(57.15%)	<b>18(42.85%)</b>	
Family income	Below 18000 Rs per month	60	27(45%)	33(55%)	0.80
	18000 and above per month	40	19(47.5%)	21(52.5%)	
Socioeconomic class	Upper and middle class(score more than 10)	57	26(45.62%)	31(54.38%)	0.92
	Lower class(10 or less score)	43	20(46.52%)	23(53.48%)	
Marital status	Married	69	31(44.9%)	38(55.1%)	0.79
	Single( Unmarried/divorced/widow)	31	15(48.39%)	16(51.61%)	
Residence	Urban	85	38(44.7%)	<b>47(55.3%)</b>	0.54
	Non-urban	15	8(53.33%)	<b>7(46.66%)</b>	

**Table 15: Percentage wise Psychiatric diagnosis ( symptom/disorder –as per BPRS scale and DSM V criteria) in 100 patients attending neurology OPD**

Psychiatric diagnosis ( as per BPRS scale and DSM-V criteria where applicable)	No/percentage of patients out of Total 100 OPD patients ( BPRS scale and DSM-V criteria)
Anxiety( symptom)	14
Major depressive disorder(MDD)	10
Depression (symptom)	7
Anxiety with depression(symptoms)	4
Persistent depressive disorder	3
Psychotic disorders	3
Somatic symptom disorder	3
Bipolar mood disorder	2
Anxiety ,depression & somatic concern(symptoms)	2
Somatic concern (symptom)	2
Conversion disorder	1
Anxiety disorders	1
Anxiety with somatic concern(symptoms)	1
Depression with somatic concern(symptoms)	1
No psychiatric diagnosis(symptom/disorder)	46
Total	100

■ No/percentage of patients out of Total 100 OPD patients ( BPRS scale and DSM-V...





## DISCUSSION

- **Prevalence of psychiatric morbidity/co-morbidity in Neurology OPD**

In our study, we found **54% patients** with psychiatric co-morbidity/ morbidity out of 100 patients in neurology OPD .

Similar study of “Psychiatry Morbidity In Patients Attending Neurological Outpatient Department “by Javid Ahmad. et al found 300 patients (60%) out of 500 had psychiatric diagnosis.<sup>(4)</sup>

The prevalence of psychiatric illness (as determined by the psychiatric interview) in neurology inpatients in a tertiary referral center was found to be 51.3% in Psychiatric disorders in inpatients on a neurology ward by Kate Jefferies et.al in 2007<sup>(8),(14)</sup>.

The results of our study show similar results with regard to co-morbidity and morbidity as studies mentioned above.

This clearly emphasizes that neurological and psychiatric issues are not mutually exclusive. Not only both can co-exist but also sometimes one can be mistaken for other. Therefore, there is urgent need for the neurologist to have high degree of suspicion for the existence of psychiatric complaints in patients primarily attending neurology OPD so this huge amount of psychiatric morbidity does not go unaddressed.

- **Prevalence of psychiatric symptoms in neurology OPD patients**

In our study, patients with anxiety are 14% , depressive symptoms are 7% , both symptoms are 4% . There are 10% patients with major depressive disorder.

In the similar study “Psychiatric Co-morbidity in Neurological Disorders: Towards a Multidisciplinary Approach to Illness Management in the United Arab Emirates by Taoufik Alsaadi, Seada Kassie et al”<sup>(39)</sup> , there was 39% prevalence of depressive symptoms , 34% rate of anxiety and 35.4% concurrent rate of both disorders. There the sample size was 395 patients.

This difference in both studies may be due to small sample size .

- **Prevalence of psychiatric co-morbidities in epilepsy/seizure patients.**

In our study , out of sampled patients with epilepsy and seizure disorders ,there were 15.9% patients with depressive symptoms and 9.1% with major depressive disorder. Overall 45.4% patients with epilepsy had Psychiatric Comorbidity or Morbidity.

In the study of Psychiatric Comorbidities and Outcomes in Epilepsy Patients: An Insight from a Nationwide Inpatient Analysis in the United States by Rikinkumar S Patel, Ahmed Elmaadawi et al<sup>(40)</sup> of 440 epilepsy patients , 13% had depression. It is estimated that there is 39.9% prevalence of psychiatric morbidities in patients with epilepsy.<sup>(10)(11)</sup>

There is similarity in percentage of patients in Epilepsy with depression.

In the study of Psychiatric disorders in Neurology at department of Neurology at Tuzla University, the prevalence of depression in Epilepsy ranges from 20 to 55 %.

Depression that occurs in epilepsy tends to be episodic and appears most often when the epileptic foci affect temporal lobe of the non-dominant cerebral hemisphere. The importance of depressive symptoms may be attested to by the increased incidence of attempted suicide in people with epilepsy. So, if early diagnosis of depression is made with high degree of suspicion in such epilepsy patients having long course of illness and addressed/ treated timely, patient can have good quality life and better compliance for treatment to primary illness-epilepsy.

- **Prevalence of psychiatric co-morbidities in migraine/headaches patients.**

In our study, out of patients with Migraine and other headaches , 42.3 % have anxiety symptoms , 15.38% have depressive symptoms, 7.7% with Major depressive disorder.

In the Study of psychiatric co-morbidity in patients with headache using a short structured clinical interview in a rural neurology clinic in Western India by Soham Dilip Desai et al. , 49 out of 101 (48.5%) patients with headache suffered from depressive disorders (dysthymia or depression or suicidality), 18 out of 101 patients with headache (17.90%) suffered from anxiety related disorders

The results may be different due to different population sample.

Migraine and other chronic daily headaches are common in people who suffer from anxiety disorders. Also people who suffer from migraine have anxiety regarding future episodes of migraine due to debilitating nature. Anxiety can be in form of generalized anxiety disorder, panic disorder, panic attacks and specific phobias. So, detection and treatment of anxiety disorders can be helpful in migraine.

- **Role of Socio-Demographic factors with Psychiatric morbidities/ comorbidities.**

**1. Age:** In our study, one group of patients with age < 40 years included 60 % of total patients - out of which 53.3% patients had some psychiatric morbidity/co-morbidity.

Remaining group of patient with age 40 years and above included 40% of total patients-out of which 55% patients had some psychiatric morbidity/co-morbidity.

The minimal difference amongst these two groups was found to be statistically insignificant (p-value 0.87 on chi-square test).

**2. Gender:** In our study, male patients included 55 % of total patients - out of which 43.63% patients had some psychiatric morbidity/co-morbidity. Femal patients included 45% of total patients-out of which 66.66 % patients had some psychiatric morbidity/co-morbidity.

**The difference amongst these two groups was found to be statistically significant (p-value 0.02 on chi-square test).**

In the spectrum of mental health, women are two to three times more likely to be diagnosed with depression and anxiety, some reasons being violence against women, hormonal changes during menarche, pregnancy and postmenopausal phases, social adjustment issues etc.

**3. Marital Status:** In our study, married patients included 69 % of total patients - out of which 55.1% patients had some psychiatric morbidity/co-morbidity. Single patients (unmarried/divorced/widowed ) included 31% of total patients-out of which 51.61 % patients had some psychiatric morbidity/co-morbidity.



The difference amongst these two groups was found to be statistically insignificant (p-value 0.79 on chi-square test).

**4. Education:** In our study, patients with below high school level education included 48 % of total patients - out of which 56.25% patients had some psychiatric morbidity/co-morbidity.

Patients with high school level and above education included 52 % of total patients - out of which 51.92% patients had some psychiatric morbidity/co-morbidity.

The difference amongst these two groups was found to be statistically insignificant (p-value 0.66 on chi-square test).

**5. Occupation:** In our study, patients with semiskilled and above level occupation included 58 % of total patients - out of which 62.06% patients had some psychiatric morbidity/co-morbidity.

Patients with below semiskilled level occupation included 42 % of total patients - out of which 42.85% patients had some psychiatric morbidity/co-morbidity.

The difference amongst these two groups was found to be statistically insignificant, however.( p-value 0.09 on chi-square test).

**6. Family income:** In our study, patients with below 18000 per month family income included 60 % of total patients - out of which 55% patients had some psychiatric morbidity/co-morbidity.

Patients with high school level and above 18000 per month family income included 40 % of total patients - out of which 52.5% patients had some psychiatric morbidity/co-morbidity.

The difference amongst these two groups was found to be statistically insignificant (p-value 0.80 on chi-square test).

**7. Socio-economic Status:** The quality of life, reflected by socio-economic status always has a major impact on both physical and mental health of individuals.

In our study, one group of patients with upper /middle class included 57 % of total patients - out of which 54.38% patients had some psychiatric morbidity/co-morbidity.

Remaining group of patient with lower socio-economical class included 43% of total patients-out of which 53.48% patients had some psychiatric morbidity/co-morbidity.

The minimal difference amongst these two groups was found to be statistically insignificant (p-value 0.92 on chi-square test).

**8. Residence:** In our study, urban patients included 85 % of total patients - out of which 55.3% patients had some psychiatric morbidity/co-morbidity.

Non-urban patients included 15 % of total patients - out of which 46.66% patients had some psychiatric morbidity/co-morbidity.

The difference amongst these two groups was found to be statistically insignificant (p-value 0.54 on chi-square test).

## SUMMARY

In our study of 100 patients, we found 54 % of patients attending neurology OPD having psychiatric morbidities/co-morbidities, out of which 11 % had primary (pure) psychiatric diagnosis instead of having any neurological disorder suggestive of overlap of symptoms/perception of symptoms amongst neurology and neuropsychiatry.

The socio-demographic factors –age, education, family income, socioeconomic class, marital status had overall no statistically significant difference in prevalence of psychiatric morbidities/co-morbidities when divided into two equivalent subgroups.

Factors like occupation and residence had differences in prevalence of psychiatric morbidities/ co-morbidities but statistically these differences were insignificant (p value > 0.05).

Females had significantly higher prevalence of psychiatric illness than males and the difference was statistically significant when subjected to analysis (p-value 0.02).

Amongst psychiatric morbidities/co-morbidities, commonest was symptoms of anxiety (14%) followed by major depressive disorder (10%) and depressive symptoms(7%).

Most common neurological diagnosis were epilepsy/seizures (44%) followed by migraine/headaches (26%).

Symptoms of anxiety (16%) and depression (16%) were most common of prevalent psychiatric co-morbidities in epilepsy/seizure patients.

Symptoms of anxiety (42%) were most common of prevalent psychiatric comorbidities in migraine/headache patients.

## CONCLUSION

Psychiatric morbidities/co-morbidities account for more than half of neurology OPD patients even at tertiary hospital having separate departments for neurology and psychiatry. Symptoms of some neurological illness are overlapping with psychiatric diagnosis and hence it is common for a layman to attend neurology OPD seeking help despite of having psychiatric morbidity/ co-morbidity and it is quite evident in our study also. Need of hour is creating awareness regarding possibility of presence of psychiatric ailments in form of primary diagnosis or co-morbidity with neurological disorder which will lead to seeking timely help of psychiatrist for early diagnosis and treatment .

Cross-reference in tertiary hospital from neurology to psychiatry, higher referral from primary health centre level to available psychiatrist, penetration of specialist services of psychiatrist in remote places up to primary health care level and awareness amongst patients/ layman regarding existence of psychiatric illnesses along with or without neurological illnesses are requirements of present era.



## **FUTURE SCOPE**

- Larger studies in more than one institute could substantiate our findings because sampling in our study included patient attending tertiary hospital in urban locality. Data from health care facility at secondary or primary level and data including rural population might give additional findings.





## REFERENCES

1. John Moriarty. Psychiatric disorders in neurology. *J Neurol Neurosurg Psychiatry* 2007; (78): 331.
2. Constantin G. Lyketos, Nicholas Kazor, Peter Rabins. Psychiatric manifestations in neurologic disease: where are we headed?. *Dialogues in clinical neurosciences* 2007; (2): 111-124.
3. . Osman Sinanovic. *Psychiatric disorder in neurology*. : National library of medicine; 2012.
4. Psychiatry Morbidity in Patients Attending Neurological OPD 951 International Journal of Medical Science and Public Health | 2013 | Vol 2 | Issue 4 Psychiatry Morbidity In Patients Attending Neurological Outpatient Department. *International Journal of Medical Science and Public Health* 2013; 2(4): .4
5. Ramsay RA. Neurology and psychiatry: interface and integration. *Psychosomatics* 1979; 20 (4): 269-77.
6. Kirk C, Saunders M. Primary psychiatric illness in a neurological outpatient department in North East England. An assessment of symptomatology. *Acta Psychiatr Scand* 1977; 56 (4): 294- 302.
7. Metcalfe R, Firth D, Pollock S, et al. Psychiatric morbidity and illness behaviour in female neurological inpatients. *J Neurol Neurosurg Psychiatry* 1988; 51(11): 1387-90.
8. Fink P, Hansen MS, Søndergaard L, Frydenberg M. Mental illness in neurological patients. *J Neurol Neurosurg Psychiatry* 2003; 74(6): 817-9.

9. Sheehan D, Shytle D, Milo K, Lecrubier Y, Herguetta T. Mini International Neuropsychiatric Interview for children and adolescents. Available from: URL: <http://www.medical-outcomes.com>
10. Perkin GD. An analysis of 7836 successive new out patients referral. *J Neurol Neurosurg Psychiatry* 1989;52(4):447–8.
11. Carsson A, Rinbauer B, Mac Kanzie L, Warlow C, Sharpe M. Neurological diseases, Emotional disorders and disability: they are related:a study of 300 consecutive new referral to a neurology out patients department. *J Neurol Neurosurg Psychiatry* 2000;68(2): 202–6.
12. Williams LS, Jones WJ, Shen J, Robinson RL, Weinberger M, Kroenke K. Prevalance and impact of depression and pain in neurology out patients. *J Neurol Neurosurg Psychiatry* 2003;74(11):1587-9.
13. Carson AJ, Best S, Warlow C, Sharpe M. Suicidal ideation among out patients at general neurology clinics: Prospective study. *BMJ*. 2000 May 13;320(7245):1311-2.
14. Folstein SE, Folstein MF. Psychiatric feathures of huntigtons disease : Recent approach and finding. *Psychiatr Dev* 1983;1(2):193-205.
15. Starkstein SE ,Robinson RG. Affective disorders and cerebral vascular disease. *Br J Psychiatry* 1989;154:170- 82.
16. Soaham Dilip Desai and Radhika Himanshu Pandya. Study of psychiatric comorbidity in patients with headache using a short structured clinical interview in a rural neurology clinic in Western India
17. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2013;380:2163–96. [PMC free article] [PubMed] [Google Scholar]

18. . Antonaci F, Nappi G, Galli F, Manzoni GC, Calabresi P, Costa A. Migraine and psychiatric comorbidity: A review of clinical findings. *J Headache Pain*. 2011;12:115–25. [PMC free article] [PubMed] [Google Scholar]
19. . Pompili M, Di Cosimo D, Innamorati M, Lester D, Tatarelli R, Martelletti P. Psychiatric co-morbidity in patients with chronic daily headache and migraine: A selective overview including personality traits and suicide risk. *J Headache Pain*. 2009;10:283–90. [PMC free article] [PubMed] [Google Scholar]
20. Mini International Neuropsychiatric Interview English Version 5.0.0 DSM IV. [Last accessed on 2013 May 23]. Available from: <http://www.nccpsychiatry.info/File/MINI500.pdf> .
21. Text Revision: American Psychiatric Association. 4th text edition 2000. The Diagnostic and Statistical Manual of Mental Disorders DSM-IV TR. [Google Scholar]
22. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders. 2nd ed. Suppl 1. Vol. 24. Cephalalgia: 2004. pp. 9–160. [PubMed] [Google Scholar]
23. Olesen J, Boussier MG, Diener HC, Dodick D, First M, Goadsby PJ, et al. Headache Classification Committee. New appendix criteria open for a broader concept of chronic migraine. *Cephalalgia*. 2006;26:742–6. [PubMed] [Google Scholar]
24. Samaan Z, Farmer A, Craddock N, Jones L, Korszun A, Owen M, et al. Migraine in recurrent depression: Case-control study. *Br J Psychiatry*. 2009;194:350–4. [PubMed] [Google Scholar]
25. Hung CI, Liu CY, Cheng YT, Wang SJ. Migraine: A missing link between somatic symptoms and major depressive disorder. *J Affect Disord*. 2009;117:108–15. [PubMed] [Google Scholar]

26. Ratcliffe GE, Enns MW, Jacobi F, Belik SL, Sareen J. The relationship between migraine and mental disorders in a population-based sample. *Gen Hosp Psychiatry*. 2009;31:14–9. [PubMed] [Google Scholar]
27. Camarda C, Pipia C, Tagliavori A, Di Fiore P, Camarda R, Monastero R. Comorbidity between depressive symptoms and migraine: Preliminary data from the Zabút Aging Project. *Neurol Sci*. 2008;29(Suppl 1):S149–51. [PubMed] [Google Scholar]
28. . Jette N, Patten S, Williams J, Becker W, Wiebe S. Comorbidity of migraine and psychiatric disorders--a national population-based study. *Headache*. 2008;48:501–16. [PubMed] [Google Scholar]
29. . Lantéri-Minet M, Valade D, Géraud G, Chautard MH, Lucas C. Migraine and probable migraine--results of FRAMIG 3, a French nationwide survey carried out according to the 2004 HIS classification. *Cephalalgia*. 2005;25:1146–58. [PubMed] [Google Scholar]
30. Kececi H, Dener S, Analan E. Co-morbidity of migraine and major depression in the Turkish population. *Cephalalgia*. 2003;23:271–5. [PubMed] [Google Scholar]
31. Puca F, Genco S, Prudenzeno MP, Savarese M, Bussone G, D'Amico D, et al. Psychiatric comorbidity and psychosocial stress in patients with tension-type headache from headache centers in Italy. The Italian collaborative Group for the study of psychopathological factors in primary headaches. *Cephalalgia*. 1999;19:159–64. [PubMed] [Google Scholar]
32. Holroyd KA, Stensland M, Lipchik GL, Hill KR, O'Donnell FS, Cordingley G. Psychosocial correlates and impact of chronic tension-type headaches. *Headache*. 2000;40:3–16. [PMC free article] [PubMed] [Google Scholar]

33. Verri AP, Proietti Cecchini A, Galli C, Granelle F, Sandrini G, Nappi G. Psychiatric comorbidity in chronic daily headache. *Cephalalgia*. 1998;18(Suppl 21):45–9. [PubMed] [Google Scholar]
34. Mitsikostas DD, Thomas AM. Comorbidity of headache and depressive disorders. *Cephalalgia*. 1999;19:211–7. [PubMed] [Google Scholar]
35. Zwart JA, Dyb G, Hagen K, Ødegård KJ, Dahl AA, Bovim G, et al. Depression and anxiety disorders associated with headache frequency. The Nord-Trøndelag Health Study. *Eur J Neurol*. 2003;10:147–52. [PubMed] [Google Scholar]
36. Yong N, Hu H, Fan X, Li X, Ran L, Qu Y, et al. Prevalence and risk factors for depression and anxiety among outpatient migraineurs in mainland China. *J Headache Pain*. 2012;13:303–10. [PMC free article] [PubMed] [Google Scholar]
37. Hamelsky SW, Lipton RB. Psychiatric comorbidity of migraine. *Headache*. 2006;46:1327–33. [PubMed] [Google Scholar]
38. Silberstein SD, Lipton RB. Overview of diagnosis and treatment of migraine. *Neurology*. 1994;44(10 Suppl 7):S6–16. [PubMed] [Google Scholar]
39. Taoufik Alsaadi, Seada Kassie, Ola Mohamed Ali, Khaldoun Mozahem, Safana al Fardan and Ahmed M. Ahmed. Psychiatric Comorbidity in Neurological Disorders: Towards a Multidisciplinary Approach to Illness Management in the United Arab Emirates. *Frontiers in psychiatry* 2019; (): .
40. Rikinkumar Patel et al..Psychiatric Comorbidities and Outcomes in Epilepsy Patients: An Insight from a Nationwide Inpatient Analysis in the United States.



# ANNEXURES

- Consent Forms
- Semi-structured Proforma
- Brief Psychiatric Rating Scale version 4.0

## CONSENT FORM

Date:

I, \_\_\_\_\_, am giving consent voluntarily to enroll myself in the research project conducted by Dr . KESHA M. KHETANI, who is a post graduate student in Psychiatry at B J Medical College, Ahmedabad. This study is about “A Study of Psychiatric Morbidity and Comorbidity in patients attending Neurology OPD ”. I am informed about the procedure of this study. I know that it is a non-commercial and educational study. I am informed that my identity and the results will be kept confidential throughout the study and the results will be used for research purpose only. I am not provided any remuneration for participation in this study. I also know that I am free to withdraw the consent at any time during the study. I give consent on my own free will.

Signature \_\_\_\_\_

Name:

Address:



## सहमतिपत्र

तारीख:

मैं \_\_\_\_\_ स्वेच्छासे डॉक्टर केशा एम खेतानी द्वारा संचालित अनुसंधान परियोजनामें खुदको भाग लेने के लिए सहमति देता हूं, जो बीजे मेडिकल कॉलेज, अहमदाबादमें मनोचिकित्सामें स्नातकोत्तर छात्र है। यह अध्ययन "मनोचिकित्सारुग्णता के बारे में एक अध्ययन है।" मुझे इस अध्ययन की प्रक्रिया के बारे में सूचित किया गया है। मुझे पता है कि यह एक गैर-व्यावसायिक और शैक्षिक अध्ययन है। मुझे सूचित किया जाता है कि मेरी पहचान और परिणामों को पूरे अध्ययन के दौरान गोपनीय रखा जाएगा और परिणामों का उपयोग केवल अनुसंधान प्रयोजन के लिए किया जाएगा।" मुझे इस अध्ययनमें भाग लेने के लिए कोई पारिश्रमिक नहीं दिया गया है। मुझे यह भी पता है कि मैं अध्ययन के दौरान किसीभी समय सहमति वापस लेनेके लिए स्वतंत्र हूं। मैं अपनी स्वतंत्र इच्छा पर सहमति देता हूं।

हस्ताक्षर \_\_\_\_\_

नाम:

पता:

# સંમતિફોર્મ

તારીખ:

હું,

\_\_\_\_\_, હાથ ધરાયેલા સંશોધન પ્રોજેક્ટ માં ભાગ લેવા સ્વૈચ્છિક સંમતિ આપુ છું જે અમદાવાદની બીજે મેડિકલ કૉલેજ માં સાઈકિયાટ્રીમાં પોસ્ટગ્રેજ્યુએટ વિદ્યાર્થીડૉ. કેશા એમ .ખેતાણી દ્વારા કરવામા આવે છે. આ અભ્યાસ "ન્યુરોલોજી ઓ.પી.ડી. માં મુખ્યત્વે આવતા દર્દીઓમાં માનસિક રોગો નો અભ્યાસ વિશે છે." મને આ અભ્યાસની પ્રક્રિયા વિશે માહિતી આપવામાં આવી છે. મને ખબર છે કે તે એક વ્યાવસાયિક અને શૈક્ષણિક અભ્યાસ છે. મને જાણ કરવામાં આવી છે કે મારી ઓળખ અને પરિણામો સમગ્ર અભ્યાસ દરમ્યાન ગુપ્ત રાખવામાં આવશે અને પરિણામોનો ઉપયોગ ફક્ત સંશોધન હેતુ માટે કરવામાં આવશે . મને આ અધ્યયનમાં ભાગ લેવા માટે કોઈ મહેનતાણું આપવામાં આવ્યું નથી. હું એ પણ જાણું છું કે અભ્યાસ દરમ્યાન ગમે ત્યારે સંમતિ પાછી ખેંચી લેવા હું સ્વતંત્ર છું. હું મારી સ્વતંત્ર ઈચ્છા પર સંમતિ આપું છું.

હસ્તાક્ષર \_\_\_\_\_

નામ:

સરનામું:

## **SEMI STRUCTURED PROFORMA:**

- Sr. No:
- Name of the patient:
- Age (in years):
- Sex: Male/Female
- Education: Profession /Postgraduate or Graduate/Post High School Diploma/High School/Middle School/Primary School/Illiterate
- Occupation: Professional /Semi-professional/Clerical, Shop owner/Skilled worker/Semi-skilled worker/Unskilled/Unemployed
- Family Income: >41430/20715-41429/15536-20714/10357-15535/6214-10356/2092-6213 2/<2091
- Socioeconomic class: Upper/Upper Middle/Lower Middle/Upper Lower/Lower
- Marital Status: Single/Married/Seperated/Divorced/Widowed
- Area of Residence: Rural/Urban
- Neurological diagnosis :
- Duration of symptoms of neurological diagnosis:
- BPRS SCORE –
- Presence of a DSM-V diagnosis: Yes/No If yes, diagnosis:
- Time When Psychiatric Symptoms Started:
- Past History :
- Family History:
- Substance History :

# Brief Psychiatric Rating Scale (BPRS)

(Version 4.0)

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

Rate items 1 through 14 on the basis of patient's self-report during interview. Mark "NA" for symptoms not assessed. Note items 7, 12, and 13 are also rated on observed behavior during the interview.

Provide examples.

	NA Not Assessed	1 Not Present	2 Very Mild	3 Mild	4 Moderate	5 Moderately Severe	6 Severe	7 Extremely Severe
1. Somatic Concern								
2. Anxiety								
3. Depression								
4. Suicidality								
5. Guilt								
6. Hostility								
7. Elevated Mood								
8. Grandiosity								
9. Suspiciousness								
10. Hallucinations								
11. Unusual Thought Content								
12. Bizarre Behavior								
13. Self-neglect								
14. Disorientation								

Rate items 15 through 24 on the basis of patient's observed behavior or speech during the interview.

15. Conceptual Disorganization								
16. Blunted Affect								
17. Emotional Withdrawal								
18. Motor Retardation								
19. Tension								
20. Uncooperativeness								
21. Excitement								
22. Distractibility								
23. Motor Hyperactivity								
24. Mannerisms and Posturing								

Sources of information (check all applicable):

- Patient  
 Parents/relatives  
 Mental health professional  
 Chart

Confidence in assessment:

\_\_\_\_\_ 1 = not at all — 5 = very confident

Explain here if validity is questionable:

- Symptoms possibly drug induced  
 Underreported due to lack of rapport  
 Underreported due to negative symptoms  
 Patient uncooperative  
 Difficult to assess due to formal thought disorder  
 Other \_\_\_\_\_

Adapted with permission from Manual for Expanded Brief Psychiatric Rating Scale [Expanded Version] developed at the UCLA Clinical Research Center for Schizophrenia & Psychiatric Rehabilitation, Robert Paul Liberman, MD [Principal Investigator] and published in Ventura J, Lukoff D, Nuechterlein KH, Liberman RP, Green MF, Shaner A. Training and quality assurance with the Brief Psychiatric Rating Scale. *Int J Methods Psychiatr Res.* 1993;3:221-244.

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## **KEY FOR MASTER CHART**

Name of column	Key	Details
Age	1	<40 Years
	2	40 Years and above
Gender	1	Male
	2	Female
Education	1	High school and above (Diploma, Graduate, Post-graduate, professional)
	2	Below high school (Middle school, Primary school, illiterate)
Occupation	1	Semi-skilled and above (skilled, shop owner, semi-professional, professional)
	2	Below semi-skilled (unskilled, unemployed)
Family Income (per month)	1	<18,000 Rs.
	2	18,000 Rs. And above
Marital status	1	Married
	2	Single
Area of residence	1	Urban
	2	Rural
Socio-economic status (kuppuswamy classification)	1	Score >10 (Upper, Upper-middle, Lower-middle class)
	2	10 or less (Upper- lower, lower class)