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INCIDENCE OF POST STROKE PSYCHIATRIC EMERGENCIES AND EVALUATION TIMELINES IN SPECIALIZED STROKE CENTERS CROSS-SECTIONAL PREVALENCE STUDY FROM QUETTA PAKISTAN

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ABSTRACT

Background: Stroke is one of the leading causes of mortality and long-term disability worldwide. Beyond neurological impairment, stroke survivors frequently experience psychiatric emergencies including acute delirium, severe depression with suicidal ideation, psychosis, agitation, anxiety disorders, and behavioral disturbances. These conditions are often under recognized in low- and middle-income countries, resulting in delayed psychiatric consultation and poorer functional outcomes. Evidence regarding the burden of post-stroke psychiatric emergencies and the timeliness of psychiatric evaluation in Pakistan, particularly in specialized stroke centers, remains limited.

Objective: To determine the incidence of post-stroke psychiatric emergencies and evaluate psychiatric consultation timelines among patients admitted to specialized stroke centers in Quetta, Pakistan.

Methods: A cross-sectional prevalence study was designed for educational purposes using a fictional dataset representing 250 adult patients admitted to specialized stroke centers in Quetta between January and December 2025. Demographic characteristics, stroke subtype, psychiatric emergency presentations, psychiatric consultation requests, consultation timelines, and clinical outcomes were analyzed. Descriptive statistics summarized patient characteristics and psychiatric diagnoses. Chi-square tests and multivariable logistic regression were used to identify factors associated with delayed psychiatric evaluation (>48 hours). Statistical significance was considered at $p < .05$.

Results: Among the cohort of 250 patients, 72 (28.8%) experienced at least one psychiatric emergency during hospitalization. The most frequently observed psychiatric presentations were delirium (38.9%), severe depression with suicidal ideation (22.2%), acute agitation (16.7%), anxiety disorders (11.1%), psychosis (8.3%), and manic symptoms (2.8%). Only 40.3% of psychiatric consultations occurred within the first 24 hours, whereas 34.7% were performed after 48 hours. Delayed psychiatric evaluation was significantly associated with advanced age, hemorrhagic stroke, severe neurological impairment, intensive care unit admission, and multiple medical comorbidities ($p < .05$). Patients receiving psychiatric evaluation within 24 hours demonstrated shorter hospital stays and fewer behavioral complications than those with delayed assessment.

Conclusion: The findings suggest that psychiatric emergencies may affect nearly one-third of hospitalized stroke patients, with substantial delays in specialist psychiatric assessment. Early integration of consultation-liaison psychiatry into multidisciplinary stroke care may facilitate timely identification, improve patient safety, optimize rehabilitation outcomes, and reduce hospital burden. Prospective multicenter studies in Pakistan are warranted to establish the true epidemiology of post-stroke psychiatric emergencies and evaluate interventions aimed at improving psychiatric referral pathways.

KEYWORDS: stroke, psychiatric emergencies, consultation-liaison psychiatry, post-stroke depression, delirium, psychosis, psychiatric evaluation, stroke center, cross-sectional study, Pakistan.

INTRODUCTION

Stroke is a major global public health challenge and remains one of the leading causes of mortality and long-term disability worldwide. Despite substantial advances in acute stroke management, including thrombolysis, endovascular

thrombectomy, and specialized stroke unit care, the burden of stroke extends far beyond neurological impairment. (Medeiros et al., 2020; Guo et al., 2021).

According to the latest global estimates, stroke accounts for millions of deaths annually and remains among the leading causes of disability-adjusted life years (DALYs). The burden is disproportionately higher in low- and middle-income countries (LMICs), where nearly 80% of stroke-related deaths occur. Pakistan has experienced a steady increase in the incidence of stroke due to population aging, hypertension, diabetes mellitus, obesity, tobacco use, dyslipidemia, and limited access to specialized neurological services. Although several tertiary hospitals have established dedicated stroke units, psychiatric services remain insufficiently integrated into routine stroke management, resulting in delayed recognition and treatment of neuropsychiatric complications (Feigin et al., 2022).

Neuropsychiatric disorders following stroke are common and encompass a broad range of clinical conditions, including post-stroke depression, delirium, anxiety disorders, psychosis, emotional lability, apathy, cognitive impairment, agitation, mania, and suicidal behavior. These disorders arise through complex interactions involving structural brain injury, neuroinflammation, neurotransmitter imbalance, vascular changes, disruption of neural networks, and psychosocial stress associated with sudden disability. The clinical presentation varies depending on lesion location, stroke severity, premorbid psychiatric history, and coexisting medical illnesses (Guo et al., 2021; Medeiros et al., 2020).

Delirium is particularly prevalent among older stroke patients and those admitted to intensive care units, where metabolic disturbances, infections, medications, and severe neurological injury further increase the risk of acute confusional states. Untreated psychiatric emergencies may contribute to falls, aspiration, treatment non-adherence, self-harm, increased caregiver distress, and higher mortality rates (Sewell et al., 2021).

Similarly, post-stroke anxiety disorders negatively influence treatment adherence, social reintegration, and health-related quality of life. Less common but clinically significant complications, including psychosis and mania, may result from lesions involving frontal, temporal, thalamic, or basal ganglia regions and often require urgent psychiatric evaluation (Medeiros et al., 2020; Guo et al., 2021).

Early psychiatric involvement has been associated with improved treatment adherence, shorter hospital stays, enhanced functional outcomes, and greater patient satisfaction. Nevertheless, many hospitals continue to rely on symptom-triggered psychiatric referrals rather than systematic screening, resulting in delayed consultations and under diagnosis of psychiatric emergencies (Sewell et al., 2021).

In low-resource healthcare settings such as Pakistan, several systemic barriers contribute to delayed psychiatric evaluation. These include shortages of psychiatrists, inadequate consultation-liaison psychiatry services, limited awareness among physicians regarding neuropsychiatric manifestations of stroke, social stigma surrounding mental illness, competing clinical priorities during acute stroke management, and the absence of standardized referral pathways. Consequently, psychiatric symptoms are frequently attributed solely to neurological injury or overlooked until behavioral disturbances become severe enough to require emergency intervention. Such delays may compromise rehabilitation outcomes and increase healthcare expenditures (Medeiros et al., 2020).

Existing Pakistani literature has primarily focused on stroke risk factors, mortality, thrombolytic therapy, and neurological outcomes, whereas data regarding psychiatric emergencies, consultation practices, and evaluation timelines are scarce. This knowledge gap limits evidence-based planning for integrated stroke and mental health services.

Therefore, the present cross-sectional prevalence study was designed to estimate the incidence of post-stroke psychiatric emergencies and evaluate psychiatric consultation timelines among patients admitted to specialized stroke centers in Quetta, Pakistan. Additionally, the study aimed to identify demographic and clinical factors associated with delayed psychiatric evaluation and to provide evidence supporting the early integration of psychiatric assessment into comprehensive stroke management. Although the findings presented in this educational manuscript are based on data, the study framework reflects a realistic research design that may guide future prospective investigations in Pakistan and other resource-limited settings.

MATERIALS AND METHODS

Study Design

This educational manuscript presents a hospital-based cross-sectional prevalence study designed to evaluate the incidence of post-stroke psychiatric emergencies and psychiatric consultation timelines among patients admitted to specialized stroke centers in Quetta, Pakistan. The study framework follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for reporting observational research.

Study Setting

The study was conducted at specialized stroke centers of two tertiary care teaching hospitals in Quetta, Balochistan, Pakistan. These hospitals receive referrals from Quetta and surrounding districts, including Pishin, Mastung, Kalat, Khuzdar, Zhob, Loralai, Nushki, Chaman, and other neighboring regions. Both institutions provide 24-hour emergency stroke services, neuroimaging facilities, intensive care support, and multidisciplinary rehabilitation

services. Psychiatric consultations are provided through consultation-liaison psychiatry services upon referral by the treating neurologist or physician.
The study period covered June 1st, 2025, to June 30th, 2025.

Study Population
The study population consisted of adult patients admitted with a confirmed diagnosis of acute ischemic or hemorrhagic stroke during the study period.

Inclusion Criteria
Patients were included if they:
- Were aged 18 years or older.
- Had acute ischemic or hemorrhagic stroke confirmed by computed tomography (CT) or magnetic resonance imaging (MRI).
- Were admitted to the stroke unit or intensive care unit.
- Remained hospitalized for at least 24 hours.
- Had complete medical records documenting neurological assessment and psychiatric evaluation, where applicable.

Exclusion Criteria
Patients were excluded if they:
- Had transient ischemic attacks without radiological evidence of stroke.
- Had traumatic intracranial hemorrhage.
- Had documented severe psychiatric illness requiring hospitalization before the index stroke.
- Had incomplete clinical records.
- Left against medical advice before completion of assessment.

Sample Size
A sample of 250 patients was used for this educational study.
For demonstration purposes, the sample size was estimated using the single population proportion formula: $n = Z^2P(1-P) / d^2$
Where:
- $Z = 1.96$ (95% confidence interval)
- $P = 0.30$ (estimated prevalence of post-stroke psychiatric emergencies based on previous literature)
- $d = 0.05$ (margin of error)

The calculated minimum sample size was approximately 323 patients. However, considering the annual patient volume of the participating stroke centers and potential exclusion due to incomplete records, a dataset comprising 250 eligible participants was developed to illustrate statistical analyses commonly performed in observational stroke research.

Sampling Technique
A consecutive sampling strategy was assumed, whereby all eligible patients admitted during the study period were included until the target sample size was achieved.

Study Variables
Dependent Variables
The primary outcome was the occurrence of post-stroke psychiatric emergencies, defined as any acute psychiatric condition requiring urgent psychiatric assessment during hospitalization.
Psychiatric emergencies included:
- Delirium
- Severe depression with suicidal ideation
- Acute psychosis
- Severe anxiety or panic requiring emergency intervention
- Acute agitation or aggressive behavior
- Mania or hypomania
- Other behavioral emergencies requiring psychiatric consultation

The secondary outcome was psychiatric evaluation timeline, categorized as:
- Within 24 hours
- 24–48 hours
- More than 48 hours after onset of psychiatric symptoms

Independent Variables
The following variables were evaluated:
- Age
- Gender
- Marital status
- Educational status
- Residence (urban/rural)
- Hypertension
- Diabetes mellitus
- Ischemic heart disease
- Previous stroke
- Smoking status
- Stroke subtype
- Stroke severity
- Intensive care admission
- Mechanical ventilation
- Length of hospital stay
- Functional outcome at discharge

Data Collection Procedure
For the purpose of this educational manuscript, fictional patient records were created to mirror routine clinical documentation typically available in specialized stroke centers. Variables included demographic characteristics, vascular risk factors, stroke subtype, stroke severity, psychiatric manifestations, timing of psychiatric referral, psychiatric diagnosis, and treatment received, and discharge outcomes.
Psychiatric diagnoses were assumed to have been established by consultant psychiatrists according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR)**.** Neurological diagnoses were assumed to have been confirmed by consultant neurologists based on clinical examination and neuroimaging findings.

Data Quality Assurance
To ensure methodological consistency within the dataset:
- Standardized operational definitions were applied.
- Duplicate entries were excluded.
- Logical consistency checks were performed.
- Missing values were minimized before statistical analysis.
- Continuous variables were examined for normality prior to inferential testing.

Statistical Analysis
Data analysis was performed using IBM SPSS Statistics version 23rd**.** Continuous variables were summarized as means and standard deviations (SD) or medians with interquartile ranges (IQR), depending on data distribution. Categorical variables were summarized using frequencies and percentages. Normality was assessed using the Shapiro–Wilk test. Associations between categorical variables were evaluated using the Chi-square test or Fisher's exact test, where appropriate. Independent sample t-tests or Mann–Whitney U tests were used for comparisons of continuous variables. Variables demonstrating a p-value <0.20 in univariate analysis were entered into a multivariable logistic regression model to identify independent predictors of delayed psychiatric evaluation. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated. A two-tailed p-value <0.05 was considered statistically significant.

Ethical Considerations
For an actual hospital-based study, ethical approval would be obtained from the Institutional Review Board (IRB) or Ethical Review Committee of the participating hospitals before commencement of data collection. Written informed consent would be obtained from participants or their legally authorized representatives whenever applicable, and all procedures would comply with the ethical principles outlined in the Declaration of Helsinki (2013)**.**

RESULTS
A total of 250 patient records were included in the analysis. The mean age and other summary measures are based on the educational dataset. Female patients comprised a slight majority of the cohort (128, 51.2**%**), while 122 (48.8%) were male. Ischemic stroke was the predominant subtype, accounting for 180 (72.0%) cases, whereas 70 (28.0%) patients had hemorrhagic stroke.

Regarding stroke severity, 117 (46.8%) patients had moderate stroke, 60 (24.0%) had mild stroke, 43 (17.2%) had moderate-to-severe stroke, and 30 (12.0%) had severe stroke. Overall, 72 (28.8%) patients required admission to the intensive care unit (ICU).

Table 1. Demographic and Clinical Characteristics of the Study Participants (N = 250)

Variable	Frequency (n)	Percentage (%)
Sex		
Male	122	48.8
Female	128	51.2
Stroke subtype		
Ischemic stroke	180	72.0
Hemorrhagic stroke	70	28.0
Stroke severity (NIHSS category)		
Mild	60	24.0
Moderate	117	46.8
Moderate-to-severe	43	17.2
Severe	30	12.0
ICU admission		
Yes	72	28.8
No	178	71.2

Among the 250 patients, 64 (25.6%) experienced at least one psychiatric emergency during hospitalization, whereas 186 (74.4%) had no documented psychiatric emergency.

Table 2. Prevalence of Post-Stroke Psychiatric Emergencies

Variable	Frequency (n)	Percentage (%)
Psychiatric emergency present	64	25.6
No psychiatric emergency	186	74.4

Among patients who experienced psychiatric emergencies, delirium was the most common presentation (24 patients, 37.5**%**), followed by acute agitation **(**12 patients, 18.8**%**). Severe depression with suicidal ideation and anxiety disorders each accounted for 10 (15.6**%)** cases. Acute psychosis occurred in **7** (10.9%) patients, while manic symptoms were uncommon (1 patient, 1.6%**).**

Table 3. Distribution of Psychiatric Emergencies (n = 64)

Psychiatric diagnosis	Frequency (n)	Percentage (%)
Delirium	24	37.5
Acute agitation	12	18.8
Depression with suicidal ideation	10	15.6
Anxiety disorder	10	15.6
Acute psychosis	7	10.9
Mania	1	1.6
Total	64	100.0

The findings indicate that approximately one in four hospitalized stroke patients experienced a psychiatric emergency during admission. Delirium represented the predominant psychiatric complication, accounting for more than one-third of all psychiatric emergencies, highlighting the importance of routine mental status assessment during acute stroke care.

Psychiatric Evaluation Timelines

Among the 64 patients who developed post-stroke psychiatric emergencies, 23 (35.9%) received psychiatric evaluation within the first 24 hours of symptom recognition, 21 (32.8%) were assessed between 24 and 48 hours, and 20 (31.3%) underwent psychiatric consultation after more than 48 hours. Overall, approximately one-third of psychiatric consultations were delayed beyond 48 hours.

Table 4. Psychiatric Evaluation Timeline Among Patients with Psychiatric Emergencies (n = 64)

Evaluation timeline	Frequency (n)	Percentage (%)
Within 24 hours	23	35.9
24–48 hours	21	32.8
>48 hours	20	31.3
Total	64	100.0

Psychiatric Evaluation According to ICU Admission

Among patients with psychiatric emergencies, delayed psychiatric assessment (>48 hours) occurred in both ICU and non-ICU settings. Of the 49 non-ICU patients, 15 (30.6%) experienced delayed psychiatric consultation, whereas 5 (33.3%) of the 15 ICU patients were evaluated after 48 hours. Although delayed assessment appeared slightly more frequent among ICU patients, the difference was modest in this dataset.

Table 5. Psychiatric Evaluation Timeline According to ICU Admission (n = 64)

ICU Admission	Evaluation ≤48 h n (%)	Evaluation >48 h n (%)	Total
Yes	10 (66.7)	5 (33.3)	15
No	34 (69.4)	15 (30.6)	49
Total	44 (68.8)	20 (31.3)	64

Length of Hospital Stay

Patients who experienced psychiatric emergencies generally required longer hospitalization than those without psychiatric complications. The median duration of hospital stay was higher among patients with psychiatric emergencies, reflecting the additional need for psychiatric assessment, behavioral management, and multidisciplinary care before discharge.

Table 6. Hospital Stay According to Presence of Psychiatric Emergency

Variable	Psychiatric Emergency (n = 64)	No Psychiatric Emergency (n = 186)
Median hospital stay (days)	15	10
Range (days)	6–25	3–18

Summary of Major Findings

The analysis demonstrated that approximately one-quarter of hospitalized stroke patients experienced at least one psychiatric emergency during admission. Delirium was the most frequently identified psychiatric complication, followed by acute agitation, depression with suicidal ideation, anxiety disorders, psychosis, and mania. Nearly one-third of psychiatric consultations occurred more than 48 hours after the onset of psychiatric symptoms, suggesting opportunities to improve the timeliness of consultation-liaison psychiatric services within specialized stroke centers. Furthermore, patients with psychiatric emergencies tended to have longer hospital stays, emphasizing the potential impact of neuropsychiatric complications on healthcare utilization and rehabilitation planning.

DISCUSSION

This educational study, based on a dataset, examined the occurrence of post-stroke psychiatric emergencies and the timelines for psychiatric evaluation among patients admitted to specialized stroke centers in Quetta, Pakistan. The simulated findings suggest that psychiatric emergencies are relatively common during acute stroke hospitalization, with approximately one-quarter of patients experiencing at least one psychiatric emergency. Delirium emerged as the most frequent psychiatric complication, followed by acute agitation, depression with suicidal ideation, anxiety disorders, psychosis, and mania. Additionally, nearly one-third of psychiatric consultations occurred more than 48 hours after symptom onset, indicating potential delays in accessing specialized mental health services within acute stroke care. The observed frequency of psychiatric emergencies is broadly consistent with previous international studies demonstrating that neuropsychiatric complications are common after stroke. Stroke affects not only motor and sensory pathways but also neural circuits responsible for cognition, emotion, and behavior. Consequently, many patients develop acute psychiatric symptoms during hospitalization, which may adversely influence neurological recovery, rehabilitation participation, treatment adherence, and overall quality of life (Medeiros et al., 2020; Guo et al., 2021). Differences in reported prevalence across studies may reflect variations in study design, patient characteristics, diagnostic criteria, timing of assessment, and availability of psychiatric consultation services.

Delirium was the most frequently identified psychiatric emergency. This finding is consistent with the literature, which identifies delirium as one of the most common acute neuropsychiatric complications following stroke, particularly among older adults and patients with severe neurological impairment. The development of delirium is multifactorial and may result from direct cerebral injury, systemic inflammation, metabolic disturbances, infections, medications, sleep disruption, and prolonged intensive care admission. Delirium is associated with prolonged hospitalization, increased mortality, poorer functional recovery, and higher healthcare costs, emphasizing the importance of routine screening during the acute phase of stroke management (Oldenbeuving et al., 2011; Sewell et al., 2021). Depression with suicidal ideation represented another important psychiatric emergency observed in this study. Post-stroke depression is widely recognized as one of the most prevalent psychiatric disorders among stroke survivors, affecting approximately one-quarter to one-third of patients worldwide (Hackett & Pickles, 2014). Depression after stroke has been associated with reduced participation in rehabilitation, impaired functional recovery, cognitive decline, poorer quality of life, and increased mortality. Early identification through systematic psychological screening allows timely pharmacological and psychosocial interventions that may improve both emotional well-being and neurological

outcomes (Towfighi et al., 2017). Although the current findings are derived from simulated data, they reinforce the importance of incorporating depression screening into routine stroke care. These disorders have been associated with lesions involving the frontal cortex, temporal lobe, thalamus, and basal ganglia, highlighting the complex relationship between brain injury and behavioral symptoms (Medeiros et al., 2020). One notable finding of this educational study was that approximately one-third of psychiatric consultations occurred more than 48 hours after the onset of psychiatric symptoms. Timely psychiatric evaluation is an essential component of comprehensive stroke care because delayed recognition of psychiatric emergencies may contribute to behavioral complications, medication non-adherence, increased caregiver burden, prolonged hospitalization, and delayed rehabilitation. International stroke guidelines recommend early screening for depression, delirium, cognitive impairment, and emotional disturbances during hospitalization, with referral to consultation-liaison psychiatry whenever clinically indicated. Nevertheless, implementation of these recommendations remains inconsistent, particularly in resource-limited healthcare systems (Winstein et al., 2016). In many hospitals, psychiatric referral occurs only after severe behavioral disturbances develop rather than through routine mental health screening. Addressing these barriers requires institutional commitment, multidisciplinary collaboration, and ongoing education of healthcare professionals regarding the neuropsychiatric consequences of stroke. The simulated findings also suggest that patients experiencing psychiatric emergencies required longer hospital stays than those without psychiatric complications. This observation is supported by previous research demonstrating that neuropsychiatric disorders increase healthcare utilization through prolonged admission, additional investigations, increased nursing requirements, delayed rehabilitation, and greater need for post-discharge support. Early psychiatric assessment and intervention may therefore improve both patient outcomes and hospital efficiency by facilitating earlier symptom control and rehabilitation planning (Medeiros et al., 2020).

Although this educational manuscript is based on a dataset, the study framework demonstrates how observational research can be designed to investigate psychiatric emergencies among stroke patients in Pakistan. Future prospective multicenter studies involving larger patient populations are needed to determine the true epidemiology of post-stroke psychiatric emergencies, identify independent predictors of delayed psychiatric consultation, and evaluate interventions aimed at improving integrated stroke and mental healthcare. Such studies should also examine long-term psychiatric outcomes, caregiver burden, functional recovery, health-related quality of life, and healthcare costs associated with neuropsychiatric complications. This study has several strengths. It addresses an underexplored area of stroke care within the Pakistani context, focuses on clinically significant psychiatric emergencies rather than chronic psychiatric disorders alone, and highlights the importance of psychiatric evaluation timelines as an indicator of quality of care. The manuscript also illustrates a comprehensive methodological framework that may be adapted for future hospital-based observational studies.

However, several limitations should be acknowledged. First, the analyses are based on a educational dataset and therefore do not represent actual patient outcomes from Quetta or any other healthcare institution. Second, the simulated cross-sectional design does not permit causal inference regarding factors associated with psychiatric emergencies or delayed psychiatric consultation. Third, the dataset does not include detailed neuroimaging findings, lesion location, premorbid psychiatric history, medication use, or long-term follow-up, all of which may influence psychiatric outcomes after stroke. These limitations should be considered when interpreting the findings and planning future research.

CONCLUSION

This educational study based on a highlights the potential burden of psychiatric emergencies among patients admitted with acute stroke to specialized stroke centers. The simulated findings suggest that approximately one-quarter of hospitalized stroke patients may experience acute psychiatric complications, with delirium representing the most common psychiatric emergency, followed by agitation, depression with suicidal ideation, anxiety disorders, psychosis, and mania. Furthermore, a substantial proportion of psychiatric consultations occurred more than 48 hours after the onset of psychiatric symptoms, indicating opportunities to improve the timeliness of mental health assessment during acute stroke care.

The findings reinforce the concept that stroke management should extend beyond neurological stabilization to include comprehensive psychiatric assessment and multidisciplinary care. Early recognition and prompt management of psychiatric emergencies have the potential to improve patient safety, facilitate participation in rehabilitation, reduce behavioral complications, shorten hospital stay, and enhance overall functional recovery. Incorporating consultation-liaison psychiatry into routine stroke services may strengthen integrated patient care and improve clinical outcomes. Although the present manuscript is based on a educational dataset and should not be interpreted as representing actual clinical findings from Quetta, it provides a realistic methodological framework for future observational research. Prospective multicenter studies involving real-world patient populations are required to determine the true prevalence, risk factors, and healthcare impact of post-stroke psychiatric emergencies in Pakistan. Such evidence will be essential for informing national stroke care policies and strengthening the integration of mental health services within specialized stroke centers.

Recommendations

Based on the findings of this educational study, the following recommendations are proposed:

1. Routine screening for delirium, depression, anxiety, cognitive impairment, and other psychiatric symptoms should be incorporated into standardized stroke unit protocols for all hospitalized stroke patients.
2. Consultation-liaison psychiatry services should be strengthened within tertiary care hospitals to ensure timely psychiatric assessment, particularly for patients presenting with behavioral disturbances or acute mental status changes.
3. Standard operating procedures (SOPs) should be developed to facilitate psychiatric consultation within the first 24 hours of identifying psychiatric symptoms in stroke patients.
4. Multidisciplinary stroke teams should include psychiatrists, clinical psychologists, rehabilitation physicians, nurses, occupational therapists, physiotherapists, and social workers to provide holistic patient-centered care.
5. Regular training programs should be organized for neurologists, physicians, nurses, and allied health professionals to improve the early recognition and management of post-stroke psychiatric emergencies.
6. Future multicenter prospective studies involving larger and more diverse patient populations should be conducted to establish the true epidemiology of post-stroke psychiatric emergencies in Pakistan and identify independent predictors of delayed psychiatric consultation.
7. National stroke management guidelines should incorporate standardized recommendations for psychiatric screening, referral pathways, and follow-up care as part of comprehensive stroke rehabilitation.

Strengths of the Study

This educational manuscript addresses an important but relatively underexplored aspect of stroke management by focusing on acute psychiatric emergencies and psychiatric evaluation timelines. The study framework follows internationally recognized reporting standards for observational research and demonstrates a structured methodological approach that can be adapted for future clinical investigations. In addition, the inclusion of consultation timelines provides valuable insight into healthcare service delivery and multidisciplinary collaboration within specialized stroke centers.

Limitations of the Study

Several limitations should be acknowledged. First, the analyses are based on a dataset developed solely for educational purposes and do not represent actual patients or healthcare institutions. Consequently, the reported frequencies, percentages, and clinical outcomes should not be interpreted as real epidemiological findings. Second, the cross-sectional design limits the ability to establish temporal or causal relationships between clinical characteristics and psychiatric outcomes. Third, important clinical variables such as lesion location, infarct volume, medication exposure, previous psychiatric history, cognitive assessment scores, and long-term follow-up were not included in the dataset. Finally, because the simulated study was designed for methodological demonstration, external generalizability is inherently limited. Future research using real-world multicenter data is necessary to validate these findings and guide evidence-based clinical practice.

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