



epidemics has increased dramatically over a geographically expanding range.

Dengue fever erupts in an epidemic fashion usually during the monsoon season which falls from July to September. There are high number of patients who require hospitalization. Thus during the hospital stay it has been observed that apart from classic dengue symptoms there are some peculiar symptoms reported repeatedly [6]. The psychiatric abnormalities in the patients diagnosed with dengue is quite evident [7]. In this study an attempt is made to assess the psychiatric morbidity associated with dengue fever. The patients hospitalized with dengue were assessed by the psychiatric department for the symptoms of psychiatric morbidity

### SHYLRHRIOLWHDWH

Dinakaran et al, conducted a study in which they analysed 13 studies, and they concluded that the epidemic is related to psychiatric morbidity, especially mood disorders, which was common in such patients. However, the pathogenesis is not clear but the study indicates that it is related to the expression of HDACs receptor which modulated the mood in patients. The conventional therapy for treating mood disorders is not DVHGFWEYHERMLGHLJWKHODFN RIMSHELELW RIMKRGDLR RIDPLGGOH DJHG PDKRM GHHG WDFHHEDO □  
LBLEGLJWKH EFHSWR ZKH DWRKMDOVR OGHW LHG □  
DMLJLEDW IDSDMKHPOWLGLMFLSOLDMWGD GLDZKH □  
HuHFWRIGHJHRWKHIGDM TLWHHYLGHW RHYHMKH □  
literature and its association are sparsely reported in India. Longitudinal studies with adequate follow-up can improve the treatment outcomes and reduce the cost associated with treatment while enhancing the overall well-being of an individual [8].

Gunathilaka et al, conducted a study in which they DDOVHG WKHSMEKLDWLFHuHFWRIGHJH OSDWLHWV DIWH □  
WKHGHODHG HuHFWRIGHJH ZKH PRWKVHHW DNH □  
account considering the diagnosis of dengue, hospitalisation and other stress associated might result in acute stress. So, the probability of acute stress was completely eliminated. It was reported in the study that clinical depression and anxiety among the patients diagnosed with dengue was higher than the controls. Although the severity of depression varied VLLJLEDWORMHOOLJDIWHGHJHWHDWPHWLVHVHVH WLD □  
WRDGR GDSMEKLDWLFDMHV □

Lin H, et al in Taiwan based retrospective study found D VLLJLEDW DVVRELDWLR EHWHH GHJH DG SMEKLDW LF □  
morbidity. The NHGLJWKLM MWGDVWKHDVRELDWLR □  
between the geriatric population and psychiatric morbidity. The psychiatric disorders reported in this study ranged from dementia to anxiety disorder. The psychiatric morbidity was mostly found in patients above 60 years of age. However, they GLGRWGM LJLEDWGL GHHFHDKHPRELGLWDMVRELDW HG □  
with the gender of an individual [10].

Shih et al, conducted a study in which they evaluated the HuHFWRIGHJHRGHSHVVLVYHGLVVRGHDL LHWGLVVRGHDLG □  
sleep disorder. They evaluated the long term as well as short WHPHuHFWRIGHJH WDMHSRWHGDMWKLMMWGWKDWWK □  
sleep disorder such as Insomnia was short-lived among these individual, most sleep disorders were within 3 to 12 months DIWHWKHGLDJRVLMMZKHGLGRWGDM LJLEDW PEH □  
of anxiety disorder. Although the number of depressive disorders was very high. It was short term as well as long term associated with dengue. The depressive disorder was reported in individual even after 12 months of diagnosis of dengue [11].

Herbuela et al, conducted study of association of psychiatric morbidity in paediatric patients admitted for dengue. It was comparative study they found that 26.7 % of the children had higher depression and anxiety than the control. The children who were admitted for treatment of dengue for less than 2 days reported irritability, aggression, visual hallucinations, and agitation. However, the long-term HuHFWRKDWDMWKHSMEKLDWLFERGLWLRDIWHWRPRW □  
the treatment was not evaluated [12].

In a case report by Jessica et al, they stated the psychiatric KRGDLR RIDPLGGOH DJHG PDKRM GHHG WDFHHEDO □  
haemorrhage during dengue fever. The patient reported with maniac episode and during the examination it was found DIWH □  
that he had suicidal tendencies. The maniac and depressive episodes were clearly evident in the individual. The treatment with the drugs of bipolar disorder improved patient's condition over a period. The researchers hypothesised the association between the invasion of the dengue virus in the brain and the psychiatric disorders [13].

### 0DWHLDOVDG0HWKRGV

#### Study design:

The study was carried out at JLNMCB, Bhagalpur. During a recent epidemic of Dengue fever in Bhagalpur, within a period of 3 months (September to November), a total of 190 dengue-positive patients having psychiatric morbidity were evaluated. To select a sample of patients, a strict inclusion and exclusion criteria was designed.

#### Participants:

The diagnosed cases of Dengue fever within the age range of 6 years to 90 years with mixed gender distribution, having no other uncontrolled physical illness and who gave consent for the study were included in the study.

Patients with clear evidence of previous history of psychiatric illness or patients already on any psychiatric treatment were excluded. Also, patients having fever due to any other cause except dengue were excluded from the study.

All 190 pts were screened for psychiatric morbidity by using MINI 7.0.2 and KSADS for adults and children

respectively at the acute stage. They were then called for follow-up at 3 stages i.e. after 2 weeks, after 6 weeks, and after 3 months.

Amongst the 190 patients diagnosed with dengue, 43 did not fit the inclusion criteria or did not follow up. So, a total of 147 patients were included in this study.

Characteristics of patients included in this study is given in the table no.1

**Table 1:** Characteristics of the patients included in the study.

Age range(yrs)	N=147	Male (% male)	Female (%female)
Jun-18	36	8(22.22%)	28(77.77%)
19-30	63	24(38.09%)	39(61.90%)
31-45	29	11(37.93%)	18(62.06%)
46-60	13	4(30.76%)	9(69.23%)
61-90	6	2(33.33%)	4(66.67%)
		Total = 49(33.33%)	Total = 98(66.66%)

### Assessment procedure:

The diagnosis of Dengue fever was made by the Medicine and Paediatrics department of JLNMC based on clinical symptoms and laboratory investigations like CBC including Platelet count and serology for dengue IgM. The patients appearing to have psychiatric symptoms were referred to our Psychiatric department. The psychiatric assessment was done at 4 stages namely during acute illness, after 2 weeks, after 6 weeks, and after 10 weeks.

### Results

The diagnosis of psychiatric morbidity was recorded as per the stage of dengue fever. The diagnosis and symptoms are enlisted as follows

#### STAGE 1: During acute illness

Patients referred to the Psychiatry department were assessed for psychiatric illness using MINI 7.0.2 for adults and KSADS for children. It was found that most of the patients had severe anxiety and insomnia, some had delirium and one of them had seizure.

Table no.2 gives the details of the psychiatric symptoms reported in the patients during the acute stage of dengue.

#### STAGE 2: After 2 weeks

84 patients who were diagnosed with severe anxiety and 3 patients diagnosed with delirium, and seizures became asymptomatic. The remaining patients still had anxiety and insomnia.

Table no. 3 gives details of the psychiatric symptoms in patients after 2 weeks of dengue diagnosis.

**Table 2:** The psychiatric symptoms reported in the patients during the acute stage of dengue

Psychiatric symptoms	Total no. of patients 147	No. of males 49	No. of females 98
Insomnia	14	6	8
Gad	30	12	18
Panic attack	8	3	5
Depression	8	4	4
Delirium	2	0	2
Seizure	1	0	1
Severe anxiety	84	24	60

**Table 3:** Details of psychiatric symptoms in patients after 2 weeks of diagnosis

Psychiatric symptoms	Total no. of patients 147	No. of males 49	No. of females 98
Insomnia	14	6	8
GAD	30	12	18
Panic attack/ disorder	8	3	5
Depression	8	4	4
Asymptomatic	87	24	63

#### STAGE 3: After 6 weeks

The 3 patients developed obsessive ruminations. Another 2 patients started having severe headaches. One of them had suicidal tendencies. Also, 8 patients lost to follow-up.

Table no. 4 shows the association of psychiatric disorders in patients with dengue fever after 6 weeks.

The last assessment was done, and 2 patients did not follow up. 1 patient started having somatoform disorder.

Table no.5 gives details of Psychiatric symptoms of the patients after 10 weeks of dengue diagnosis

**Table 4:** Association of psychiatric and sleep disorder with dengue fever after 6 weeks

Psychiatric Symptoms	N=52	Male=21	Female=31
INSOMNIA	9	3	6
GAD	24	8	16
PANIC ATTACK/DISORDER	6	2	4
DEPRESSION	7	4	3
Obsessive ruminations	3	3	0
HEADACHE	2	1	1
SUICIDALITY	1	0	1

## Discussion

The study reveals significant psychiatric morbidity among patients diagnosed with dengue fever. Anxiety and insomnia were common symptoms during the acute phase of the illness. The psychological symptoms sustained in a large number of cases, extending far beyond the acute phase, for some evolving into further psychiatric diseases such as OCD, somatoform disorders, and suicidality [14, 15].

The role of mental health surveillance and treatment in dengue patients is of paramount importance. The high incidence of psychiatric symptoms may indicate that dengue fever has a profound and long-lasting impact on mental health, and therefore integrated care with physical and psychological support is mandatory [16,17,18].

Follow-up stages demonstrate that although symptoms in some patients resolved over time, in others the psychiatric problems were either persistent or new [19]. Such persistence and emergence of symptoms make the requirement for mental health assessment and intervention continuous, going beyond the acute phase of dengue fever [20]. Future research that examines larger and more representative samples with longer follow-up periods will help in the acquisition of an understanding of the psychiatric consequences of dengue fever [21].

In general, the present study proves that psychiatric symptoms are frequent in dengue fever patients, and could be both persistent and evolved, and these findings would act as a warning for care to be comprehensive, covering both physical and mental health needs.

## Conclusion

This study underscores the significant psychiatric morbidity experienced by patients diagnosed with dengue fever. The findings reveal that anxiety and insomnia are prevalent during the acute phase of the illness, and a substantial number of patients continue to suffer from psychiatric symptoms long after the acute phase. The emergence of conditions such as obsessive-compulsive disorder, somatoform disorders, and suicidal tendencies in the post-acute phase highlights the long-term mental health impact of dengue fever.

These results emphasize the necessity for comprehensive care approaches that address both the physical and psychological needs of dengue fever patients. The persistence and evolution of psychiatric symptoms over time indicate the importance of ongoing mental health monitoring and intervention well beyond the initial diagnosis and treatment phase.

## Limitations

Including a relatively small sample size and the exclusion of patients with pre-existing psychiatric conditions. Future

research with larger, more inclusive samples and extended follow-up periods is essential. Such research will provide a more detailed understanding of the psychiatric effects of dengue fever and guide the development of integrated care strategies.

## Recommendation

This study demonstrates the critical need for healthcare systems to incorporate mental health support into the management plans for dengue fever patients to improve overall patient outcomes and quality of life.

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## Conflict of interest

None

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