

## PREVALENCE OF THE COMORBIDITY OF ANXIETY AND DEPRESSION IN STROKE SURVIVORS IN NIGERIA

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### ARTICLE INFORMATION

#### *Article history*

Received 01 Nov. 2023

Revised 8 Mar. 2024

Accepted 27 March 2024

Published Online 20 April 2024

### Abstract

In the past research has shown that stroke survivors commonly experience fears and worries about their well-being. This study attempted to assess anxiety and depression as comorbid mental health conditions among stroke survivors, which can negatively affect treatment outcome as well as increase mortality. Two hypotheses were postulated and tested. The participants were 847 stroke survivors that comprised of 410 males and 437 females in the age range of 18 to 65 years (mean age=59.4, SD=10.37). The stroke survivors were selected by cluster sampling from one teaching hospital and five specialist hospitals in Kano State, North-West Nigeria and one teaching hospital in Enugu State, Southeast Nigeria. Hospital Anxiety and Depression Scale (HADS) was administered to each of the participants. The study was multicenter and the design was cross sectional. The statistics used for the study was Chi-Square. The results indicated that a high proportion of stroke survivors present with comorbid anxiety and depression, which was significantly larger than those with no comorbid anxiety and depressive symptoms. There was no significant relationship between gender and comorbid anxiety and depressive symptoms. The study recommends that stroke survivors should always be referred first to clinical psychologist for screening of anxiety and depressive symptoms and possible psychotherapy. Therefore, government should increase the employment of clinical psychologist to work with other healthcare professionals in treating stroke survivors across the teaching hospitals in Nigeria.

**Keywords:** Anxiety and Depression, Comorbidity, Nigeria, Prevalence, Stroke Survivors

### Introduction

Stroke is a “rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than that of vascular origin” (World Health Organization [WHO], 1989). Furthermore, stroke occurs

when there is abrupt hindrance of blood supply to a part of the brain or due to the splitting of blood vessels in the brain, thereby causing blood to pass into the spaces that surround the brain cells (Centers for Disease Control and Prevention [CDC], 2023; Johns Hopkins University, 2023; Mayo Clinic, 2023; National Heart, Lung, and Blood Institute [NHLBI], 2023; National Institute of Neurological Disorders and Stroke [NINDS], 2023; Medical News Today, 2023).

Study conducted in Aminu Kano Teaching Hospital (AKTH), Kano and Murtala Muhammadu Specialist Hospital, Kano found out that stroke is a commonly diagnosed neurological disorder (Owolabi & Nagoda, 2012). The study of Owolabi and Nagoda (2012) states that stroke accounts for 77.6% of neurological admissions at AKTH, Kano. Furthermore, Owolabi and Nagoda (2012) reported that the occurrence of stroke in hospital settings in Nigeria ranged from 0.9% to 4.0%. Studies conducted in Nigeria have shown that stroke is the highest among the neurological admissions (Eze et al., 2013; Oparah, Njideofar & Ezedinachi, 2013 as cited in Oni, Olagunji, Olisah, Aina & Ojini, 2018). Stroke was reported as the foremost cause of disease and disability in sub-Saharan Africa (Moran et al., 2013 as cited in Ojagbemi et al., 2017).

Prevalence is defined as “the proportion or number of persons in a population who have a particular disease or attribute at a specified point of time or over a specified period of time” (CDC, 2012, pp. 3-16). Comorbidity of anxiety and depression implies the manifestation of both anxiety and depressive symptoms co-existing in the stroke survivors.

Anxiety is defined “as an emotion manifested by feelings of nervousness, apprehensive thoughts and bodily changes such as high blood pressure”. (American Psychological Association [APA], 2023, Anxiety section, para.1). This study measured generalized anxiety that includes, tension, worry, fear, panic, difficulties in relaxing and restlessness excluding the bodily symptoms as emphasized in the instrument of research. Depression is defined “as excessive sadness or

misery that lasts for many days. It can obstruct the activities of daily life and can cause physical symptoms such as pain, weight loss or gain, problems with sleep, and deficiency of vigor”. (American Psychological Association [APA], 2022, Depression section, para.1). This study focused mainly on anhedonia symptoms excluding the physical symptoms of depression as established in the research instrument.

Stroke survivors present symptoms of comorbidity of anxiety and depression and these can negatively affect the outcomes of treatments. The symptoms may also cause mortality among the stroke survivors and hence the need for this study. The stroke onset can be very frightening with fears of death and disability by the patients and their relatives leading to emotional problems that manifest as anxiety and depression (Lincoln, Kneebone, Macniven, & Morris, 2012). It was reported that anxiety and depression strongly comorbid in stroke survivors (Ayerbe, Ayis, Crichton & Wolfe, 2014).

### **Statement of the Problem**

A search of the literature indicated that most psychological research relating to stroke patients are on emotionalism and depression, with few studies on anxiety and comorbid anxiety and depression. Many of the studies are also based on medical and neuro-anatomical perspectives (brain lesion location, side of hemiparesis, stroke severity, and functional disability). There is less research on psychological aspects of stroke in Kano State, Northwest Nigeria and Enugu State, Southeast Nigeria. However, there are many stroke survivors attending Murtala Muhammadu Specialist Hospital, Kano; Muhammadu Abdullahi Wase Specialist Hospital, Kano; Sir, Muhammadu Sunusi Specialist Hospital, Kano and Aminu Kano Teaching Hospital (AKTH), Kano and also University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu that need

to be screened for the symptoms of comorbidity of anxiety and depression with a view to ascertaining the prevalence and the correlational association with gender for psychological intervention to be put in place to help the stroke survivors. Therefore, this research is seeking for answers to the research questions below:

1. What is the proportion of stroke survivors with comorbid anxiety and depressive symptoms among stroke survivors?
2. Would there be significant correlational association between gender and comorbid anxiety and depressive symptoms among stroke survivors?

### **Purpose of the Study**

The purpose of the study includes:

1. To investigate the proportion of stroke survivors that had comorbid anxiety and depressive symptoms.
2. To ascertain whether there would be correlational association between gender and comorbid anxiety and depressive symptoms among the stroke survivors.

### **LITERATURE REVIEW**

The cognitive theory/uncertainty theories of anxiety (Strongman, 1995) were the first supporting theories of this study. The cognitive theory emphasized on problems with cognition and cognitive appraisal as the basis of anxiety. It was pointed out that the cognitive system serves as the gateway to physiological system (Eysenck, 1990 as cited in Strongman, 1995, p.7). Further, uncertainty has been regarded as the core part of anxiety by all theories of anxiety, such as being uncertain of the future or what line of action to be taken in the face of disability (Strongman, 1995). Anxiety is also viewed as being dependent on uncertainty (Izard, 1991 as cited in Strongman, 1995, p.8).

Furthermore, even the individual's ability to cope is uncertain (Lazarus, 1991 as cited in Strongman 1995, p.8). The behavioural theories of depression particularly the theory which emphasized that depression frequently arises as a reaction to stressful negative events, such as a severe medical illness (Hammen, 2005 as cited in Nolen-Hoeksema, 2011) was the second working theory of this study.

Ojagbemi et al. (2017) conducted a study on prevalence and predictors of anxiety in an African sample of recent stroke survivors. The participants were 391 consecutive ischaemic or haemorrhagic stroke survivors comprising of 249 males and 142 females selected from hospitals in sub-Saharan Africa (SSA) with HADS as the instrument of research. The result showed that anxiety was comorbid with depression in 55(14.1%) of the participants. The researchers concluded that over 70% of stroke survivors with anxiety in SSA also have depression.

### **Hypotheses**

The following hypotheses were postulated and tested in this study.

1. A higher proportion of stroke survivors would report comorbid anxiety and depressive symptoms.
2. There would be significant correlational association between gender and comorbid anxiety and depressive symptoms among the stroke survivors.

## **METHOD**

### **Participants**

A total of eight hundred and forty-seven (847) participants (stroke survivors) comprising of 410 (48.4%) males and 437 (51.6%) females in the range of 18 to 65 years with mean age of 59.4 and a standard deviation of 10.37 were selected for this study. The participants were selected by cluster

sampling from one teaching hospital and five specialist hospitals in Kano State, Northwest Nigeria and from one teaching hospital in Enugu State, Southeast Nigeria due to time constraint. The sample of participants were selected from the old and new discharged stroke survivors that came for medical treatments and physiotherapy rehabilitation in the neurology clinic or medical outpatient department (MOPD) and physiotherapy department of Murtala Muhammadu Specialist Hospital, Kano (189 participants); Muhammadu Abdullahi Wase Specialist (Nassarawa) Hospital, Kano (156 participants); Sir Muhammadu Sunusi General Hospital, Kano (132 participants); Sheikh Muhammadu Jidda General Hospital, Kano (183 participants); Aminu Kano Teaching Hospital (AKTH) Kano (169 participants); and University of Nigeria Teaching Hospital (UNTH), Ituku Ozalla, Enugu (18 participants). However, during this research, there were very few stroke survivors attending the MOPD and physiotherapy department of UNTH which showed in the very few participants from UNTH. The inclusive criteria are both old and new diagnosed stroke clients that were medically treated, became stable and discharged with appointments to come back for follow up medical treatments and physiotherapy or referred to physiotherapy before going home respectively. The exclusive criteria are stroke survivors with prior history of anxiety and depression, stroke survivors with psychotic disorders, dementia, transient ischaemic attack, Parkinson's disease, acute illness, mentally deranged, incoherent, drug abuse, aphasia, dysarthria, other communication disorders, and the very aged stroke survivors.

### **Instrument**

The instrument used for this study was the Hospital Anxiety and Depression Scale (HADS) originally developed by Zigmond and Snaith to investigate states of anxiety and depression among medical outpatients attending hospital (Zigmond & Snaith, 1983). HADS is a 14-item scale and consists of 7 items each for anxiety and depression symptoms in the anxiety and depression sub-

scales (HADS-A and HADS-D) (Zigmond & Snaith, 1983). The HADS is a paper and pencil individually administered questionnaire (Julian, 2011; Smarr, 2003) but can also be administered by an interviewer (Julian, 2011). For stroke survivors with low education or problem with sight, the itemized questions can be read and explained to them (Snaith, 2003). The optimum cutoff score for the HADS-A and HADS-D subscales is 8 (Abiodun, 1994). Clients with cutoff score of 8 and above in one of the subscales or in both anxiety and depression sub-scales indicate anxiety symptoms and/or depressive symptoms (Yusif *et al.*, 2012). The HADS has been validated for use in Nigerian teaching hospitals (Abiodun, 1994). The sensitivity of anxiety sub-scale was in the interval of 85.0% to 92.9% and the specificity was in the interval of 86.5% to 90.6%. The sensitivity for depression sub-scale was in the interval of 89.5% to 92.1% and the specificity ranged from 86.6% to 91.1%. (Abiodun, 1994). By and large, the HADS can be used as a screening instrument in general hospitals settings, and community settings in Nigeria (Abiodun, 1994, Yusif *et al.*, 2012).

The present study carried out reliability and validity tests on the HADS to ascertain its usefulness for stroke survivors in Nigeria in a pilot study comprising of fifty (50) stroke survivors (participants) that came for physiotherapy at the physiotherapy department of a specialist hospital after obtaining their informed consent. The results showed that the internal consistency reliability estimate or Cronbach's alpha of the anxiety sub-scale (HADS-A) was .732 while that of the depression sub-scale (HADS-D) was .737. The internal consistency reliability estimates or Cronbach's alpha for the total scale (HADS) was .835. These indicated that the HADS and its subscales have a good internal consistency. Therefore, the HADS is reliable and valid for use in stroke survivors in Nigeria.

For use in this study, the translation of HADS into Hausa Language based on the method of back translation was done by specialists at the Department of Nigerian Languages, Bayero University, Kano and was administered to the participants who are unable to read or understand English Language.

### **Procedure**

Approvals for this study were obtained from the ethical committees of Ministry of Health, Kano, AKTH, Kano and UNTH, Ituku Ozalla, Enugu. The ethical rules provided by the ethical committees were abided to in this study which includes informed consent, and confidentiality among others.

The researcher was assisted in administering the instruments in the hospitals under the Kano State Ministry of Health / Hospitals Management Board, and AKTH, Kano by five trained research assistants who were products of health institutions in Kano State with hospital working experience. However, the researcher did the data collection alone at UNTH. The researcher and his assistants administered the HADS to the stroke survivors while they were waiting to see the doctor in the neurology clinic or MOPD. Similarly, the researcher and his assistants administered the HADS to the stroke survivors before the start of physiotherapy in the department of physiotherapy. However, for stroke survivors that were not literate, the questions in the HADS were read out and explained to them individually by the researcher or research assistants and their responses ticked. Finally, the researcher and/or his assistants thanked each participant for his/her participation in the research and wish that he/she got better.

### **Design/Statistics**



The study design was cross sectional due to time constraints, hospitals treatment schedules and the large sample size. The statistics used for this study were Chi-Square and Cramer’s V. The researcher used Chi-square test because the data are in frequency form or involved frequencies (Bankole, 1991; Howitt & Cramer, 2000). It compares proportions observed in a study with proportions expected to see if they are significantly different (Bankole, 1991). The researcher used Cramer’s V statistic because it is a measure of the association or relationship between two nominal variables (SPSS Tutorials, 2020; STats.com, 2024). Cramer’s V statistic gives a correlational association between two variables (Data Science Central, 2020). Furthermore, Cramer’s V statistic is the intercorrelation of two distinct variables and may be used with variables having two or more levels (Sheskin, 1997).

## RESULTS

The proportions of stroke survivors who presented with comorbid anxiety and depressive symptoms are presented below followed by the results on the correlational association between gender and comorbid anxiety and depressive symptoms. Each table of results also includes test of significance of the results. SPSS version 20 computer programme was used in analyzing the data.

**Table 1: Proportion of Stroke Survivors with Comorbidity of Anxiety and Depressive Symptoms**

<b>Comorbidity of Anxiety and Depressive Symptoms</b>	<b>Observed Frequency</b>	<b>Expected Frequency</b>	<b>Chi-Square Value</b>	<b>df</b>	<b>Significance</b>
<b>Comorbid Anxiety and Depressive Symptoms</b>	735 (86.8%)	423.5	458.24	1	.000

<b>No Comorbid Anxiety and Depressive Symptoms</b>	112 (13.2%)	423.5
<b>Total</b>	847 (100%)	847

The results of chi-square test in table 1 indicates that an overwhelming proportion of the stroke survivors had comorbid anxiety and depressive symptoms (735, 86.8%), which was significantly larger in proportion than those who did not have comorbid anxiety and depressive symptoms (112, 13.2%):  $\chi^2 = 458.24$ ,  $df = 1$ ,  $p < .001$ .

**Table 2: Correlational Association between Gender and Comorbid Anxiety and Depressive Symptoms**

<b>Gender</b>	<b>Number with Comorbid Anxiety and Depressive Symptoms</b>	<b>Number with No Comorbid Anxiety and Depressive Symptoms</b>	<b>Total</b>	<b>Cramer's V</b>	<b>df</b>	<b>Significance</b>
<b>Male</b>	356 (86.8%)	54 (13.2%)	410	.001	1	.97
<b>Female</b>	379 (86.7%)	58 (13.3%)	437			

The results in table 2 shows that 356 (86.8%) male stroke survivors had comorbid anxiety and depressive symptoms compared with 379 (86.7%) females who had comorbid anxiety and depressive symptoms. Cramer's V result indicates that there was no significant relationship between gender and comorbid anxiety and depressive symptoms among the stroke survivors:  $\phi_c = .001$ ,  $p = .97$ .

## DISCUSSION

The first finding of the study shows that an overwhelming proportion of the stroke survivors reported comorbid anxiety and depressive symptoms and this supported the first hypothesis. There

is scarcity of recent studies on the comorbidity of anxiety and depression in stroke survivors. However, one study has shown the comorbid of anxiety and depressive symptoms in stroke survivors (Ojagbemi et al., 2017).

The second finding of the study indicates that there was no significant correlational association between gender and comorbid anxiety and depressive symptoms among the stroke survivors which implies that the second hypothesis was rejected. The search of existing literature indicates scarcity of recent studies on gender and comorbidity of anxiety and depression in stroke survivors. There was no significant correlational association between gender and comorbid anxiety and depressive symptoms in the study because based on the empirical observation of the researcher, the female stroke survivors of this study have a lot of social support from their families. The female participants were accompanied to the hospitals by their children, husband, parents, or other family members and were shown care, love, and compassion by them. Studies have shown that during the times of need, women have more network of social support than men (Nolen-Hoeksema, 2011), and this has confirmed the empirical observation of the researcher. Therefore, the saying that females reported more anxiety and/ or depression than males does not apply to the female stroke survivors of this study.

On the above second finding, there were criticisms in the literature of those studies that mentioned women as being more expressive of anxiety and depressive symptoms than men (Madden, Barrett, & Pietromonaco, 2000). Madden et al. 2000 criticized those studies as sex (gender) based stereotypes that females are highly assertive of fear and sadness than males, and this is aggravated by the researcher's wishful outcome that cause females to answer in a way that will portray the wishful outcome or generalization, the test administrator may also be more incline in seeing females' expressions of fear and sadness than that of males. By and large the studies are

Western and guided by the notion that females in the Western countries exhibit higher anxiety and depressive symptoms than their male's counterparts (Madden et al., 2000).

### **Implications of the Findings**

The implications of the findings are categorized into two; theoretical and practical. The theoretical implication was that the stroke survivors would be having disturbing thoughts, worries, fear, and feelings of uncertainties of life. Also, stroke being a severe medical illness with physical disability would cause the stroke survivors of this study to be living with comorbid anxiety and depression. Consequently, their body immunity would be lowered because the emotional problems of the mind have adverse effects on the immune system (Mestel, 1994), and this might lead to mortality among the stroke survivors.

The practical implication was that from the result of the study, stroke survivors should always be referred first to clinical psychologist for screening of anxiety and depressive symptoms and possible psychotherapy. There is also the need for the employment of clinical psychologist to work with other healthcare professionals in treating stroke survivors.

### **Limitations of the Study**

1. Time is the major limitation of this study because of the need to conform to the academic calendar. The researcher conducted this research in specialist hospitals and teaching hospitals, and waited for some time to get ethical approval. The research was psychological epidemiology. The researcher took one and half years in planning and conducting the research.
2. This research is multicenter with all the hospitals or the research centers located at various places. Therefore, the researcher has the added task of coordinating the research assistants.

3. Financial constraints were also a problem. The researcher used stationeries, paid for Transportation, and remunerated the research assistants which are a burden for the researcher. based on the current economic recession in the country.
4. This study was not longitudinal and not diagnostic because of time limitations.

## **CONCLUSION**

Based on the higher proportion of stroke survivors with comorbidity of anxiety and depression, there is the need for attention to equally be given to these psychological problems experienced by them because the comorbid anxiety and depressive symptoms are as worrisome and generally debilitating as the medical problems presented initially by the stroke survivors. Psychotherapy needs to be included in the management of stroke survivors.

## **RECOMMENDATIONS**

Stroke survivors attending Neurology Clinic and Medical Outpatient Department (MOPD) should be regularly screened for anxiety and depression. Clinical psychologist should be employed as a full-time member of the Neurology team/unit to among other functions screen stroke survivors for anxiety and depression and give psychotherapy when needed. Public awareness programmes on all facets of stroke. There should be regular measurement of the blood pressure and glucose level of stroke survivors attending neurology clinic and MOPD. This is to prevent them from having a second stroke.

Hypertensive and diabetic clients attending the hospitals should be adequately treated and monitored to prevent them from developing stroke. This is because hypertension and diabetes are modifiable risk factors of stroke. Stroke units/centers should be established in the specialists and

teaching hospitals where the study was conducted to be managed by multidisciplinary team of healthcare professionals that specialized in the treatment/therapy of stroke survivors including clinical psychologists.

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