Psychiatric Morbidities After Stroke in Asia: A Systematic Review

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ABSTRACT

Background Stroke is currently the second leading cause of death worldwide and is one of the leading causes of long-term disability. Mood disorders are prevalent after a stroke and may hinder physical, functional, and cognitive recovery; hence, it is undeniably necessary to recognize them early. Stroke mortality is generally higher in Asia as most of the countries therein are in economic transition. Socioeconomic status is a major contributor to stroke burden as greater odds of disability are found in patients with lower educational status and income.

Objectives The primary objective of this study is to identify the psychiatric morbidities commonly seen after a stroke in Asia.

Search Methods The following databases were utilized for extensive literature search: PubMed (January 2002 to June 2022), Cochrane Library (January 2002 to June 2022), and EBSCO (January 2002 to June 2022). The search made use of keyword combinations, Boolean operators "AND" and "OR," truncations, and field tags last October 2022.

Selection Criteria Articles on the prevalence and cross-sectional studies were included if they involved stroke survivors who developed post-stroke psychiatric morbidities in Asia. Additional inclusion criteria consisted of studies that have to be written in the English language and having free full texts available.

Data Collection and Analysis This systematic review made use of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards and guidelines. The JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data was used in the assessment for the quality of articles to be included in this systematic review.

Results and Conclusion Affective disorders and generalized anxiety disorder were the common psychiatric morbidities identified post-stroke. The Hospital Anxiety and Depression Scale (HADS) may be used to diagnose post-stroke depression and anxiety. Males in their middle to late adulthood with higher National Institutes of Health Stroke Scale (NIHSS) scores and poor stroke outcomes (higher scores in the Modified Rankin Scale) were associated with a higher likelihood of developing the aforementioned psychiatric morbidities.

Keywords post-stroke, depression, anxiety, mania, psychosis, Asia

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INTRODUCTION

Stroke is currently the second leading cause of death worldwide and is one of the leading causes of long-term disability.[1] In the Philippines alone, it has a prevalence of 0.9%.[2] This is attributed to the shift from communicable diseases, maternal and nutritional causes to noncommunicable diseases due to the increase and aging of the world's population and decreased death rates in recent years as stated

in the Global Burden of Disease, Injuries, and Risk Factors Study (GBD 2015).[1] This emphasizes that although there is a positive trend in survival post-stroke, it also means that there are more individuals who will have to live with the consequences of the disease such as disabilities that affect their quality of life. A significant proportion of the aforementioned disability is attributed to the individuals' reduced mobility due to hemiparesis, but aphasia and depression have likewise been identified as contributors to the overall burden.[1]

Mood disorders are prevalent after stroke and may hinder physical, functional and cognitive recovery; hence it is undeniably necessary to recognize them early.[3] Post-stroke depression, seen under the scope of Depressive Disorder due to Another Medical Condition in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM V-TR), is the most common psychiatric problem encountered in stroke survivors and is seen in one-third of the cases with a cumulative incidence of 55%.[4-6]

Sixty percent of the world's population is found in Asia and most of the countries therein are in economic transition.[1,7] Socioeconomic status is a major contributor to stroke burden as greater odds of disability are found in patients with lower educational status and income.[1] Due to disparities in healthcare provision, a tremendous challenge is posed to the control of disease in this part of the world.[7] The Philippine data demonstrated this tremendous burden as health care being *largely private and the cost borne out-of-pocket by patients and their families*.[2] The delivery of adequate support to rural communities and underprivileged sectors poses additional hurdles.[2] It is of note that stroke mortality is generally higher in this continent when compared to Western Europe, the Americas or Australasia.[7]

OBJECTIVES

Post-stroke depression is the most common psychiatric problem encountered in stroke survivors; however, it is not the only psychiatric morbidity that exists in this population. As previously mentioned, it is impeccable to identify these conditions because they increase the individual's risk for suboptimal recovery in view of the fact that it affects their ability to engage in rehabilitation therapies. This study aims to identify the psychiatric morbidities frequently recognized after stroke in Asia. This document will review the existing literature on this topic with the goal of increasing awareness and subsequent screening for earlier identification and intervention in this subgroup of survivors.

METHODOLOGY

Study Design

This systematic review made use of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards and guidelines.

Search Strategy

The following databases were utilized for extensive literature search: PubMed (January 2002 to June 2022), Cochrane Library (January 2002 to June 2022), and EBSCO (January 2002 to June 2022). The search made use of keyword combinations, Boolean operators "AND" and "OR," truncations, and field tags last October 2022. A comprehensive search strategy was utilized: prevalence and post-stroke, and depression and (anxiety or mania or psychosis), and Asia. The search strategy was adapted for each database in order to achieve more sensitivity. The references of relevant publications found by the search were screened for further studies.

The articles included were based on predefined criteria. Cross-sectional studies that discussed stroke survivors who developed post-stroke psychiatric morbidities such as depression, anxiety, mania and psychosis were reviewed. Additional inclusion criteria consisted of studies that have to be written in the English language and having free full texts available. In addition, the geographical area, particularly Asia, had to be reported. Finally, the demographics of patients should be described. The population of interest was post-stroke patients, male and female, aged more than 18 years old.

Quality Assessment

The JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data was used in the assessment for the quality of the articles to be included in this systematic review. This questionnaire consisted of nine questions answerable by yes, no, unclear or not/applicable. The diagram below shows the aforementioned document. Based on the criteria listed, the quality score for the prevalence study is given.

JBI CRITICAL APPRAISAL CHECKLIST FOR STUDIES REPORTING PREVALENCE DATA

Reviewer_____Date_____

Author_____ Year_____ Record Number_____

		Yes	No	Unclear	Not applicable
1.	Was the sample frame appropriate to address the target population?	☐	☐	☐	☐
2.	Were study participants sampled in an appropriate way?	☐	☐	☐	☐
3.	Was the sample size adequate?	☐	☐	☐	☐
4.	Were the study subjects and the setting described in detail?	☐	☐	☐	☐
5.	Was the data analysis conducted with sufficient coverage of the identified sample?	☐	☐	☐	☐
6.	Were valid methods used for the identification of the condition?	☐	☐	☐	☐
7.	Was the condition measured in a standard, reliable way for all participants?	☐	☐	☐	☐
8.	Was there appropriate statistical analysis?	☐	☐	☐	☐
9.	Was the response rate adequate, and if not, was the low response rate managed appropriately?	☐	☐	☐	☐

Overall appraisal: Include   ☐   Exclude   ☐   Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

Criteria and corresponding scores

Author										Total	%
	#1	#2	#3	#4	#5	#6	#7	#8	#9		

Figure 1 JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

Data Extraction

Two independent researchers were used in the extraction of data presented in this article. A pre-designed Excel worksheet was utilized in the gathering of applicable data. The following information was extracted from the documents selected: authors, year of publication and demographics. The authors also drew out the conditions identified, scales utilized, risk factors, results and conclusions made. Analysis of collected data was done to guarantee consistency. In the event of a dispute, a resolution was made with the help of a third party.

Table 1 JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data[8]

Author	Criteria and corresponding scores									Total	%
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
Ahmed ZM, Khalil MF, Kohail AM, Eldesouky IF, Elkady A, Shuaib A.	1	1	1	1	1	1	1	1	1	9	100
Ayasrah SM, Ahmad MM, Basheti IA.	1	1	1	1	1	1	1	1	1	9	100
Meng G, Ma X, Li L, Tan Y, Liu X, Liu X, Zhao Y.	1	1	1	1	1	1	1	1	1	9	100
Raju RS, Sarma PS, Pandian JD.	1	1	1	1	1	1	1	1	1	9	100
Tang WK, Ungvari GS, Chiu HF, Sze KH, Woo J, Kay R.	1	1	0	1	1	1	1	1	1	8	88

RESULTS

Study Selection

From the electronic databases used in the study strategy, PubMed yielded 13 results, zero (0) from Cochrane Library and zero (0) from EBSCO. Out of the 13 studies in PubMed, seven articles were identified. Among these, two were excluded because they did not discuss post-stroke psychiatric morbidities but focused on psychosocial problems, quality of life and functional independence. A total of five articles fulfilled the inclusion criteria listed and were used in this systematic review. The flow chart below demonstrates the study selection process. The PRISMA flow chart below shows the study selection process.

Study Characteristics

The extracted data included the author, publication year, demographics, condition, assessment scales used, risk factors identified and results.

According to the articles reviewed, psychiatric morbidities were more commonly identified in male patients in their middle to late adulthood. Most studies utilized the Hospital Anxiety and Depression Scale (HADS). Aside from the HADS, a few articles made use of the Hamilton Anxiety (HAM-A), Hamilton Depression (HAM-D), Mini-mental State Examination (MMSE) and the Structured Clinical Interview for DSM-III-R (SCID-DSM-III-R) to identify psychiatric morbidities in this population. Higher National Institutes of Health Stroke Scale (NIHSS) scores and poor stroke outcomes (higher scores

in the Modified Rankin Scale) were associated with a higher likelihood of developing psychiatric morbidities. Depression and anxiety were the most common findings across the reports. The study by Wai-Kwong Tang and colleagues further found that major depressive episodes, adjustment disorder with depressed mood, dysthymia and generalized anxiety disorder were seen at a frequency of 7.6%, 8.2%, 1.3% and 0.6%, respectively, in the population that they deliberated. No cases of mania or psychosis were identified in their document.

CONCLUSION

Major depressive episodes, adjustment disorder with depressed mood, dysthymia and generalized anxiety disorder were the common psychiatric morbidities identified post-stroke. The HADS is the typical tool used by the studies reviewed to screen for the presence of post-stroke depression and anxiety. Males in their middle to late adulthood, with higher NIHSS scores and poor stroke outcomes (higher scores in the Modified Rankin Scale) were associated with a higher likelihood of developing psychiatric morbidities.

Limitations and Recommendations

This study was bounded by the limited articles available on the chosen topic. It was recommended to establish a specific time frame for assessing and monitoring for symptoms of psychiatric morbidities in individuals post-stroke. Identification of common
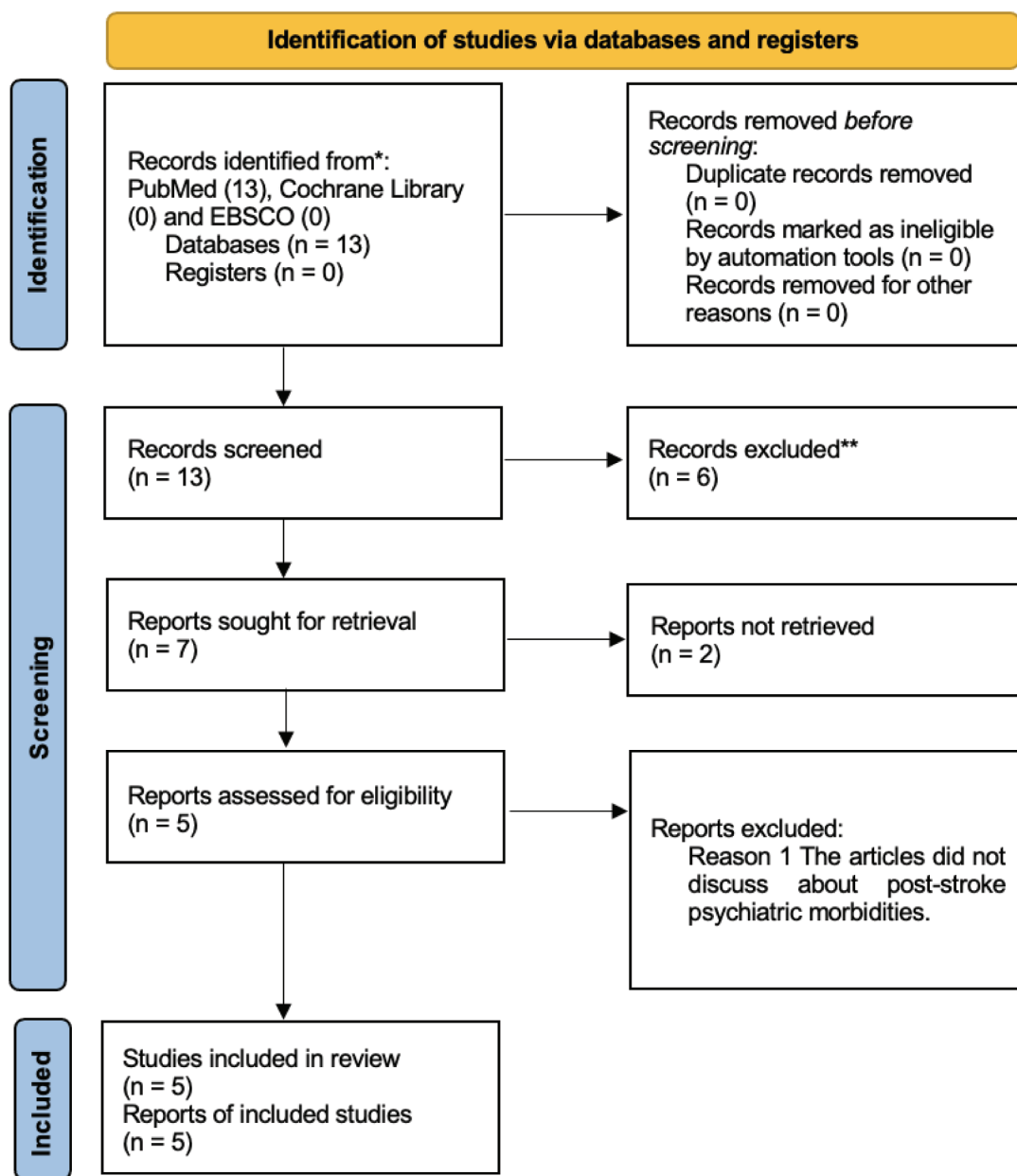
Figure 2 PRISMA Flow Diagram

lesion locations that may predispose patients to develop the aforementioned disorders may likewise be helpful. Aside from the HADS which is designed to screen for depression and anxiety, additional assessment scales that may identify further psychiatric symptoms, such as mania and psychosis, may be explored to check for additional comorbidities. Family and patient education regarding this consequence of stroke should be highlighted to increase awareness and consciousness about the condition. This would lead to increased rates of reporting, earlier intervention and improved rates of recovery.

Author	Publication Year	Study Site	Demographics	Condition	Assessment Scales Used	Risk Factors	Results
Ahmed ZM, Khalil MF, Kohail AM, Eldesouky IF, Elkady A, Shuaib A.	2020	Saudi Arabia	**Age:** 56.72 ± 11.83 **Gender: 56% males,** **NIHSS:** 7.60 ± 3.92, **MSPSS:** 5.40 ± 1.17, **mRS:** 1.64 ± 1.19, **TSH:** 2.48 ± 2.61, **MMSE:** 26.64 ± 1.37	Post-stroke Depression (PSD) and Post-stroke Anxiety (PSA)	Hospital Anxiety and Depression Scale (HADS)	Higher NIHSS scores, lower MSPSS; higher mRS and discontinuation of rehabilitation.	Clinically significant PSD was found in 36%, while PSA in 32%. PSD was associated with higher NIHSS; lower MSPSS; higher mRS and discontinuation of rehabilitation. PSA was associated with higher TSH; lower MSPSS; while discontinuation of rehabilitation was related to less PSA. NIHSS and MSPSS score were associated with PSD; while PSA was related to TSH level and discontinuation of rehabilitation.
Ayasrah SM, Ahmad MM, Basheti IA.	2018	Jordan	**Age:** 56.62 years (SD = 14.2) **Gender:** 53% males, 47% females, **HDS:** 11-21	Post-stroke Depression	Validated hospital depression subscale (HDS) of the Hospital Anxiety and Depression scale.	Low level of education, having a preparatory level of education, having comorbid chronic diseases, inability to perform daily activities by themselves, and patients with comorbid dysphasia.	Post-stroke depression is a significant health problem among Jordanian patients with stroke and warrants serious attention. Clinicians need to consider these important predictors when assessing and managing depression among patients at risk. Factors that correspondingly predicted higher depression categories were low level of education, having a preparatory level of education, having comorbid chronic diseases, patients who reported inability to perform daily activities by themselves, and patients with comorbid dysphasia.
Meng G, Ma X, Li L, Tan Y, Liu X, Liu X, Zhao Y.	2017	China	**Age:** 69.4 years (range 50–86 years); **Gender:** 51.8% males. **Co-morbidities:** 71.1% had a history of hypertension, 45.8% had diabetes mellitus, and 15.7% had atrial fibrillation.	Post-stroke Depression	NIHSS, HAM-A, HAM-D, MMSE	Higher NIHSS scores, higher HAMD scores, lower DA level, lower 5-HT level, higher tumor necrosis factor- level, and lower NGF level.	The identification of higher NIHSS scores, higher HAMD scores, lower dopamine level, lower 5-hydroxytryptamine level, higher tumor necrosis factor- level, and lower nerve growth factor level might be useful for clinicians in recognizing and treating depression in patients after a stroke.
Raju RS, Sarma PS, Pandian JD.	2010	India	**Age:** 54.3 ± 12.9 years (range, 21–88 years); **Gender:** 69.8% males	Post-stroke Depression (PSD) and Post-stroke Anxiety (PSA)	WHOQoL, HADS, FIM	Poor stroke outcome (mRS ≥ 2), older age, severe stroke (NIHSS 2.16 ± 2.1 (median 1, range 0–10)	Presence of anxiety, depression and functional dependence (low FIM scores) were associated with impaired QoL. Older age, stroke severity and presence of depression resulted in decreased independence.
Tang WK, Ungvari GS, Chiu HF, Sze KH, Woo J, Kay R.	2002	Hong Kong	**Age:** 71 ± 10 years; **Gender:** 45% males; 48.1% received no education, 29.8% only 1–6 years of education, 56% married, 33% widowed; 60.5% retired and 19.1% were housewives	Post-stroke Depression (PSD) and Post-stroke Anxiety (PSA), Post-stroke Mania and Post-stroke Psychosis	Mini-Mental State Examination (MMSE) and Structured Clinical Interview for DSM-III-R (SCID-DSM-III-R)	Sociocultural factors, tendency to deny or somatize psychiatric symptoms and low educational attainment.	The frequency of all depressive disorders was 17.2%. Major depressive episodes, adjustment disorder with depressed mood, dysthymia, and generalized anxiety disorder were diagnosed in 7.6%, 8.2%, 1.3% and 0.6% of the subjects, respectively.

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