A CROSS-SECTIONAL STUDY ON PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN POST-STROKE PATIENTS IN A TERTIARY CARE CENTRE

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DOCTOR OF MEDICINE

BRANCH XVIII (PSYCHIATRY)

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CERTIFICATE

This is to certify that the dissertation titled **"A CROSS-SECTIONAL STUDY ON PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN POST-STROKE PATIENTS IN A TERTIARY CARE CENTRE"** is a bonafide work of **Dr. B. VELISAIKKO**, is in partial fulfilment of the requirements for **M.D (PSYCHIATRY) (BRANCH -XVIII)** examination of **The Tamilnadu Dr. M.G.R Medical University**, to be held in **MAY 2018**. The period of study was from March 2017 to August 2017.

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DECLARATION

I, **Dr. B. VELISAIKKO**, solemnly declare that the dissertation titled **"A CROSS-SECTIONAL STUDY ON PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN POST-STROKE PATIENTS IN A TERTIARY CARE CENTRE"** is a bonafide work done by me at Chengalpattu Medical College, Chengalpattu, during the period from March 2017 to August 2017, under the guidance and supervision of **Dr. G. AMUTHA, M.D., DCH.**, HOD, Department of Psychiatry, Chengalpattu Medical College. This dissertation is submitted to **The Tamilnadu Dr. M.G.R Medical University**, towards partial fulfilment for M.D. Branch XVIII (Psychiatry) examination.

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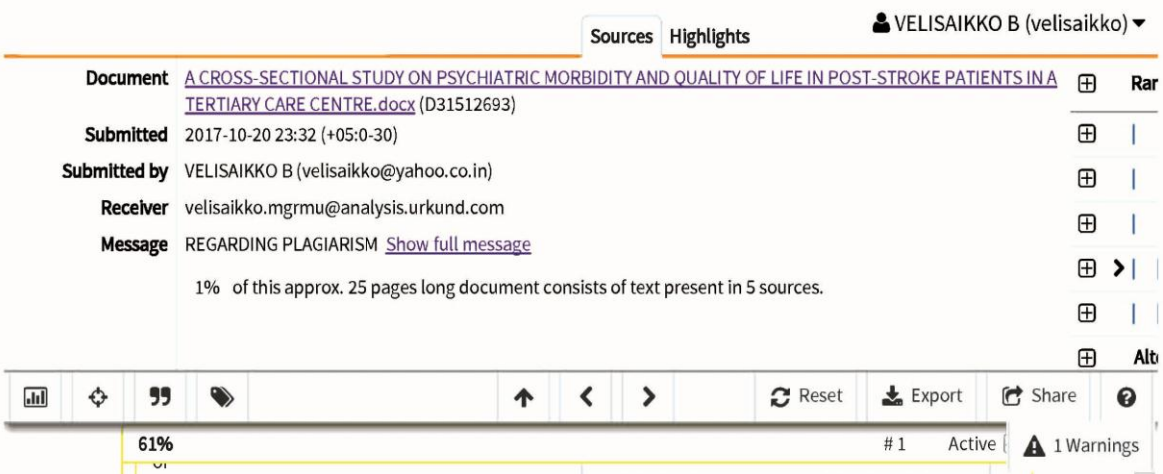

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INTRODUCTION

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According to World Health Organization, stroke is defined as a clinical syndrome consisting of rapidly developing clinical signs of focal or global disturbance of cerebral function lasting for more than 24 hours or leading to death with no apparent cause other than a vascular origin. According to the World Health Organization, 15 million people suffer worldwide each year. Of these, 5 million people die and another 5 million people are permanently disabled. After coronary heart disease and cancer of all types, stroke is the third commonest cause of death worldwide.

It is estimated that 25% to 74% of the 50 million stroke survivors in the world have some physical, cognitive or emotional impairment, and require partial or complete assistance to carry out activities of daily living (Miller et al 2010). In recent years, advances in treatment of stroke reduced mortality rates, which when added to the phenomenon of aging, resulted in growth of the population that survives stroke (Cerniauskaite et al 2012).

STROKE

In general, disease of the vascular system causes a great deal of psychiatric illness, particularly in the elderly population. Stroke is the third commonest cause of death after coronary heart disease and all types of cancer. Each year, total number of people suffering from stroke is increasing. As a result, stroke remains as the most common cause of severe physical disability in the world. (Harris A.I. et al 1971).

CRITERIA FOR DIAGNOSING STROKE (Waterloo et al. 1996)

A stroke should be suspected when

- there is a sudden onset of symptoms
- focal signs and symptoms are present that can be explained by a single lesion of the brain
- there is a loss of function
- signs and symptoms are maximal at onset, then remain stable or improve over time.

However, on occasions,

- symptoms may develop over a few minutes
- symptoms may not be explained by a single lesion

- symptoms may be positive, e.g. jerking, paraesthesia, visual hallucinations
- symptoms may have a sudden onset and then worse over minutes or hours

CAUSES AND PREDISPOSING FACTORS

There are number of causes and predisposing factors for stroke. Among them, atherosclerosis and hypertension are the most common causes. Other causes include hypercoagulable states, venous sinus thrombosis, vasculitis, homocysteinemia, nephrotic syndrome, disseminated intravascular coagulation, systemic malignancy, polycythemia vera, endocarditis and many others. Drugs like oral contraceptives, cocaine and amphetamine may also cause stroke. Among predisposing factors are obesity, hypertension, diabetes, heart disease, raised lipid levels, sedentary life style, smoking and alcohol consumption.

Two pathological processes are involved in stroke namely ischemia (infarction) and haemorrhage. Ischemia is common than haemorrhage by a ratio of approximately 4:1. Ischemia is not only known for its acute onset, but also for its ability to cause enduring disability. Approximately three fourth of the patients with ischemia survive, whereas two thirds of patients

with cerebral haemorrhage may die within one year (Bamford et al 1990). Cerebral ischemia can be classified based on the aetiology or the location. 50% of the ischemic strokes are due to large artery atherosclerosis, 25% due to lacunar infarcts, 20% due to cardiac embolism and 5% due to other causes (Davenport. R et al 2000).

ISCHEMIA (INFARCTION)

Cerebral ischemia is caused by a reduction in blood flow that last longer than several seconds. If blood flow is restored before significant cell injury occurs, patient may experience transient symptoms only. Tissue surrounding the core ischemic region, which is salvageable, is called ischemic penumbra. If blood flow is not restored, ischemic penumbra will eventually turn into infarct.

Large artery atherosclerosis is due to cerebral thrombosis or local emboli. The arteries which are most commonly involved are aorta, carotid arteries, middle cerebral arteries and vertebrobasilar arteries. The occlusion of the arteries may be due to local thrombus formation within the stenotic vessel or thrombo-emboli from distant vessels. Cerebral small vessel disease of the small penetrating arteries supplying the basal ganglia,

thalamus, internal capsule or pons may cause lacunar infarcts. Lipohyalinosis is noted in many patients. Lacunar infarcts are infarction following atherothrombotic or lipohyalinotic occlusion of small arteries in the brain. Hypertension and age are the risk factors for lacunar stroke. Usually they are multiple and microscopic in size.

Based on the location of the ischemia, stroke may be classified as total anterior circulation infarcts, partial anterior circulation stroke, posterior circulation stroke and lacunar infarcts. (Bamford et al. 1991). The prognosis of infarction is much better than for haemorrhage. Approximately 20% die in the acute phase, 20% recover completely and 60% are left with some residual disability. Recovery from embolic stroke is much quicker and better when compared with haemorrhagic stroke. But in both cases, it depends on the site of infarct produced.

Total anterior circulation infarct is caused by occlusion of proximal stem of middle cerebral artery resulting in ischemia in the superficial and deep territories of the middle cerebral artery. It presents with contralateral hemiparesis or sensory deficit, hemianopia and some disorder of higher mental function, depending on the side of the involvement. In some cases, anterior cerebral artery is also affected.

Partial anterior circulation infarct is caused by occlusion of distal stem of middle cerebral artery. They are mostly cortical infarcts, presenting with localized weakness of face, arm and hand or with isolated disorder of higher mental function. They are likely to have early recurrent stroke.

Posterior cerebral artery strokes are mainly due to embolic occlusion of posterior cerebral artery. They are presented with contralateral hemianopia, visual agnosia, spatial disorientation and visual hallucination. Alexia without agraphia results when dominant occipital lobe is affected. Bilateral infarction may cause cortical blindness and Anton's syndrome (denial of visual disability).

Border zone or water shed infarcts occur at boundary between adjacent blood supply. It can be between territories of deep penetrating arteries or between territories of major cerebral arteries. Border zones are vulnerable because of its limits of perfusion of the arteries suppling the adjacent areas. Internal border zone infarcts are subcortical infarcts and occur at places where deep penetrating branches of major cerebral arteries meet with cortical branches. (Donnan et al. 1993). Cortical border zone infarcts occur at the boundary between middle cerebral artery and that of anterior or posterior cerebral arteries. (Fischer et al. 1968). Very small lacunar infarcts may be asymptomatic. However, lacunar infarcts of 0.5 -

1-5 cm in diameter may produce deficits like pure sensory hemiparesis hemisensory stroke, ataxic hemiparesis. These deficits are usually slight and recover rapidly and completely.

HAEMORRHAGE

Intracranial haemorrhages represent 15% of all strokes, and it may be due to subarachnoid haemorrhage from a ruptured aneurysm or a primary intracerebral haemorrhage. Primary intracerebral haemorrhage is commonly associated with hypertension in people who are aged over 60 years. Intraparenchymal haemorrhage usually results from spontaneous rupture of small penetrating arteries. Common sites to be affected are basal ganglia. Deep haemorrhage may affect structures like basal ganglia, thalamus, pons and cerebellum. Blood may dissect into the ventricular space, causing hydrocephalus and thus may increase the mortality. Primary intraventricular haemorrhage is relatively rare.

Haemorrhages usually present with focal neurological deficits, along with features of increased intracranial pressure like headache and vomiting and signs of diminished levels of consciousness. Thalamic haemorrhages may produce contralateral hemiparesis and prominent sensory deficit in all modalities. Pontine haemorrhages may present with

deep coma, quadriplegia, decerebrate rigidity, and pin-point pupils. Death may follow within few hours.

Cerebellar haemorrhages may present with occipital headache, repeated vomiting, and ataxia of gait. Dizziness, vertigo, dysphagia and dysarthria may be present. Early mortality is high and people who survive are usually severely disabled. But there are patients who present with only brief loss of functions making a very good recovery.

TRANSIENT ISCHEMIC ATTACKS

Transient ischemic attack has to be differentiated from stroke. Transient ischemic attack is defined as an acute loss of focal cerebral or monocular function that resolves completely within 24 hours and with no explanation for the symptoms other than inadequate blood supply. Most of them lasts only for a few minutes and recover completely with no residual disability.

Acute management of stroke starts with neuroimaging within the first few hours. Neuroimaging helps the physician to decide if intravenous thrombolysis is to be done. First priority is to differentiate haemorrhagic

stroke, where thrombolysis is contraindicated, from ischemic stroke. Later the extent of ischemic but salvageable brain around the non-viable tissue is assessed.

Neuroimaging may also help to identify the cause of the stroke. The disability which results from stroke is generally a mixture of physical and mental or emotional problems. Emotional problems may be attributable directly to the part of the brain damage sustained during the process of stroke or to the patient's reaction to the disability. In either case, patient's personality and the prevailing life situation also contribute to overall adjustment to the disability.

Overall prognosis depends on the type, side, site and size of lesion. The highest mortality is associated with intracerebral and sub-arachnoid haemorrhage. Stroke produces a wide range of mental and emotional disorders. The neuropsychiatric manifestation produced by stroke may have negative effects on the social functioning, overall quality of life and recovery from the deficits in the stroke survivor. It is therefore necessary to focus on the psychiatric morbidity and quality of life in post stroke patients and help them to lead a self-sustained life and the decrease the economic burden in the society.

STROKE AND QUALITY OF LIFE

Any chronic illness will place the patient and the family under some stress. Stroke, in particular, known to cause impairment in their daily activities, will certainly cause a huge amount of distress. When patients are not able to carry out the daily activities, they feel low and the quality of life deteriorates. With the huge improvements in health care services, more people survive stroke but many have to cope with the physical, psychological, social and functional sequelae, resulting in increased personal costs and this causes huge economic burden.

Stroke causes a significant deterioration of the patient's functioning and worsening of his or her quality of life. Long–term disability caused by stroke is a common problem in all countries and its incidence increases markedly with advancing age. (JA Opara et al. 2010). The assessment of the quality of Life can be used to evaluate the sequelae of stroke. Assessment of quality of life acts as an indicator of the effectiveness of the post–stroke rehabilitation process. Stroke patients and their caregivers perceived deterioration in their quality of life, this being more marked in the women. Older patients obtained poorer scores in physical function. The degree of disability and dysphagia of the patient have the greatest impact on patient’s mental and physical health. (Pinedo. S et al 2016).

According to the biopsychosocial model of chronic illness, the perception of patients with stroke and their caregivers concerning their own health status and quality of life is particularly important. The term health-related quality of life is a concept that reflects the physical, emotional and social behaviours and attitudes of an individual, regarding their previous and current health status. The assessment of quality of life is a complex process, because a wide range of symptoms from sphincter control, motor, cognitive, speech and visual function have to be considered.

In our community, stroke forms a large bulk of population in term of morbidity, since mortality has come down due to better health services. Now the focus of treatment should be rehabilitation and to provide a better quality of life and to lead an independent life. The disability resulting from stroke is attributed the area of brain involved, or the patient's emotional reaction to the sudden onset of illness or the impairment in his daily activities. In either case, patient's personality and the life events can have profound effect on the prognosis. This will also interfere in the rehabilitation process.

It is very important to gain the knowledge and understanding of the prevailing mood of the post stroke patients. Quality of life is related to

multiple factors like degree of physical disability, functional ability, activity levels, independence in carrying out daily activities, social support, pain and mortality rates (Lucy Johnson et al., 2013). Because of this potentially broad impact of stroke, it can be described as a 'negative life event' (Ayerbe et al. 2011).

STROKE AND PSYCHIATRIC ILLNESS

Stroke produce a wide array of mental and emotional disorders. Onset of the psychiatric disorders can be variable. Some of the neuropsychiatric disorders produced by stroke are depression, anxiety disorder, mixed anxiety depression, bipolar disorder, psychosis, personality changes and catastrophic reaction.

Most commonly reported in the literature are post-stroke depression and post-stroke dementia. Assessment for psychiatric symptoms in the first six months of post-stroke patients is especially critical, since most people express emotional problems during this period. Evaluation of the patient's living situation, level of social support, and cultural variables are also critical factors. Post-stroke depression is referred as secondary depression in the psychiatric literature, as opposed to primary or endogenous

depression. Patients with depression may recover spontaneously within 12 months, but untreated patients are at risk for chronic illness. Risk factors include female sex, age less than 60 years, being divorced, alcoholism, non-fluent aphasia, major motor deficit, cognitive deficits, and nursing home residence. Suicidal ideation is reported.

Post-stroke dementia, a type of vascular dementia, is another common psychiatric complication of stroke. Dementia symptoms include memory loss, cognitive deficits, paranoia, visual-spatial dysfunction, language deficits, apraxia, disinhibited behaviour, and poor social judgment. Post-stroke psychotic disorder may present with psychotic symptoms like delusions, hallucinations (which may affect any sensory modalities), ideas of reference, thought disorganization, and irritability. Post-stroke psychotic disorder correlates with right-sided lesions and cortical atrophy. Post-stroke mania is rare, although it may be associated with right-sided stroke. Manic symptoms include expansive or irritable mood, decreased need for sleep, increased goal-directed activity, talkativeness, racing thoughts, excessive laughter or giggling, and poor judgment.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Most commonly reported psychiatric illnesses in the literature are post-stroke depression and post-stroke dementia. Both of them may present simultaneously with overlapping mood and cognitive symptoms. The importance of psychiatric illness complicating the post-stroke period is well established. Integrating assessment for psychiatric symptoms and treating them in post-stroke patients are especially critical in the first 6 months following a stroke, a period which is known for high risk for psychiatric complications. (Bourgeois.J.A et al 2004). Psychiatric and substance abuse history, past treatment with drugs, family history of psychiatric illness, and personal and family history of suicidal behaviour are important items to be assessed. Patient's living situation, educational level, level of social support, and cultural variables are critical factors which have to be assessed. Careful attention to behaviour of caregivers and family members is necessary, especially in patients with cognitive impairment and dysphasia. (Kotila. M.et al 1998).

Depression is the commonest psychiatric illness found in the post stroke patients. Stroke provides a sudden subjective impact which the patient finds difficult to adapt. Even slight interference in verbal communication and in carrying out his daily activities will cause feelings of isolation, threat or loss. The frustrations of physical handicaps and disability, uncertainty about the recovery and the enforced dependency on others are the factors which ensues the depression to progress and continue. Patients diagnosed with post stroke depression have more physical symptoms (Beblo & Driessen 2002). They may present with symptoms like fatigue and sleep disturbances (Williams et al. 2005).

Hackett and Anderson (2005) stated that stroke severity, extent of physical disability and cognitive impairment predicts the depression in later periods. Adverse social factors, especially social isolation, are associated with depression. Left hemisphere infarcts, particularly if located anteriorly, were more likely to produce depression (Robinson et al. 1984). Nys et al. (2005) states that in the acute phase, biological factors determine the depression and in the later phase, social, interpersonal factors and premorbid personality define the mood state. Sometimes, it is difficult to identify depression, when the onset is insidious.

A reactive emotional response to the sudden disability, direct injury to the brain, preceding tendency for depression and previous history of depression are few reasons for the occurrence of depression after stroke. Symptoms like apathy or emotional lability, may mimic the appearance of depression. Other symptoms that may be present are loss of energy, appetite and libido, sleep disturbances, and impaired concentration.

Stroke is associated with suicidal thoughts and intent in 10% of patients (Kishi et al. 1996). Teasdale & Engberg et al (2001) found the risk of suicide to be doubled after stroke. Depression may lead to poor motivation for rehabilitation, and is associated with poor outcomes (Williams et al 2005). It has a huge impact on the caretakers and places a huge economic burden on them.

Depression inherently increases the risk of having further stroke. (Williams et al. 2005). In many patients, anxiety may also accompany the depression. Gustafson.Y et al (1995), stated that 30% of stroke patients experience depression, both early and late after stroke. But, only a minority of the patients are diagnosed and even fewer are treated in clinical settings.

Salter et al (2007) found that neurological deficits, particularly when associated with dysphasia and dementia, may experience many overlapping somatic, cognitive, and affective symptoms. Early screening and diagnosis of depression is important as it may lead to a good prognosis. Depression after stroke is also related to high mortality risk. (Morris et al. (1990).

Probably one-third to half of patients suffer from depression in the year after stroke, and that depression is associated with adverse sequelae and poor quality of life. Few studies have attempted to prevent depression after stroke. Most have used antidepressants and were prescribed prophylactically to all patients, whether depressed or not, to see if patients on drug treatment are less likely to become depressed over subsequent months. Rasmussen et al. 2003, in his study of 137 patients, didn't find any significant results as many patients dropped out in this study. Hackett et al. (2005) found a significant finding favouring the use of antidepressants prophylactically in post stroke patients to prevent depression.

Rinu et al (2010) in her prospective study, interviewed the patients, 1 month after the stroke. She concluded that the mean age was 54.3 years and anxiety was seen in 39 patients (24%) and 60 patients (37%) had

depression. Functionally dependent patients were more likely to be older and had severe stroke. The study concluded that presence of anxiety, depression, and functional dependence were associated with impaired quality of life. One hundred twenty-five patients (77.2%) had an ischemic stroke. In the univariate analysis, presence of anxiety and depression had negative correlation with quality of life in the physical, social, and environmental domains. Patients with impaired quality of life were likely to be functionally dependent on other people. Age also had a negative correlation with functional independence score. Other demographic variables and stroke factors did not affect functional independence in this study.

Generalised anxiety disorder is found in about 25% of stroke patients (Castillo et al. 1995) and is usually associated with depression. House et al. (1991) identified agoraphobia and social withdrawal in few cases. Anxiety is generally present because of the fear of looking conspicuous on account of the disabilities, or fear of recurrence. Tension, worry and lack of energy and interest are common complaints. A sense of worry and apprehension may always occupy the patients when doing a task. They may become anxious and agitated. This might cause anticipatory anxiety. Some can have free floating anxiety, with no specific event precipitating it.

Anxiety affects about 20% of stroke survivors. Post stroke depression, pre-stroke anxiety and depression are the factors that are associated with post stroke anxiety and they can be targeted by treatment. In the post stroke patients, generalized anxiety disorder, phobic disorder and obsessive-compulsive disorder are found in them. Factors like female sex and pre-stroke depression are significant independent variables which may predict post stroke anxiety disorder. In terms of symptom profile, stroke survivors with anxiety are likely to have disturbances in sleep and appetite. Prevalence of anxiety disorder is markedly higher after stroke than in the general population. (Cumming et al 2016)

Post-stroke anxiety disorders have received little attention when compared to post stroke depression. The core symptoms of post-stroke anxiety are excessive anxiousness or worry, and difficulty in controlling worries, apprehension, restlessness, decreased energy, poor concentration, irritation, nervous tension, and insomnia. The prevalence of post-stroke anxiety, with or without depression, is higher in hospital settings than in community settings. One study showed that the prevalence of post-stroke anxiety decreased over time (33% at 3 months, 18% at 2 years).

Early-onset anxiety is more often associated with previous psychiatric disorders than late-onset anxiety. It has been found that early-onset anxiety may be a recurrence of a pre-stroke generalized anxiety disorder. Post-stroke anxiety by itself does not influence functional or cognitive recovery, but it is associated with poor social functioning and quality of life. Factors that are associated with post stroke anxiety are post stroke depression, left hemispheric cortical infarcts and posterior infarcts.

Mania too occurs after stroke, but not as frequently as post stroke depression. Mania may be associated with right temporal lesions (Starkstein et al. 1990). Hypomanic episodes are also reported (Van der Lugt & De Visser 1967). The episodes of mania often reported within days or weeks after the stroke. McGilchrist et al. (1993) reported a case a mania following thalamic infarction. Thalamic infarctions lead to metabolic hypofunction in the frontal lobes, which results in the abrupt onset of cyclical mood disorder accompanied by features of frontal lobe dysfunction.

Cognitive impairment may follow stroke. For some time, global confusion and disorientation may be present. Once the initial clouding of consciousness has settled down, the true extent of cognitive dysfunction

will be revealed. Cognitive deficits are severe and extensive when the clouding of consciousness persists for long periods. It is difficult to assess the extent of intellectual impairment, if the patient is dysphasic. Cognitive deficits may have an impact on rehabilitation. Disturbances of language and apraxia, which cause frustration, may also affect rehabilitation process. Patients with expressive language loss, but good comprehension will have better outcome.

Therapist has to distinguish depression from loss of confidence and from the emotional lability associated with intellectual impairment. One has to be aware that sometimes, in severely disabled patients, feelings of resignation and futility are realistically based and it has to sensitively dealt with. Some elderly patients are so frail, and feel that the chances are genuinely against them, and that their wish 'not to bother him or her' deserves to be treated with proper respect.

Post stroke dementia is a term introduced to describe those patients who suffer from global cognitive impairment after stroke (Leys et al. 2005). All types of dementia irrespective of their causes may present after stroke. Among them, the commonest are vascular dementia and Alzheimer's disease. Prevalence of post stroke dementia is estimated and

they vary widely, from 6 to 32%. Stroke doubles the risk of new-onset cases of dementia over the years after the stroke (Kokmen et al. 1996). Risk factors for post stroke dementia are lower educational level, pre-stroke cognitive decline and more severe stroke. Left hemisphere strokes are more likely to be associated with dementia. Dementia after stroke is more common in those who have silent infarcts (i.e. infarcts not associated with any corresponding neurological defect), global cortical atrophy or white matter disease (Leys et al. 2005).

Bilateral strokes involving the basal forebrain can produce a dementia, because it causes severe executive dysfunction and memory loss. Bilateral thalamic strokes also produce dementia. Bilateral medial thalamic infarctions typically cause apathy, vertical gaze disturbance, and subcortical dementia. (Kumral et al.2001).

Desmond et al. (2002) in his study found that post stroke dementia has a serious adverse effect on both the mortality and morbidity of stroke and increases the risk of stroke recurrence. Deficits in cognitive and executive function are most serious of the sequelae of stroke, delaying and compromising attempts at rehabilitation. They may appear less obvious

than the physical handicap, but often prove to be the main factors responsible for failure to regain an independent life.

More than one-fourth stroke patients may develop immediate or delayed vascular cognitive impairment or vascular dementia during the course of illness. Stroke may cause vascular changes which may initiate neurodegenerative changes leading to cognitive impairment. Risk factors for cognitive impairment and dementia after stroke are multifactorial. They include old age, family history, genetic vulnerability, low educational status, vascular comorbidities, prior transient ischemic attack or recurrent stroke. Controlling risk factors and treating them are necessary to reduce the burden of cognitive dysfunction after stroke. (Raj Kalaria et al 2016).

Chausson et al (2010) in his study, conducted on 293 stroke patients, examined the cognitive function 5 years after the stroke and found that 58.9% patients suffered from some form of cognitive impairment.

Personality changes after stroke are among the most troublesome of the sequelae of stroke. They may be because of the direct brain damage. Vascular changes are probably responsible for the personality changes and

may progress even after the focal sequelae of the stroke improve and may be predictor for progressive dementing illness. The patient may find it difficult to adjust to new circumstances, and trivial matters may make him anxious, irritable or depressed. Confrontation with new tasks or with social demands may precipitate catastrophic reaction.

The patient may become abusive and irritable and become uncooperative if asked to make any effort. Anderson et al. (1995) found after 1 year after stroke, half of the patients had slowed down, worried, miserable or complaining of aches and pains, and over one-third were withdrawn, irritable, fearful or unpredictable. Stone et al. (2004) in his study found that greater changes in personality were reported in patients who were depressed, who were not able to carry out activities of daily living, and who didn't have adequate social support. Patients with total anterior circulation strokes are prone for personality changes.

Caregiver burden is another entity which has to be focused, because often the spouse of the patient is also old and may express their concerns about the challenge and hardships when dealing the patients. Caregivers may be worried and may show subtle depressive symptoms. The

anticipatory worries of the spouses may have an impact on the outcome of the patients. (Knapp & Hewison et al 1999)

Emotionalism is heightened tendency to cry, often uncontrollably and with little warning or provocation. It is caused by pseudobulbar palsy resulting from bilateral lesions of the corticobulbar tracts. In those patients, crying may occur with little or no provocation. House et al. (1989) found in his study that at 6 months, 21% of patients reported emotionalism, and at 12 months 11%. All of them showed crying as the principal problem, but few had pathological laughter in addition to it. Onset is generally during the 4–6 weeks following the stroke, with a tendency to decrease over the following year.

Rabin et al (1991) estimated that 1-2% of the post stroke patients may have symptoms of non-affective psychotic illness. Delusions is found in 4% patients, with onset within a few days of stroke, and is often associated with other behavioural problems like irritability, angry outburst and agitation. All patients with delusional ideas had right hemisphere stroke, particularly in posterior temporoparietal region. Few even presented with delusional misidentification. (Price and Mesulam et al. 1985). Levine and Finklestein (1982) also identified the relationship

between cerebrovascular lesions of the right hemisphere, specifically of the right temporoparieto-occipital areas, and the development of psychotic illnesses later. Kumral & Ozturk et al (2004) in his study found that psychosis developed acutely with formed auditory and visual hallucinations. Some presented with seizures along with persecutory delusions and agitation.

Cummings et al (1993) in his found that thalamus, striatum, and pallidus infarcts can cause psychosis and the prefrontal cortical connection systems namely dorsolateral and anterior cingulate may mediate in the psychotic symptoms. Kitabayashi et al (2006) presented a case of schizophrenic psychosis following right putaminal lacunar infarction. This had caused lesion in the prefrontal dorsolateral and orbital lateral circuits. Ischemia in the thalamus can also cause stroke psychosis (McGilchrist et al 1993). However, Rabins et al (1991) found a greater frequency of right frontoparietal lesions in patients with post-stroke psychosis and a greater degree of subcortical atrophy. Psychosis of organic vascular cause is confirmative when there is a sudden onset of the psychotic symptoms, the demonstration in the neuroimaging findings of an acute vascular event and the reversible character of the symptoms.

Rabins et al (1991) stated that association of right hemisphere infarcts with post stroke seizures is a risk for psychosis in later life. Pre-existing subcortical atrophy appeared to be an additional risk factor. Hallucinosis is another phenomenon, where the patient has insight into the unreal nature of the hallucinated material, and is associated with lesions in the midbrain and pons. Such hallucinosis is also called organic hallucinosis and can occur in the visual or auditory modalities. They are typically complex and vivid, and usually resolves within days or weeks.

Geller & Bellur et al (1987) in his study found psychosis is associated with midbrain lesion. Hallucinations may be seen after cortical strokes. Lampl et al. (2005) found that patients who had auditory hallucinations in the early post stroke period had right temporal lobe lesion. Psychosis presented in the early days after stroke may resolve spontaneously without medications. If antipsychotics are prescribed, potential risks should be discussed with the patient and the family.

Ravi Rana et al (2014), in their study, found that prevalence of psychiatric illnesses was 49%. Depression is found more in the left hemisphere lesions (61.8%) and anxiety disorder is found common in the right hemisphere lesions (62.5%). Psychosis, mania, apathy and

catastrophic reaction are more common in right hemisphere lesion.

Post stroke patients may have an impact on the overall quality of life. Poorer quality of life may in turn lead to psychiatric illness. F B van de Weg et al (1999) found in his study that that stroke patients with depression have significantly lower functional scores both at onset and after six months. They also stressed that depression is under diagnosed and the possible beneficial effect of antidepressants in depressed stroke patients.

Nuray et al (2006) in their study, found the quality of life poorer when compared to the general population and patients aged between 61 to 71 years had the lowest scores in relation to functional status and general heath perception. This may be attributed to the general age-related decline of physical activity. Men had high scores of quality of life as compared to women, which is similar to the observations made in other studies. The reasons for low scores in women could be greater domestic responsibilities. Patients who continue to work had high scores of quality of life.

Raju et al (2017) in his study stated that stroke survivors who had minor strokes had good outcome. Apart from prevalence of minor strokes, the long duration of stroke enabled survivors to adopt certain coping strategies to deal with anxiety, depression and other emotional problems. Patients who went back home rather than to nursing homes or other institutions, had good outcome in terms of quality of life. In this study, measures of communication and cognition were assessed. Severe stroke and presence of depression influenced functional independence in the present study. In few people, despite the absence of anxiety and depression, functional independence was still affected. A likely explanation for this, from a psychological point of view, could be the fear and worry of having another attack. This would lead to avoidance of activities that patients would normally do with ease. Finally, he concluded that the presence of anxiety, depression, and functional dependence were associated with impaired quality of life. Older age, stroke severity and presence of some psychopathology resulted in decreased independence. By treating the psychiatric illnesses, one can provide an opportunity to improve quality of life by identifying and treating anxiety and depression in high-risk stroke patients.

AIMS AND OBJECTIVES

AIM

To estimate the prevalence of psychiatric illness in post-stroke patients in a tertiary care centre.

OBJECTIVES

- To find out the variation in the sociodemographic profile in the post-stroke patients.
- To find the association of psychiatric illness with the side, site and type of
  lesion.
- To find the association of psychiatric illness with duration of illness and the number of episodes of stroke.
- To find the relationship of psychiatric illness with quality of life.

MATERIALS

AND

METHODOLOGY

MATERIALS AND METHODOLOGY

SETTINGS:

This study was conducted in Department of Neurology at Chengalpattu Medical College and Hospital, Chengalpattu for a period of six months from March 2017 to August 2017. Out-patients, who were getting treatment from the Neurology Out-patient Department, were selected for the study. The study was approved by the Ethical Committee of this college.

SAMPLE:

Hundred consecutive patients, who fulfilled the inclusion and exclusion criteria, were selected for this study.

STUDY DESIGN:

Cross-sectional study

INCLUSION CRITERIA:

- Out-patients attending Neurology Out-patient Department with a diagnosis of stroke.
- Age above 18 years.
- Patients willing to provide consent.
- Diabetes and Hypertension.

EXCLUSION CRITERIA:

- Patients not willing to provide consent.
- Terminally ill patients.
- Patients with history of psychiatric illness and substance use disorders.
- Other neurological and neurodevelopmental disorders.
- Other chronic medical and surgical illnesses.

INTERVIEW:

All participants were selected consecutively, who attended Neurology Out-patient Department. Written informed consent was obtained from all the participants. All the participants were interviewed, along with their attenders. Sociodemographic profile and the history of the illness was obtained. Details about the onset and course of illness is noted. Then the side, site and type of lesion is documented from their old records. Family history of psychiatric illness, substance use and stroke were enquired. Quality of life and presence of psychiatric illness was also assessed using the appropriate questionnaire.

INSTRUMENTS USED:

- Semi-structured proforma
- ICD-10
- MINI International Neuropsychiatric Interview(MINI)
- World Health Organisation Quality of Life Inventory (WHO-QOL BREF)

SEMI-STRUCTURED PROFORMA

This proforma was prepared for this study, which consists of name, age, sex, place, socioeconomic status, education, occupation and marital status. Proforma also contains duration of illness, side, site and type of lesion, number of episodes of stroke, co-morbid physical illnesses and substance use.

MINI

The Mini-International Neuropsychiatric Interview (M.I.N.I.) is a short structured diagnostic interview, developed jointly by psychiatrists and clinicians in the United States and Europe, for diagnosis of psychiatric disorders according to DSM-IV and ICD-10. With an administration time of approximately 15 minutes, it was designed to meet the need for a short but accurate structured psychiatric interview for multicentre clinical trials and epidemiology studies.

The M.I.N.I. is divided into modules identified by letters, each corresponding to a particular diagnostic category. At the beginning of each

diagnostic module (except for psychotic disorders module), screening questions corresponding to the main criteria of the disorder are presented in a gray box. At the end of each module, diagnostic boxes permit the clinician to indicate whether diagnostic criteria are met.

WHO-QOL BREF

Quality of life can be described as the dynamic interaction between the external conditions of the individual's life and the one's own internal perception of their conditions. Quality of life is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.

The WHO QOL quality of life assessment was developed by the WHOQOL Group with fifteen international field centres, simultaneously, in an attempt to develop a quality of life assessment that would be applicable cross-culturally. The WHOQOL-BREF is based on four domains namely physical health, psychological health, social relations and environment. The WHOQOL-BREF contains a total of 26 questions. In addition to the items in the four domains, two items from the Overall

quality of Life and General Health facet have been included. The WHO QoL-BREF is self-administered questionnaire in which items are rated on a 5-point scale.

STATISTICAL ANALYSIS

Analysis was done using Statistical Package for the Social Sciences (SPSS) version 16.0. Descriptive statistics were used to compute means and standard deviations for numerical variables and frequencies for nominal and ordinal variables. The relationship between categorical responses and variables were evaluated using chi-square test. In all statistical tests, a value of $P < 0.05$ was considered significant. Its value reflects the strength of this relationship.

RESULTS

RESULTS

Table 1

PREVALENCE OF PSYCHIATRIC DIAGNOSIS

Diagnosis	Frequency	Percent	Valid Percent	Cumulative Percent
Depression	16	16.0	16.0	16.0
Mixed Anxiety Depression	5	5.0	5.0	21.0
Generalised Anxiety Disorder	8	8.0	8.0	29.0
Psychosis	2	2.0	2.0	31.0
Dementia	3	3.0	3.0	34.0
Others	4	4.0	4.0	38.0
No Psychopathology	62	62.0	62.0	100.0
Total	100	100.0	100.0	

Table 1 shows that the prevalence of psychiatric illness as 38%. Depression has maximum prevalence at 16%. Others which includes organic personality disorder has 4%. 62% didn't have psychiatric illness.

Chart 1

PREVALENCE OF PSYCHIATRIC DIAGNOSIS

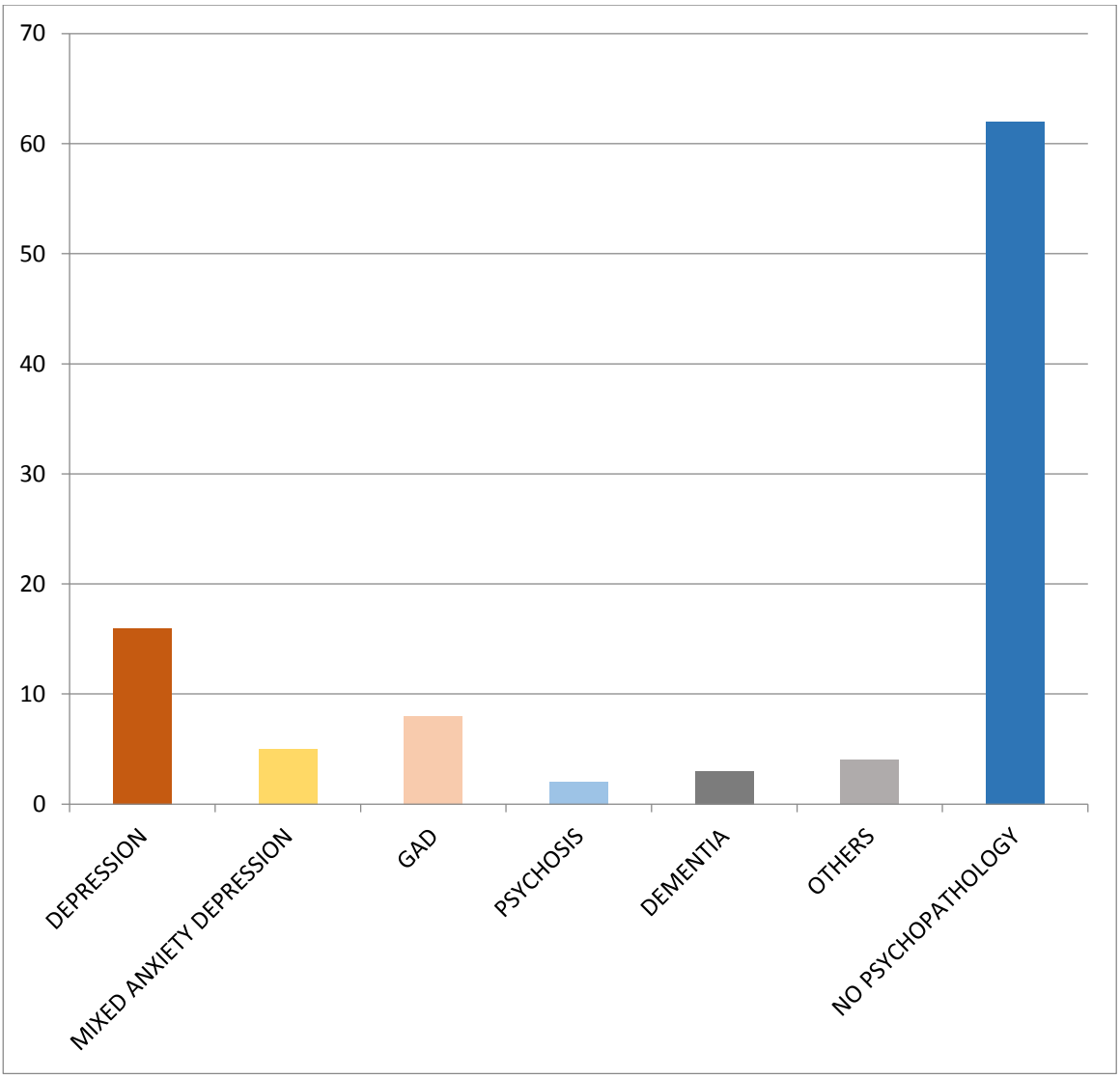


Chart 1 shows depression has maximum prevalence at 16%. Next in order are generalized anxiety disorder, mixed anxiety depression. 62% didn't have psychiatric illness.

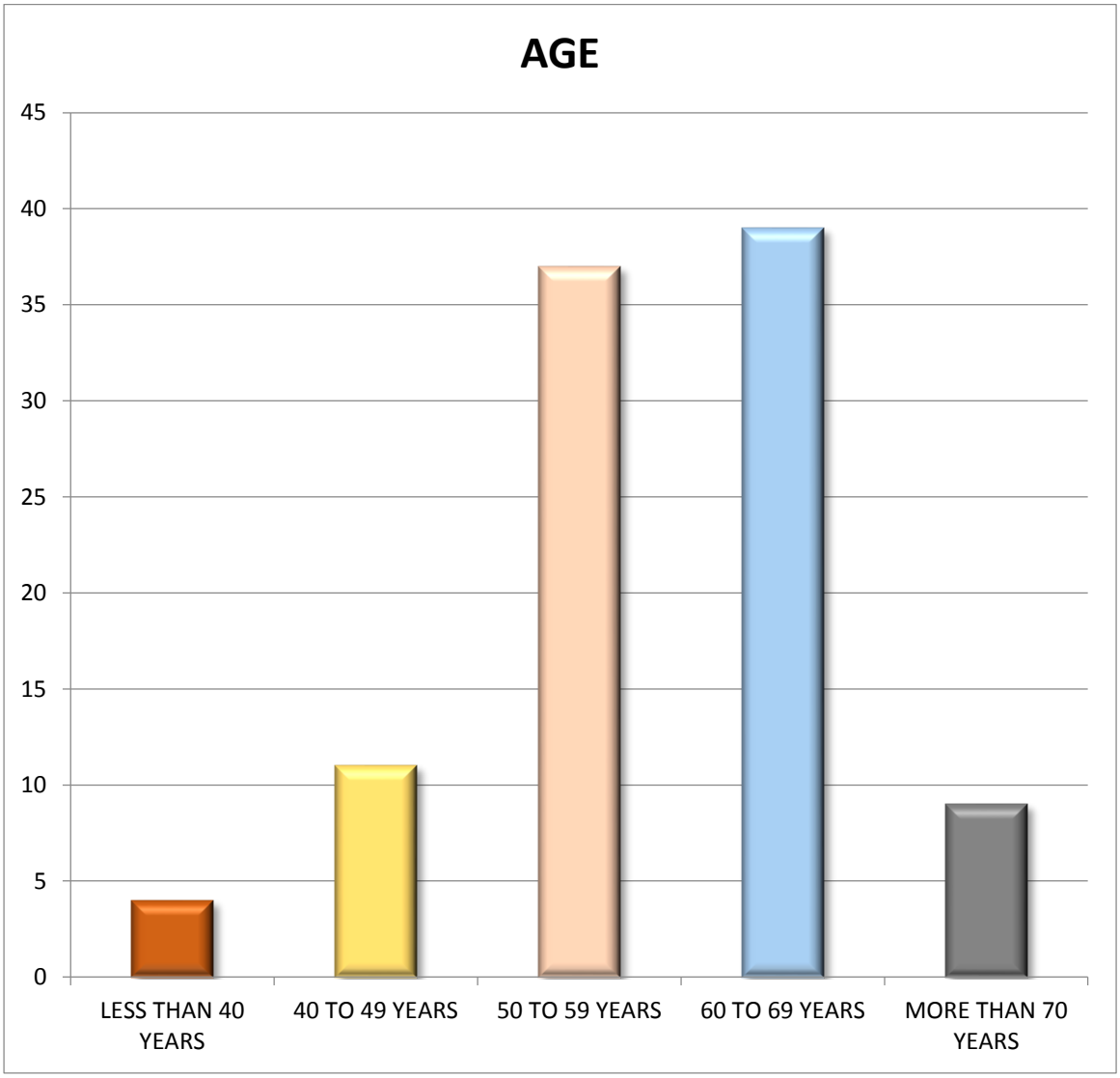
Table 2

AGE

Age	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 40 years	4	4.0	4.0	4.0
40 to 49 years	11	11.0	11.0	15.0
50 to 59 years	37	37.0	37.0	52.0
60 to 69 years	39	39.0	39.0	91.0
More than 70 years	9	9.0	9.0	100.0
Total	100	100.0	100.0	

Table 2 shows frequency was high among the age groups 50 to 59 years and 60 to 69 years. The above two age groups represented 76% of the psychiatric morbidity.

Chart 2



In chart 2, Prevalence was high among the age groups 50 to 59 years and 60 to 69 years. The above two age groups represented 76% of the psychiatric morbidity.

Table 3

GENDER VARIATION

Gender Variation	Frequency	Percent	Valid Percent	Cumulative Percent
Male	59	59.0	59.0	59.0
Female	41	41.0	41.0	100.0
Total	100	100.0	100.0	

Table 3 shows frequency of stroke is 59% in males and 41% in females. Among them, males contributed 57.89% and females contributed 42.10% to the psychiatric illness.

Chart 3

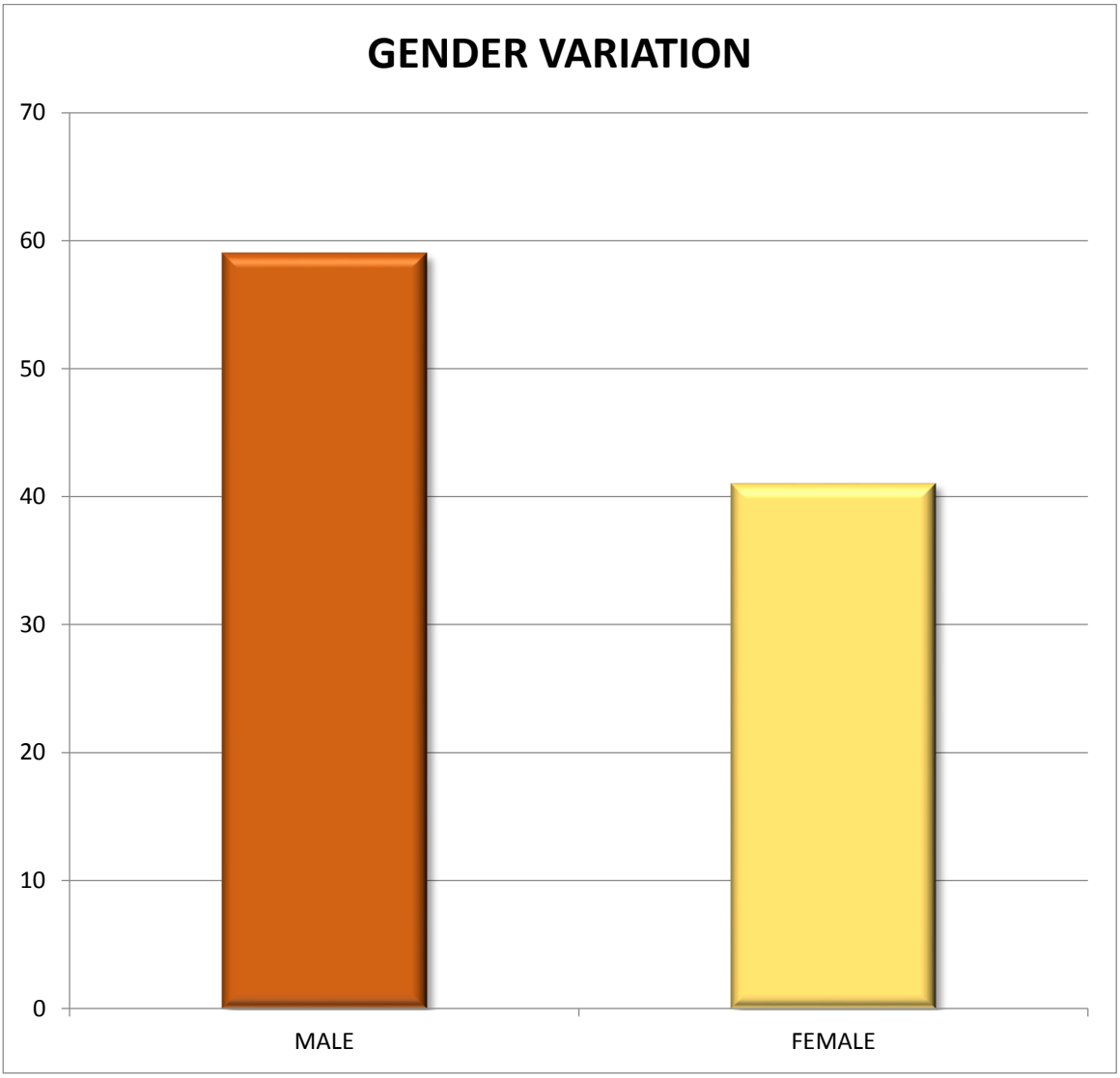


Chart 3 show that males contributed 57.89% and females contributed 42.10% to the psychiatric illness in our sample population.

Table 4

DOMICILE

Domicile	Frequency	Percent	Valid Percent	Cumulative Percent
Rural	57	57.0	57.0	57.0
Urban	43	43.0	43.0	100.0
Total	100	100.0	100.0	

Table 4 shows, 57% from rural areas and 43% from urban areas. Patients from rural areas contributed 64.31% and from urban areas contributed 36.84%.

Table 5

SOCIOECONOMIC STATUS

SES	Frequency	Percent	Valid Percent	Cumulative Percent
Lower	49	49.0	49.0	49.0
Middle	38	38.0	38.0	87.0
Higher	13	13.0	13.0	100.0
Total	100	100.0	100.0	

Patients who belonged to lower economic status, represented 49% of the sample, but contributed to 65.78% towards psychiatric illness.

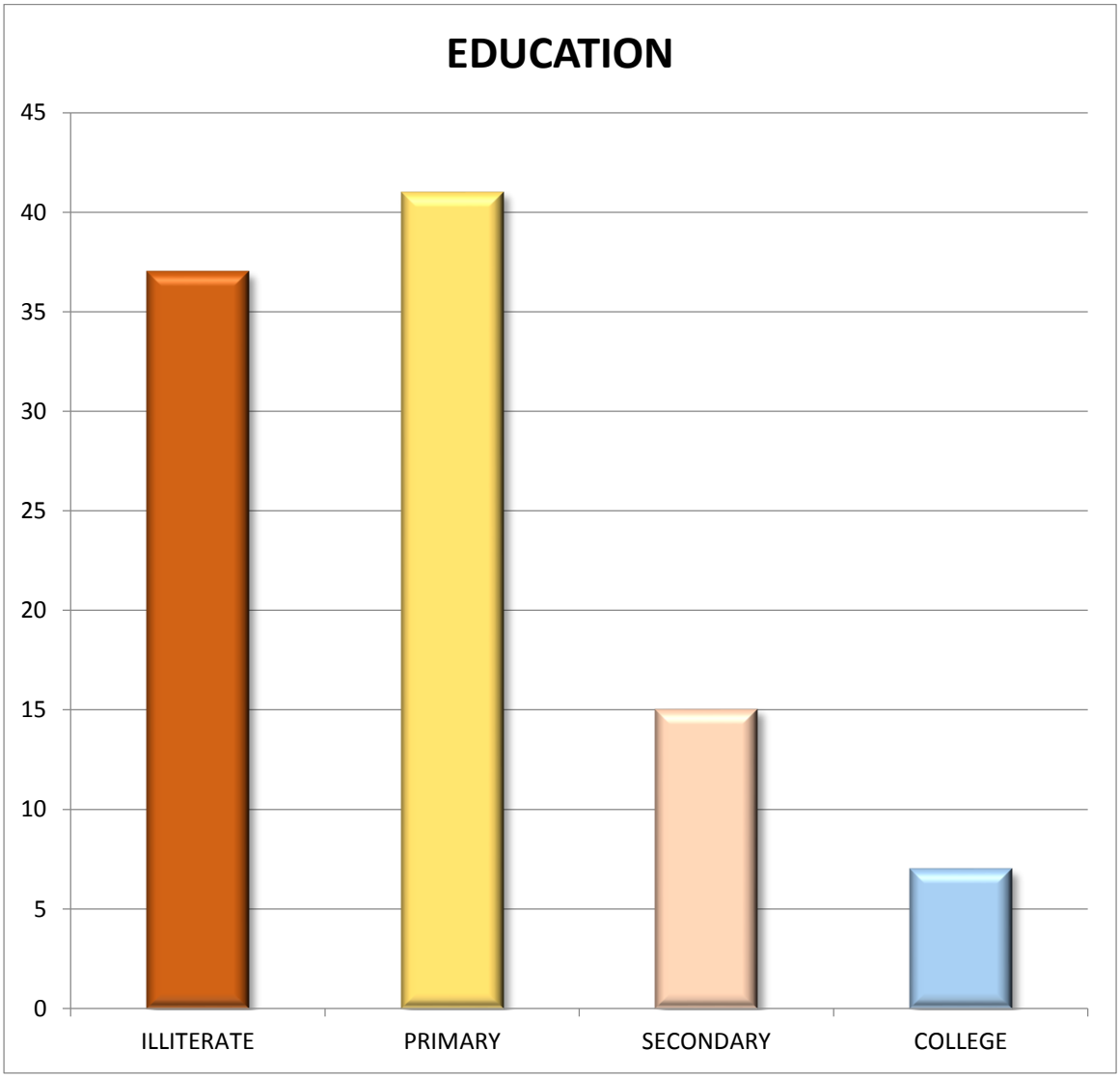
Table 6

EDUCATION

Education	Frequency	Percent	Valid Percent	Cumulative Percent
Illiterate	37	37.0	37.0	37.0
Primary	41	41.0	41.0	78.0
Secondary	15	15.0	15.0	93.0
College	7	7.0	7.0	100.0
Total	100	100.0	100.0	

In table 6, patients who are illiterate or who had completed primary schooling alone (28 patients) had a high representation (73.68%) in psychiatric morbidity.

Chart 4



Patients who are illiterate or who had completed primary schooling alone (73patients) had a high representation (73.68%) in psychiatric morbidity.

Table 7

OCCUPATION

Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
Unemployed	50	50.0	50.0	50.0
Employed	50	50.0	50.0	100.0
Total	100	100.0	100.0	

28 patients of the 38 patients are not employed. (73.68%).

Table 8

MARITAL STATUS

Marital Status	Frequency	Percent	Valid Percent	Cumulative Percent
Unmarried	2	2.0	2.0	2.0
Married	83	83.0	83.0	85.0
Widow/Widower	15	15.0	15.0	100.0
Total	100	100.0	100.0	

Majority were married (83%), 2% were unmarried.15% people, who lost their spouses had psychiatric illness at 66.67% among them.

Table 9

PSYCHIATRIC DIAGNOSIS VS SIDE OF LESION

PSY DIAG	Side of Lesion			Total
	Right	Left	Bilateral	
Depression	7	9	0	16
Mixed Anxiety Depression	3	2	0	5
Generalised Anxiety Disorder	7	1	0	8
Psychosis	1	1	0	2
Dementia	2	0	1	3
Others	2	1	1	4
No Psychopathology				62
TOTAL	22	14	2	100

In Table 9, 57% patients had right hemisphere lesions. Depression is common in left hemisphere lesions. Anxiety disorder is common in right hemisphere lesion.

PSYCHIATRIC DIAGNOSIS VS SIDE OF LESION

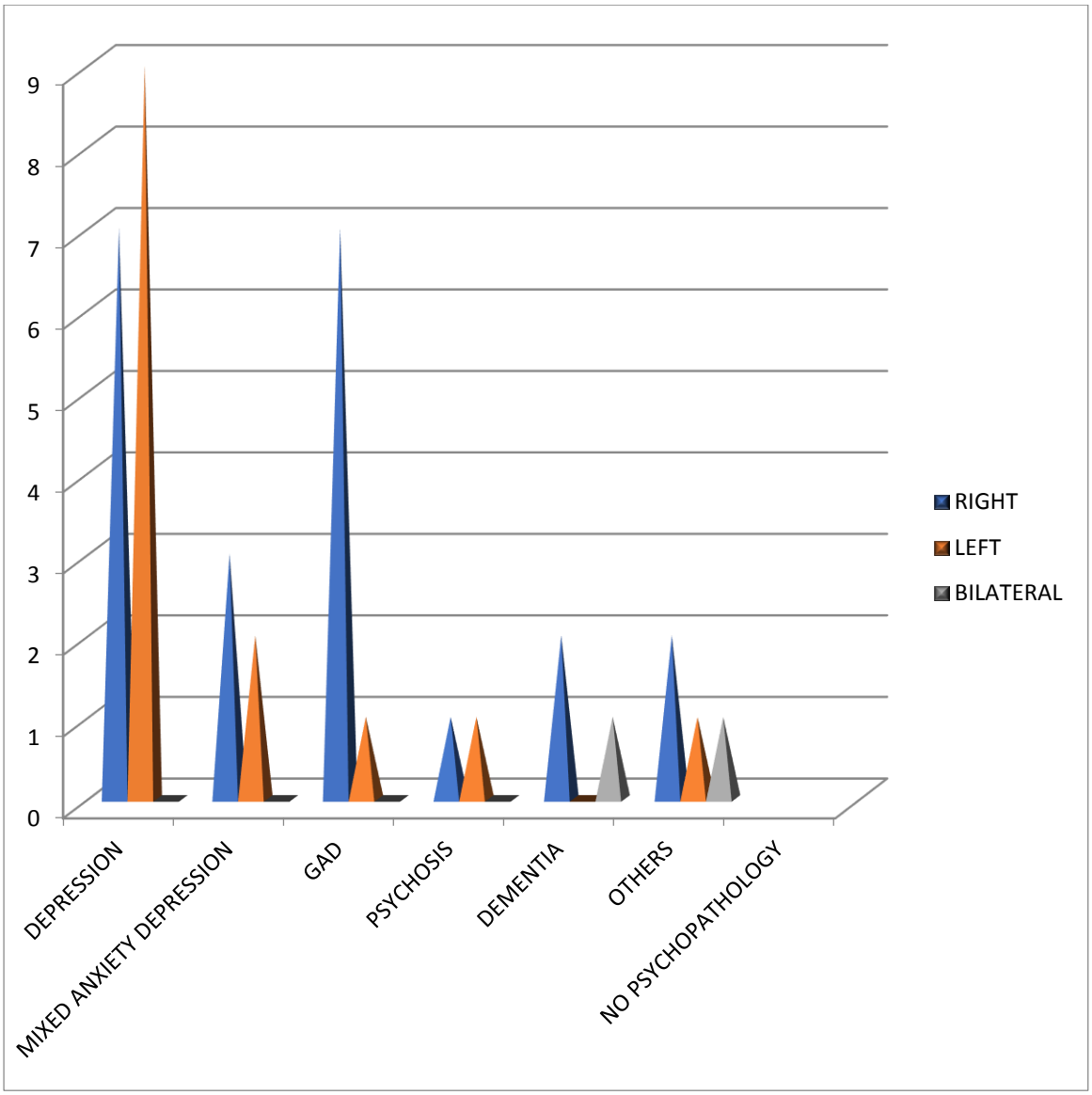


Chart 6 shows that 57% patients had right hemisphere lesions. Depression is common in left hemisphere lesions. Anxiety disorder is common in right hemisphere lesion.

Table 10

PSYCHIATRIC DIAGNOSIS VS SIDE OF LESION

Chi square chart

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	33.138[a]	12	.001
Likelihood Ratio	18.211	12	.109
Linear-by-Linear Association	.079	1	.778
N of Valid Cases	100		

a. 17 cells (81.0%) have expected count less than 5. The minimum expected count is .04.

There is statistically significant association between psychiatric illness and side of lesion as p value is .001

Table 11

PSYCHIATRIC DIAGNOSIS VS SITE OF LESION

PSY DIAG	Site of lesion						Total
	Internal capsule	Basal ganglia	Cerebral hemisphere	Corona radiata	Thalamus	Lacunar infarcts	
Depression	7	2	5	1	1	0	16
Mixed Anxiety Depression	4	0	0	0	0	1	5
Generalised Anxiety Disorder	3	0	2	1	1	1	8
Psychosis	0	0	2	0	0	0	2
Dementia	2	0	1	0	0	0	3
Others	2	0	2	0	0	0	4
No Psychopathology	34	7	3	1	6	11	62
TOTAL	52	9	15	3	8	13	100

In Table 11, 75% patients, who had depression, had lesions in cerebral hemisphere and internal capsule. Patients who had psychosis, dementia and organic personality disorder had lesion in the cerebral hemisphere.

Table 12

PSYCHIATRIC DIAGNOSIS VS SITE OF LESION

Chi square test

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	36.951[a]	30	.179
Likelihood Ratio	37.991	30	.150
Linear-by-Linear Association	.246	1	.620
N of Valid Cases	100		

a. 37 cells (88.1%) have expected count less than 5. The minimum expected count is .06.

The association between psychiatric illness and side of lesion is not statistically significant as p valve is .179

Table 13

PSYCHIATRIC DIAGNOSIS VS TYPE OF LESION

PSY DIAG	Type of lesion		Total
	Ischemia	Haemorrhage	
Depression	11	5	16
Mixed Anxiety Depression	5	0	5
Generalised Anxiety Disorder	4	4	8
Psychosis	0	2	2
Dementia	3	0	3
Others	4	0	4
No Psychopathology	44	18	62
TOTAL	71	29	100

Table 13 show that ischemia represents 71.05% and haemorrhage represents 28.94%. almost all disorders are common in ischemic strokes, except for psychosis, which is common in haemorrhagic strokes.

Chart 6

PSYCHIATRIC DIAGNOSIS VS TYPE OF LESION

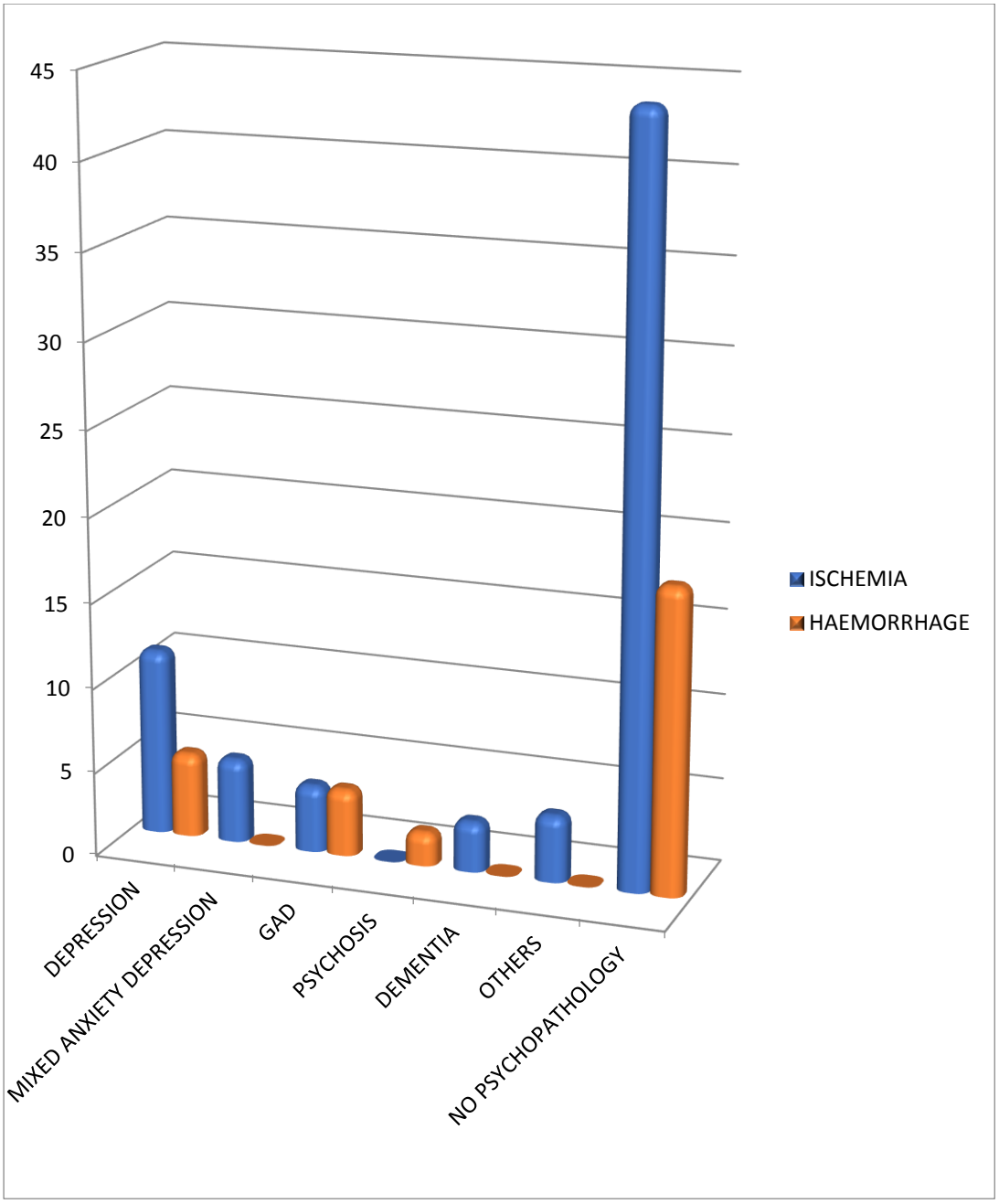


Chart 6, shows almost all disorders are common in ischemic strokes, except for psychosis, which is common in haemorrhagic strokes.

Table 14

PSYCHIATRIC DIAGNOSIS VS TYPE OF LESION

Chi square test

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	11.551[a]	6	.073
Likelihood Ratio	14.763	6	.022
Linear-by-Linear Association	.074	1	.785
N of Valid Cases	100		

a. 10 cells (71.4%) have expected count less than 5. The minimum expected count is .58.

The association between psychiatric illness and type of lesion is not statistically significant as p valve is .073

Table 15

PSYCHIATRIC DIAGNOSIS VS DURATION OF ILLNESS

PSY DIAG	DURATION				Total
	< 1 Year	1 to 5 Years	5 to 10 Years	> 10 Years	
Depression	1	6	8	1	16
Mixed Anxiety Depression	0	3	2	0	5
Generalised Anxiety Disorder	1	6	0	1	8
Psychosis	0	1	1	0	2
Dementia	0	0	2	1	3
Others	0	0	4	0	4
No Psychopathology	13	41	8	0	62
TOTAL	15	57	25	3	100

From the Table 15, as duration of stroke increases, prevalence increase. 16 patients (28.07%) were there in the 2 to 5 years. 17 patients (68%) were there in the 5 to 10 years. 3 patients (100%) were there in the group of patients who had more than ten years illness. Percentage given is the result when compared with same duration group in the sample.

Table 16

PSYCHIATRIC DIAGNOSIS VS DURATION OF ILLNESS

Chi square test

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	46.889[a]	18	.000
Likelihood Ratio	45.015	18	.000
Linear-by-Linear Association	10.860	1	.001
N of Valid Cases	100		

a. 24 cells (85.7%) have expected count less than 5. The minimum expected count is .06.

As p value is .000, the association between psychiatric illness and duration of illness is statistically significant.

Table 17

PSYCHIATRIC DIAGNOSIS VS COMORBIDITY

PSY DIAG	Comorbid		Total
	Absent	Present	
Depression	8	8	16
Mixed Anxiety Depression	0	5	5
Generalised Anxiety Disorder	4	4	8
Psychosis	1	1	2
Dementia	0	3	3
Others	0	4	4
No Psychopathology	41	21	62
TOTAL	54	46	100

In table 17, more than half of the patients (54.34%) with comorbid diabetes and hypertension had psychiatric illness. Whereas people without comorbid illness had a prevalence of 24.07%.

Table 18

PSYCHIATRIC DIAGNOSIS VS COMORBIDITY

Chi square test

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	17.926[a]	6	.006
Likelihood Ratio	22.563	6	.001
Linear-by-Linear Association	4.063	1	.044
N of Valid Cases	100		

a. 10 cells (71.4%) have expected count less than 5. The minimum expected count is .92.

The association between psychiatric illness and comorbidity is statistically significant, as p value is .006.

Table 19

PSYCHIATRIC DIAGNOSIS VS NUMBER OF EPISODES

PSY DIAG	**NUMBER**		**Total**
	1	2 more	
Depression	12	4	16
Mixed Anxiety Depression	5	0	5
Generalised Anxiety Disorder	6	2	8
Psychosis	2	0	2
Dementia	0	3	3
Others	1	3	4
No Psychopathology	61	1	62
TOTAL	87	13	100

In table 19, patients who had two or more episodes had 92.3% among their group. Patients who had one episode alone, had 29.88% in their group.

Table 20

PSYCHIATRIC DIAGNOSIS VS NUMBER OF EPISODES

Chi square test

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	44.882[a]	6	.000
Likelihood Ratio	35.549	6	.000
Linear-by-Linear Association	5.490	1	.019
N of Valid Cases	100		

a. 10 cells (71.4%) have expected count less than 5. The minimum expected count is .26.

As p value is .000, the association between psychiatric illness and number of episodes is statistically significant.

Table 21

RELATION BETWEEN PSYCHIATRIC ILLNESS WITH PHYSICAL HEALTH

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	247.838[a]	84	.000
Likelihood Ratio	162.216	84	.000
Linear-by-Linear Association	44.078	1	.000
N of Valid Cases	100		

a. 101 cells (96.2%) have expected count less than 5. The minimum expected count is .02.

As p value is .000, the association between psychiatric illness and physical health is statistically significant.

Table 22

RELATION BETWEEN PSYCHIATRIC ILLNESS WITH PSYCHOLOGICAL HEALTH

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	275.902[a]	72	.000
Likelihood Ratio	173.426	72	.000
Linear-by-Linear Association	31.601	1	.000
N of Valid Cases	100		

a. 108 cells (96.4%) have expected count less than 5. The minimum expected count is .02.

As p value is .000, the association between psychiatric illness and psychological health is statistically significant.

Table 23

RELATION BETWEEN PSYCHIATRIC ILLNESS AND SOCIAL RELATIONS

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	157.494[a]	36	.000
Likelihood Ratio	125.521	36	.000
Linear-by-Linear Association	31.750	1	.000
N of Valid Cases	100		

a. 45 cells (91.8%) have expected count less than 5. The minimum expected count is .08.

As p value is .000, the association between psychiatric illness and social relations is statistically significant.

Table 24

RELATION BETWEEN PSYCHIATRIC ILLNESS AND ENVIRONMENTAL FACTORS

	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	241.567[a]	90	.000
Likelihood Ratio	160.964	90	.000
Linear-by-Linear Association	26.018	1	.000
N of Valid Cases	100		

a. 108 cells (96.4%) have expected count less than 5. The minimum expected count is .02.

As p value is .000, the association between psychiatric illness and number of environment is statistically significant.

DISCUSSION

DISCUSSION

In our community, generally the focus in stroke is to alleviate the physical symptoms associated with it. Physician focuses only on the disability like the motor and sensory symptoms, neglecting the emotional disorders associated with it. Psychiatric disorders associated with stroke can either be precipitated by stroke by causing damage to specific regions in brain or by aggravating the pre-existing psychiatric illness. Largely psychiatric disorders are under diagnosed in post stroke patients.

In our study, where 100 people participated, male represented 59% and female represented 41%. In our sample population, total prevalence of psychiatric illness comes to 38%. Among them, the commonest disorder is depression, which come to 18%. Other disorders which follow are generalized anxiety disorder (8%), mixed anxiety disorder (5%), psychosis (2%), dementia (3%) and few others. Others include organic personality disorder and organic emotionally labile disorder which represented 4%. Robinson et al (2006), in his study found that the prevalence for depression is 23%. Tang.W.K et al (2002), in his study found the frequency of depressive disorders, dysthymia, and generalized anxiety disorder as 17.2%, 7.6% and 8.2% respectively. No cases of mania or psychosis were

found. Astrom et al (1993) in his study, identified the prevalence of depression was 25% at the acute stage and decreased to 16% at 12 months and increased to 29% at 3 years.

AGE

In this study, psychiatric illness was noted in increased prevalence in the age group between 50 years to 70 years (76%). In our study, the mean age was 58.13 years. Most studies showed similar results. Ajiboye. P.O, (2013) in his in Nigeria found that the mean age was 60.6 years and range was (60.6± 13.2). Representation of patients beyond 70 years is less, because of mortality associated in that age group. Rinu et al (2009) in her study found that mean age was 54.3 years and concluded that age had a negative correlation with functional independence score.

SEX

In this study, frequency of stroke is 59% in males and 41% in females in the sample. Among them, males contributed 57.89% and females contributed 42.10% to the psychiatric illness. Obiora et al (2006) found 51.1% in males 48.9% in females. Though few studies didn't find any significant association in gender variations. Siobhan et al (1997) in his

study found that the prevalence is more in the male population (52%). Hackett et al (2005) in his review study did not find any association between gender and level of education with post stroke psychiatric morbidity which agrees with our findings.

DOMICILE

People hailing from rural areas accounted for 57% in the sample population and contributed to 64.31% towards psychiatric morbidity. The reason for this increased prevalence can be difficulty in accessing health services.

SOCIOECONOMIC STATUS

In our study, patients who belonged to lower economic status, represented 49% of the sample, but contributed to 65.78% towards psychiatric illness. Socio economic status was calculated based on factors like educational status, employment and income. Due to stroke, patients might have lost his or her livelihood and hence the explanation for the increased prevalence in low socioeconomic status group. Rinu Susan Raju et al (2010) in her study conducted on 162 patients, found rural population of 50.2% in her sample

EDUCATION

Patients who are illiterate or who had completed primary schooling alone (28 patients) had a high representation of 73.68% in their educational level group in psychiatric morbidity. PO Ajiboye et al (2013) in their study found that illiterate and patients who had not completed primary schooling had 54.2% prevalence in their study. Educational level is a significant variable which helps one to gain the knowledge regarding health service and its benefit. There is clear association between psychiatric illness and lesser educational status.

EMPLOYMENT

73.68% of the patients are not employed. This explains the devastating effects, stroke causes in the patients. A number of factors can facilitate or hinder the employer in this role, which include the reasons underlying the employee's decision to return, the relationship between the employer and employee, the functional effects of the stroke in relation to work tasks and the ability and willingness of the employee to work. (Carol Colle et al 2006).

MARITAL STATUS

In our study, majority were married (83%) and 2% were unmarried. Of the 15 patients, who lost their spouses, 10 had psychiatric illness. (66.67%). This may be because of the lack of social support for the patients, which is of much importance for rehabilitation and further periods. Living with spouse is an important variable in the recovery process of stroke.

SIDE OF LESION

In our study, 22 patients (57%) had lesion in the right hemisphere, 14 had lesions in the left hemisphere and two patients had bilateral lesions. The P value in chi-square test is 0.001 which suggests that the association between psychiatric illness and side of lesion is statistically significant. The relationship between psychiatric illness and the side of lesion has been the most controversial area of research. As far as neurological symptoms are concerned, they are pinned down to specific regions. This has rarely been done in psychiatric symptoms.

Depression is found to be common in the left hemispheric lesions. Robinson et al (2003) conducted a meta-analysis of studies in patients, two months after stroke. He observed that depression is more in left anterior hemisphere lesions than left posterior lesions and right hemispheric lesions. He also stated that both major and minor depression are common in left anterior lesions in the acute period after stroke. Bhogal et al (2004) concluded that the association between left hemisphere lesion location and post stroke depression is true in both in-patients and community settings.

In this study, Pooja et al (2013) found significant correlation was found between left sided lesions and post stroke depression. Significance association was also identified with left cortical and left subcortical lesions having direct relationship with depression.

Anxiety disorder is mostly found to be associated with right hemisphere lesions. In our study, out of the eight patients with generalized anxiety disorder, seven had lesions in the right hemisphere. Castillo et al (1993) found that mixed anxiety depression is associated with left cortical lesions and anxiety disorder alone was associated with right hemisphere lesions. Psychosis is found in equal proportions in both side, though the number is too low.

SITE OF LESION

In our study, 28 patients had lesions in either internal capsule or cerebral hemisphere. Details regarding the exact site in the case of cerebrum could not be recorded in few patients, due to unavailability of medical records. The association between psychiatric illness and side of lesion is not statistically significant as p value is .179. Psychiatric illness attributed to specific areas of brain remains an area of controversy, as no conclusive evidence is documented persistently so far.

Many researchers have proposed different brain sites for psychiatric illness. Vataja et al (2001) suggested that the prefrontal subcortical circuits (such as caudate, pallidum and anterior capsule) in the left side are linked to post stroke depression. Robinson et al (1988), in his study of 17 patients with secondary mania, concluded that right hemisphere lesions cause mania. Structures that were identified to be involved were orbitofrontal cortex, basotemporal cortex, subcortical nuclei like caudate or thalamus. Significance of association of mania with right sided lesions higher than the association of depression with let hemisphere lesion.

Robert Robinson et al, in his study found that the depression was significantly increased in patients with left anterior lesions as opposed to other lesion sites. In addition, the severity of depression correlated significantly with proximity of the lesion site to the frontal lobe. Patients with right posterior lesions were more depressed than patients with right anterior lesions.

In cases of psychosis, both patients had cerebral lesions. Only two patients (5.8%) out of the total 28 patients had psychosis. This repeats the findings of Rabins et al (1991). Rabins found a very low prevalence of psychosis in post stroke patients. He also concluded that frontoparietal regions are involved in these cases of secondary mania and they are associated with subcortical atrophy. He also found that these patients also had seizures after stroke and postulated that post stroke seizure is associated with post stroke psychosis. Levine and Finkelstein et al (1982) also reported that seizures usually started after the occurrence of the stroke, but before the onset of psychosis.

TYPE OF LESION

In our study, ischemia represents 71.05% and haemorrhage represents 28.94%. In chi-square test, the association between psychiatric illness and type of lesion is not statistically significant as p value is .073. Almost all disorders are common in ischemic strokes, except for psychosis, which is common in haemorrhagic strokes. Depression is more common in ischemic strokes. Dementia and organic personality disorder is present only in ischemic strokes and this can be attributed to multiple infarcts. Psychosis is presented only in haemorrhagic stroke, and this mostly involve cerebral hemispheres. Rinu Susan Raju et al (2006) found that ischemic stroke represented 77.2% in her study.

DURATION

Regarding the duration, long periods will certainly cause psychopathology. The distress the disability causes may be an answer for the increased prevalence. In our study, as p value is .000, the association between psychiatric illness and duration of illness is statistically significant. As duration of stroke increases, prevalence increases. 16 patients (28.07%) were there in the 2 to 5 years. 17 patients (68%) were there in the 5 to 10 years. 3 patients (100%) were there in the group of

patients who had more than ten years illness. Few patients may remit on their own, some may remit after taking medications.

Robinson et al (2006), in his longitudinal study stated that 19% patients had major depression and 25% had minor depression during onset of stroke. After one year. 50% of patients with major depression remitted, more than 50% with minor depression continued to have either major depression or minor depression. About 30% of patients who didn't have depression earlier, became depressed. Thus, duration of minor depression is variable and in many cases, they turn into chronic depression.

COMORBIDITY

Regarding comorbidity, we have taken only diabetes and hypertension, leaving multiple other vascular causes for the cerebrovascular accidents. More than half of the patients (54.34%) with comorbid diabetes and hypertension had psychiatric illness. Whereas people without comorbid illness had a prevalence of 24.07%. In the chi square test, the P value comes to 0.006, which suggests the association between the psychiatric illness and the co-morbid illnesses considered, is statistically significant. This clearly shows the role played by diabetes and

hypertension in stroke. Rinu et al (2010) in her study found that diabetes (32.7%), hypertension (80.9%), coronary Artery Disease (24.7%), dyslipidemia (14.2%) were commonly associated with stroke.

NUMBER OF EPISODES

Patients who had two or more episodes are vulnerable to get psychiatric illness. This is proved by the study, which shows a 92.3% prevalence. As p value is .000, the association between psychiatric illness and number of episodes is statistically significant. Multiple episode could have caused cumulative effects or would have caused lesions at multiple sites causing greater disability.

QUALITY OF LIFE

In our study, quality of life as assessed based on the interview with the participants is poor. P value is also less than 0.000 which shows the association is statistically significant for psychiatric morbidity and poor quality of life. P value is less than 0.05 for all the four domains. There exists an inverse correlation between them. Rinu et al (2010) stated that the presence of anxiety and depression was negatively correlated with quality

of life in the physical, social, and environmental domains. Functional independence was positively correlated with quality of life in all the domains. Income was positively correlated with social and environmental domains of quality of life.

Elizabeth et al (2008) in her study found that key domains that posed problems in post stroke dementia are social support, coping strategies and mechanisms, communication skills, physical functioning and independent functioning. Another factor that plays a major role is the role to be played by the care-givers. Physical symptoms like fine motor dysfunction, walking difficulty, imbalance, vertigo, speech difficulty and tiredness may impair quality of life. (Berit Ahsilo et al 1985).

Priya Chandran et al (2016) in her study, found that the post-stroke quality of life was low in all domains when compared with normal Indian population. Role limitation and physical domain scores were less in post stroke patients. This finding suggests that many of the post-stroke patients had difficulties with their physical activities and these patients were dependent even for activities of daily living like feeding, dressing, grooming to walking

LIMITATIONS

LIMITATIONS

1. This study is a cross-sectional study and follow-up could not be done.
2. Scales for assessing severity of stroke and to quantify the psychiatric morbidity not used.
3. The study is done in Government Hospital, where most patients come from lower and middle socio-economic status, the results cannot be extrapolated to the general population.

SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

In our study, where 100 patients participated, male represented 59% and the total prevalence was 38%. Among the psychiatric illnesses, depression was found to be the commonest with a prevalence of 18% and the second is generalized anxiety disorder with a prevalence of 8%. Next in order are mixed anxiety disorder 5%, dementia 3% and psychosis 2%.

Age group between 50 years to 70 years were affected the most with 76%. Male gender represented 57.89% of the total psychiatric morbidity. Patients hailing from the rural areas contributed towards 64.31% prevalence. Patients belonging to lower socio-economic status contributed to 65.78%. Patients who had no or little education had a representation of 73.68%. Probably, education has provided an outlet to ventilate their emotional issues and is a protective factor in post stroke patients. In our study, three-fourth of the patients (73.68%) were unemployed which reflects the devastating effects of the stroke. This places a huge economic burden on the patients and the family. Marital status also plays a role in the pathogenesis of psychiatric illness. People who are married and living with their spouses have lesser psychiatric morbidity, explaining that social

support is a necessary factor in the recovery phase of stroke.

Regarding the side of lesion, 57% had right side lesion. Depression is common in the left hemisphere lesions. Anxiety disorder is more common in right hemisphere lesions. There is a lot of controversy surrounding the localization of the side and site of location. 71.05% had ischemic type of lesions. Almost all disorders are common in ischemic strokes, except for psychosis which is common in hemorrhagic strokes. Patients who had long duration of illness and more number of episodes of stroke are prone to get psychiatric illness. Quality of life is poor in all the four domains namely physical health, psychological health, social relationships and environmental domains. Stroke patients may express feelings of hopelessness, helplessness, anxiety and depressed mood and quality of life is reported to decrease in the patients who experience these symptoms.

Disability caused by stroke can cause a massive impact on the patient, with affecting them physically, socially and economically. Stroke survivors are often face the psychiatric illnesses with great challenge. If not treated by pharmacotherapy, psychotherapy and marital therapy,

outcome will be poor. This will invariably lengthen rehabilitation and recovery time. Apart from causing an impact on the survivors themselves, post-stroke psychiatric morbidity also affects family and friends.

To conclude, this study reveals that psychiatric disorders are highly prevalent in patients with stroke, with depression being the most common psychiatric disorders among them. The quality of life is poor in post-stroke patients. Early recognition and treatment of psychiatric illnesses may decrease the economic burden on the patients and their families. Emotional issues which were largely neglected in the post-stroke patients has to be addressed.

Neuropsychiatric manifestations produced by stroke may have negative effects on the social functioning and overall quality of life. It is therefore necessary to focus on the psychiatric morbidity and quality of life in post stroke patients and help them to lead a self-sustained life, by providing treatment and rehabilitation services. Further studies have to be done to know about the longitudinal course of the illness and the characteristics of psychiatric illnesses.

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APPENDICES

APPENDIX I

PROFORMA

Socio-demographic variable:

Name

Age

Sex

Place

Language

Socio-economic status

Education

Occupation

Marital status

Clinical variable:

Side of lesion

Site of lesion

Type of lesion

Duration of illness

Number of episodes

Physical co-morbidity

Substance use history

Past history

INSTRUMENTS

ICD-10

MINI International Neuropsychiatric Interview(MINI)

World Health Organization Quality of Life Inventory (WHO-QOL BREF)

APPENDIX II

MINI INTERNATIONAL NEUROPSYCHIATRIC INTERVIEW:

	MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV	ICD-10	
A	MAJOR DEPRESSIVE EPISODE	Current (2 weeks)	☐	296.20-296.26 Single	F32.x	❐
		Recurrent	☐	296.30-296.36 Recurrent	F33.x	❐
	MDE WITH MELANCHOLIC FEATURES Optional	Current (2 weeks)	☐	296.20-296.26 Single 296.30-296.36 Recurrent	F32.x F33.x	❐ ❐
B	DYSTHYMIA	Current (Past 2 years)	☐	300.4	F34.1	❐
C	SUICIDALITY	Current (Past Month) Risk: ☐ Low ☐ Medium ☐ High	☐			❐
D	MANIC EPISODE	Current Past	☐ ☐	296.00-296.06	F30.x-F31.9	❐
	HYPOMANIC EPISODE	Current Past	☐ ☐	296.80-296.89	F31.8-F31.9/F34.0	❐
E	PANIC DISORDER	Current (Past Month) Lifetime	☐ ☐	300.01/300.21	F40.01-F41.0	❐
F	AGORAPHOBIA	Current	☐	300.22	F40.00	❐
G	SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)	☐	300.23	F40.1	❐
H	OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)	☐	300.3	F42.8	❐
I	POSTTRAUMATIC STRESS DISORDER	Current (Past Month)	☐	309.81	F43.1	❐
J	ALCOHOL DEPENDENCE	Past 12 Months	☐	303.9	F10.2x	❐
	ALCOHOL ABUSE	Past 12 Months	☐	305.00	F10.1	❐
K	SUBSTANCE DEPENDENCE (Non-alcohol)	Past 12 Months	☐	304.00-.90/305.20-.90	F11.1-F19.1	❐
	SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months	☐	304.00-.90/305.20-.90	F11.1-F19.1	❐
L	PSYCHOTIC DISORDERS	Lifetime Current	☐ ☐	295.10-295.90/297.1/ 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29	❐
	MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime Current	☐ ☐	296.24/296.34/296.44 296.24/296.34/296.44	F32.3/F33.3/ ❐ F30.2/F31.2/F31.5 F31.8/F31.9/F39 ❐	
M	ANOREXIA NERVOSA	Current (Past 3 Months)	☐	307.1	F50.0	❐
N	BULIMIA NERVOSA	Current (Past 3 Months)	☐	307.51	F50.2	❐
	ANOREXIA NERVOSA, BINGE EATING/PURGING TYPE	Current	☐	307.1	F50.0	❐
O	GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)	☐	300.02	F41.1	❐
P	ANTISOCIAL PERSONALITY DISORDER Optional	Lifetime	☐	301.7	F60.2	❐

APPENDIX III

WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5

20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

		Equations for computing domain scores	Raw score	Transformed scores*	
				4-20	0-100
27.	**Domain 1**	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	a. =	b:	c:
28.	**Domain 2**	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	a. =	b:	c:
29.	**Domain 3**	Q20 + Q21 + Q22 ☐ + ☐ + ☐	a. =	b:	c:
30.	**Domain 4**	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	a. =	b:	c:

APPENDIX IV

ஆராய்ச்சி ஒப்புதல் கடிதம்

ஆராய்ச்சியின் தலைப்பு: பக்கவாத நோயினால் பாதிக்கப்பட்டவர்களின் வாழ்க்கை தரம் மற்றும் மன நல உடன்நோய்கள் பற்றிய ஆய்வு.

ஆராய்ச்சி செய்பவரின் பெயர்: மரு. வேலிசைக்கோ.பா

மருத்துவ நிலையம்: செங்கல்பட்டு மருத்துவக் கல்லூரி, செங்கல்பட்டு.

.....எனும் நான் எனக்கு கொடுக்கப்பட்ட தகவல் தாளினை படித்து புரிந்து கொண்டேன். நான் 18 வயதை கடந்திருப்பதால் என்னுடைய சுய நினைவுடனும் மற்றும் முழு சுதந்திரத்துடனும் இந்த ஆராய்ச்சியில் என்னைச் சேர்த்துக் கொள்ள சம்மதிக்கிறேன்.

அ) நான் எனக்கு கொடுக்கப்பட்ட தகவல் தாளினை படித்து புரிந்து கொண்டேன்.

ஆ) எனக்கு இந்த ஆராய்ச்சியின் ஒப்புதல் கடிதம் விளக்கப்பட்டது.

இ) எனக்கு இந்த ஆராய்ச்சியின் நோக்கமும், விவரங்களும் விளக்கப்பட்டது.

ஈ) எனக்கு என்னுடைய உரிமைகளைப் பற்றி விளக்கப்பட்டது.

உ) நான் இதுவரை எடுத்துக் கொண்ட அனைத்து மருத்துவ முறைகளைப் பற்றி தெரிவித்திருக்கிறேன்.

ஊ) இந்த ஆராய்ச்சியில் இருந்து நான் எந்நேரமும் பின் வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்து கொண்டேன்.

எ) என்னை பற்றிய எந்த தகவல்களும் அடையாளமும் வெளியிடப்பட மாட்டாது என்பதை நான் புரிந்து கொண்டேன்.

என்னுடைய முழு சுதந்திரத்துடனும் இந்த ஆராய்ச்சியில் என்னைச் சேர்த்துக் கொள்ள சம்மதிக்கிறேன்.

பங்கேற்பாளர் பெயர் மற்றும் கையொப்பம்:
நாள்:
நோயாளியின் உறவினர் பெயர் மற்றும் கையொப்பம்:
நாள்:
சாட்சியாளரின் பெயர் மற்றும் கையொப்பம்: (படிப்பறிவு இல்லாதவர்களுக்கு)
நாள்:
ஆராய்ச்சியாளரின் பெயர் மற்றும் கையொப்பம்:
நாள்:

MASTER CHART

S.NO	AGE	SEX	R/U	SES	EDU	OCCUP	MARITAL	PSY DIAG	DURATIO	SIDE OF L	SITE OF L	TYPE OF L	comorbid	NUMBER	Q physica	Q psychol	Q social	Q environ
1	69	1	1	1	1	1	3	1	3	2	4	1	2	1	21	18	6	29
2	50	2	1	2	1	1	2	7	2	1	4	1	1	1	27	23	11	34
3	60	2	2	1	2	1	2	7	2	1	1	1	1	1	25	22	10	31
4	64	1	2	3	3	2	2	4	3	2	3	2	1	1	19	18	7	23
5	50	2	1	1	1	1	2	7	2	2	6	1	1	1	28	23	12	32
6	52	1	1	2	4	2	2	7	2	2	1	1	1	1	27	22	10	29
7	65	1	2	1	1	2	2	2	2	1	1	1	2	1	23	24	11	32
8	40	1	2	3	4	2	2	7	2	1	6	1	1	1	22	24	10	30
9	42	1	2	2	4	2	2	7	2	1	1	1	2	1	20	22	11	31
10	77	1	1	1	1	1	3	1	3	1	1	1	1	2	17	20	8	27
11	41	2	1	2	2	2	2	7	3	1	1	1	2	1	28	24	12	33
12	75	2	1	3	1	1	3	1	4	2	2	2	1	1	18	17	8	23
13	70	1	1	2	1	1	3	7	1	2	1	1	1	1	22	20	10	30
14	65	1	1	1	2	2	3	1	3	1	1	1	1	1	20	19	10	28
15	64	1	2	2	2	1	2	7	1	1	6	2	2	1	23	21	12	32
16	62	1	2	1	1	1	2	3	2	1	6	2	2	2	21	20	11	29
17	55	1	2	2	2	2	2	7	2	2	1	1	1	1	29	23	12	32
18	50	1	2	3	1	2	2	7	2	2	1	1	2	1	28	22	12	32
19	56	1	2	1	2	2	2	7	2	2	1	1	2	1	27	22	11	23
20	62	2	1	1	1	1	2	2	3	2	1	1	2	1	23	21	10	31
21	68	1	2	2	3	1	2	7	2	1	1	1	1	1	25	23	11	32
22	54	1	2	2	3	2	3	1	3	1	1	1	2	2	21	19	9	26
23	65	2	1	1	1	1	2	7	2	1	6	1	1	1	26	22	11	31
24	47	2	2	1	2	2	2	7	2	1	3	2	1	1	28	24	12	33
25	63	1	2	3	3	2	2	1	1	2	1	1	1	1	21	19	9	25
26	57	1	2	3	1	2	2	7	2	1	5	2	1	1	24	23	11	32
27	53	1	1	1	2	2	2	7	2	2	1	2	2	1	26	22	12	31
28	60	1	1	2	2	2	2	1	2	2	2	1	2	1	23	21	10	27
29	67	2	2	1	1	1	2	7	2	2	3	2	1	1	30	25	11	32
30	53	2	1	1	2	1	2	7	1	1	1	1	1	1	29	23	10	31
31	42	1	2	2	3	2	2	7	2	1	2	2	1	1	29	25	12	33
32	57	2	2	2	1	1	2	3	1	1	1	1	1	1	22	20	9	26
33	62	2	1	1	1	1	2	7	2	2	6	1	2	1	26	23	11	32
34	69	2	2	2	1	1	3	6	3	1	3	1	2	2	18	16	8	21
35	75	1	1	1	1	1	3	5	4	1	1	1	2	2	16	12	6	19
36	64	2	1	1	2	1	2	3	2	2	5	2	1	1	22	21	10	31
37	55	2	1	3	2	2	2	7	1	1	6	1	1	1	26	22	12	29
38	58	1	1	1	2	1	2	1	2	1	3	2	2	1	21	20	10	26
39	61	1	2	3	3	1	2	7	3	2	2	2	2	1	27	24	11	32
40	66	1	1	1	2	1	2	5	3	3	3	1	2	2	18	14	6	19
41	71	2	1	1	2	1	2	6	3	2	1	1	2	1	18	16	6	18
42	63	1	2	2	2	2	1	7	2	2	1	1	2	1	26	23	11	31
43	42	1	2	3	4	2	2	7	1	1	1	1	1	1	27	22	12	32
44	41	2	1	1	2	2	2	7	1	2	1	1	2	1	24	21	12	31
45	76	2	1	1	1	1	2	5	3	1	1	1	2	2	19	16	7	21
46	62	1	1	2	1	1	2	7	2	1	5	2	1	1	25	22	11	32
47	56	1	1	1	1	2	2	7	3	1	5	2	1	1	24	22	12	31
48	52	1	1	2	2	2	2	7	1	2	1	1	1	1	25	21	11	34
49	42	1	2	3	3	2	2	7	1	1	2	2	1	1	23	21	10	33
50	64	2	1	1	2	1	3	7	2	1	2	2	2	1	22	22	11	31

S.NO	AGE	SEX	R/U	SES	EDU	OCCUP	MARIT	PSY DIA	DURAT	SIDE O	SITE OF	TYPE O	comorb	NUMBE	Q phys	Q psyc	Q socia	Q envi
51	55	1	1	2	1	2	2	7	2	1	1	1	1	1	24	21	11	32
52	58	2	2	1	2	2	2	7	2	2	1	1	1	1	25	22	12	34
53	61	2	2	2	3	1	2	1	2	1	3	2	2	1	21	18	9	26
54	71	2	1	1	1	1	3	7	3	2	1	1	2	1	26	22	11	32
55	67	1	1	2	1	1	2	6	3	1	1	1	2	2	18	17	7	19
56	41	2	1	1	2	2	2	7	2	2	1	1	1	1	28	24	12	34
57	50	2	1	1	1	2	2	3	2	1	4	1	1	1	22	20	10	29
58	69	1	2	2	2	1	2	7	3	2	2	2	2	1	28	22	12	35
59	60	2	2	3	3	1	2	7	2	1	1	1	1	1	27	23	12	34
60	54	1	1	1	2	2	2	1	2	2	3	1	2	1	21	20	10	30
61	37	1	2	2	3	2	2	7	1	2	1	1	2	1	27	23	11	33
62	50	2	1	1	1	2	2	7	2	2	6	1	1	1	28	23	12	34
63	52	1	1	1	4	1	2	1	3	2	5	2	2	1	22	19	9	29
64	58	2	1	2	1	2	3	7	2	1	6	1	1	1	28	23	11	34
65	38	1	2	2	4	2	2	7	2	1	1	1	1	1	27	23	11	33
66	52	1	1	1	2	2	2	7	2	1	6	1	1	1	28	21	10	32
67	65	2	1	2	2	1	2	2	2	2	6	1	2	1	22	19	9	27
68	65	2	1	1	1	1	2	1	3	1	3	2	1	2	21	19	9	26
69	58	2	1	2	1	1	2	7	2	1	1	1	1	1	26	23	11	34
70	72	2	1	1	1	1	3	6	3	3	3	1	2	2	18	15	7	19
71	63	1	1	1	2	2	2	7	2	1	1	1	1	1	28	22	11	32
72	53	1	2	1	2	2	2	1	2	2	3	1	1	1	21	18	9	27
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75	59	2	1	1	2	2	2	7	3	1	1	1	1	1	27	23	11	33
76	63	1	1	1	2	2	2	7	2	1	6	1	2	1	28	25	12	33
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79	46	1	2	2	3	2	2	7	1	2	1	1	1	1	27	23	11	34
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81	38	1	2	3	3	2	2	7	2	1	1	1	1	1	28	23	10	31
82	59	1	1	2	2	2	2	7	2	2	1	1	1	1	30	23	12	32
83	67	2	2	3	3	1	2	7	3	1	5	2	1	1	27	22	10	33
84	62	2	2	2	1	1	2	1	3	2	1	1	1	1	22	20	10	20
85	63	1	2	2	2	1	2	3	2	1	3	2	2	1	21	18	8	21
86	66	1	1	2	2	2	2	7	3	1	1	1	2	1	29	23	12	32
87	55	2	1	2	1	1	2	3	2	1	1	1	1	1	23	20	9	29
88	63	2	1	1	1	2	2	2	2	1	1	1	2	1	22	19	9	28
89	57	1	2	2	2	2	2	7	2	2	1	1	1	1	29	25	12	34
90	59	1	1	2	3	2	2	7	1	2	2	2	2	1	28	23	12	33
91	48	1	2	2	2	2	2	7	2	1	1	1	1	1	28	24	11	32
92	52	2	1	1	1	1	2	3	2	1	3	2	2	1	23	20	10	28
93	67	2	1	1	2	1	2	7	2	2	6	1	2	2	28	23	12	34
94	64	1	1	1	2	1	1	1	3	1	1	1	2	2	20	19	9	28
95	59	1	1	1	2	2	2	7	2	1	1	1	1	1	28	24	11	33
96	56	1	1	1	2	2	2	7	1	1	2	2	2	1	29	23	12	32
97	38	1	2	2	4	2	2	7	2	2	1	1	1	1	28	23	11	34
98	70	1	2	2	3	1	3	2	3	1	1	1	2	1	21	19	8	28
99	63	2	1	1	1	1	2	7	2	1	5	2	2	1	28	23	12	31
100	57	1	2	1	2	1	3	1	2	2	1	1	1	1	21	19	9	29

AGE:

Male 1

Female 2

DOMICILE:

Rural 1

Urban 2

SOCIO-ECONOMIC STATUS

Lower 1

Upper lower 2

Lower middle 3

Upper middle 4

Upper 5

EDUCATION :

Illiterare 1

Primary 2

Secondary 3

College 4

OCCUPATION:

Not working 1

Working 2

MARITAL STATUS:

Unmarried 1

Married 2

Widow / widower 3

PSYCHIATRIC DIAGNOSIS

DEPRESSION 1

MIXED ANXIETY DEPRESSION 2

GENERALIZED ANXIETY DISORDER 3

PSYCHOSIS 4

DEMENTIA 5

OTHERS 6

NIL PSYCHIATRY 7

DURATION:

Less than 1 year 1

1 to 5 years 2

5 to 10 years 3

More than 10 years 4

SIDE OF LESION

Right 1

Left 2

Bilateral 3

SITE OF LESION

Internal capsule 1

Basal ganglia 2

Cerebral hemisphere 3

Corona radiata 4

Thalamus 5

Lacunar infarcts 6

Others 7

TYPE OF LESION

Ischemic 1

Haemorrhagic 2

COMORBIDITY

Absence 1

Presence 2

NUMBER OF EPISODES

One episode 1

More than one episode 2

QUALITY OF LIFE:

1. Physical health:

   Activities of daily living.

   Dependence on medicinal substances and medical aids.

   Energy and fatigue

   Mobility

   Pain and discomfort

   Sleep and rest

   Work Capacity

2. Psychological

   Bodily image and appearance

Negative feelings

Positive feelings

Self-esteem

Spirituality / Religion / Personal beliefs

Thinking, learning, memory and concentration

3. Social relationships

Personal relationships

Social support

Sexual activity

4. Environment

Financial resources

Freedom, physical safety and security

Health and social care: accessibility and quality

Home environment

Opportunities for acquiring new information and skills

Participation in and opportunities for recreation / leisure activities

Physical environment (pollution / noise / traffic / climate)

Transport