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Research Article

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Post-Stroke Cognitive Impairment and Depression: Examining the Influence of Social Support in a Nigerian Tertiary Hospital

Israel Ebubechukwu Okeke*, Idongesit Ayemo Ubi

Clinical department Federal Neuropsychiatric Hospital Calabar

***Corresponding author:** Israel Ebubechukwu Okeke, Clinical department Federal Neuropsychiatric Hospital Calabar.

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Abstract

Background: *Social support is very vital in preventing /reducing psychiatric sequelae such as post-stroke cognitive impairment and depression but little or no attention is given to this aspect of care in stroke management. There is much attention given to the physical rehabilitation of stroke survivors with little or no attention given to the Psychosocial would be preferred aspect of stroke management.*

Aim: *To investigate the association between social support with cognitive impairment and depression among stroke survivors at the University of Calabar Teaching Hospital (UCTH), Calabar, Nigeria.*

Materials and Methods: *This cross-sectional study was conducted among stroke survivors at the University of Calabar Teaching Hospital. All the stroke survivors had a CT-scan confirmed stroke. A consecutive sampling method was used to recruit respondents. The following questionnaires were administered to 122 stroke survivors. Sociodemographic/clinical questionnaire, National Institute of Health Stroke Scale (NIHSS), The Mini-International Neuropsychiatry Interview (MINI)-Depression module, Mini-Mental State Examination (MMSE), Oslo Social Support Scale (OSSS-3), and the Modified Rankin Scale (MRS). The data were analysed using SPSS version 25.*

Results: *The study recruited 122 stroke survivors. The mean age of the participants was 60.23 ± 13.0. The proportion of male respondents was 62.3%, while that of female respondents was 37.7%. Respondents aged 18 to 39 had the highest level of social support (62.5%) while males (56.6%) had more social support than females (41.3%). The study showed that respondents who had strong social support were less cognitively impaired (49.0%) while respondents with depression (57.8%) had stronger social support. The relationship between social support with cognitive impairment and depression was not statistically significant. Also, respondents with strong social support had mild stroke severity with moderate stroke related disability*

Conclusion: *The results of the study showed that social support could have some beneficial effect on stroke survivors in reducing cognitive and functional impairments. Further research in this area would shade more light on the impact of social support on psychiatric co-morbidities in stroke patients.*

Keywords: *Stroke Survivors, Social Support, Post-Stroke Cognitive Impairment, Post-Stroke Depression, Stroke Rehabilitation, Neuropsychiatric Complications, Stroke Severity, Functional Disability.*

Introduction

Background

A stroke is a medical emergency that is currently defined as a sudden neurological impairment caused by a spontaneous bleeding or blockage in the central nervous system, leading to proof of tissue damage, regardless of how long the symptoms have been present [1]. The term stroke is believed to have been introduced into the medical literature only in the late seventeenth centurya 1.

Globally, 1 in 4 adults above 25 years will have a stroke in their lifetime. Over 110 million people around the globe have had a stroke [2]. and every minute, six Africans develop a stroke [3]. The recent prevalence rate of stroke in Nigeria is 1.14 per 1000, while the monthly fatality rate is as high as 40% [4].

Stroke has been linked with mental disorders such as depression, anxiety, apathy, and cognitive impairment [5]. Depression is the most common neuropsychiatric consequence of stroke, affecting about 33% of stroke patients [6]. Anxiety disorder is the second most common neuropsychiatric complication, with a prevalence rate of 25% [7]. Deficits in one or more domains of cognitive function are widespread after a stroke 8. Apathy without depression is linked with a loss of interest, while mania is rare in stroke patients. In addition, Out-of-proportion emotional outbursts characterise pathological affective disorder, while catastrophic reactions in stroke patients are associated with a burst of aggressive behaviors, anxiety, and crying [8, 9].

The social impact of having a stroke is considerable and stroke survivors take part in fewer social activities [10]. Family life is disrupted and contact with friends, and the wider network is diminished. Social isolation is a commonly reported sequelae and may disproportionately affect those with aphasia (language difficulties) [11]. There is a need for strong social support in stroke survivors so as to enable them to overcome social isolation and the mental health implications. Social support is defined as the exchange of physical or emotional resources between the provider and the recipient with an intent to improve the recipient's wellbeing [12]. It is the assistance an individual receives from social networks that enables the person's activities of daily living especially in critical situations12. Sources of social support can be family, relatives, friends, neigbours , and significant others from the community Sources of social support can include family, friends, and neighbours [12].

Besides objective support (actual support), and subjective support (perceived support), the support seeking behavior of an individual may also affect their wellbeing [10]. There is cumulative evidence suggesting that. perceived support which implies a recipient subjective judgement that providers such as family members of friends will offer aid during a time of need is more consistently linked to mental health status than received support [13]. Social support provided within an individual's social network is crucial in helping people adapt to life after a chronic illness such as stroke11. A study by Li et al.on the relationship between social support with cognitive impairment after stroke observed no significant association between the Social Support and Post-stroke cognitive impairment [14].

However, a study on the association between social support and cognitive function in Mexican adults aged 50 years and above showed that while there was an inverse relationship between cognitive impairment and social support for patients aged 71-80years, the same association was not observed for adults of other ages [15]. Patients younger than 70years did not show an association between social support and cognitive impairment, while those above 80 years, social networks were not enough to help diminish the negative impact of cognitive impairment [16]. This shows that the relationship between social support and cognitive impairment might be related to age and not necessarily to the amount of social network. There were no African and Nigerian studies on the relationship between social support and cognitive impairment among stroke to the best of my knowledge from my search.

Social support is a well-documented protective factor in the development of depressive symptoms in the acute phase after stroke 16. Social support has also been found to be a protective factor against depression in individuals without stroke 17. Moreso emotional support from parents, spouse, kins, friends and other known persons appears to reduce depressive symptoms [17]. A study by Bi et al showed that the odds of depression was lower in patients receiving a higher level of social support but higher in patients receiving weaker level of social support [12]. Villian et al. also discovered that the level of patients' satisfaction with perceived social support within 24 hours after recovering from stroke influenced the level of depression at 3 months post-stroke [12]. Another study showed that perceived support protected patients against post-stroke depression [10]. A study conducted by Kang et al. revealed a strong link between social support and post-stroke depression [18]. The study concluded that insufficient social support could contribute to the development of PSD. Therefore, interventions aimed at enhancing social support may be beneficial in managing PSD [18].On the contrary, a study found that patients with a significant amount of social support had an elevated risk of post-stroke depression [11].Few studies have looked into the relationship social support and post-stroke depression in Nigeria. A study by Olibamoyo et al. showed that stroke survivors with social support had a 16.7% risk of depression compared with 90% by survivors with poor social support and the relationship between social support and post-stroke depression was statistically significant [19].

Justification

Social support is vital to stroke survivors in reducing psychiatric comorbidities such as cognitive impairment and depression. Studies have shown that social support could help reduce post stroke depression, but little is known about the role of social support in preventing cognitive impairment among stroke survivors. This study hopes to look into how social support is beneficial to stroke survivors in reducing both post-stroke cognitive impairment and depression as there is paucity of studies in Nigeria that have looked into these associations. The impact of stroke is enormous on stroke survivors, leading to loss of function and social isolation. This further complicates the recovery and rehabilitation of stroke survivors. This study hopes to look at how stroke survivors with strong social support navigate the effect of stroke related disability as there is little or no study that has looked at this relationship in Nigeria. In addition. This study hopes to look at how social support and stroke severity is related as there is paucity of studies that have looked into this relationship in our environment.

Aim and Objective

To determine the association between social support with post-stroke cognitive impairment and depression and also its relationship with stroke severity and stroke related disability.

Specific Objectives

1. To determine the relationship between social support with cognitive impairment among stroke survivors at UCTH

2. To evaluate the relationship between social support with depression among stroke survivors at UCTH.
3. To determine the relationship between social support with stroke severity and stroke-related disability at UCTH.

Study hypotheses

1. There is an association between social support and depression among stroke survivors.
2. There is an association between social support and cognitive impairment among stroke survivors.

Methodology

Chapter Two

Location of Study

Calabar is the capital of Cross River State and is located in southern Nigeria. It has a population of 371,022 from the 2006 census. The Atlantic Ocean bounds the metropolis on the south, Odukpani L G A on the north, Akpabuyo L G A on the East, and the Calabar River on the west [21]. Administratively, it is divided into two—Municipal and South- and comprises three major tribes: Efik, Efut, and Qua. Its people are known for their rich cultural heritage, tourism, and hospitality. As a Cosmopolitan city, almost everyone understands and speaks English. Calabar has three tertiary hospitals: the University of Calabar Teaching Hospital, the Navy Reference Hospital, and the Federal Neuropsychiatric Hospital. This study was done at the UCTH, established in 1979, to provide tertiary health care services [22]. The facility is a six-hundred-and-ten-bed space hospital located at Calabar in Calabar Municipality. Clinical services are available in all specialised medical departments, such as Surgery, Internal Medicine, Paediatrics, Orthopaedics and Trauma, Anaesthesiology, Obstetrics and Gynaecology, and Psychiatry [22].

The internal medicine department comprises Neurology, Cardiology, Nephrology, Endocrinology, Respiratory, Dermatology, and Rheumatology units [22]. This study was carried out at the Neurology clinic of the Internal Medicine department. Initially(before 2023), the neurology clinic ran only on Mondays, but with the introduction of the Friday clinic, dedicated to stroke patients, it expanded its schedule. Data from the medical records in 2021 showed that the neurology clinic attended to eight hundred and twelve patients, with stroke cases constituting the majority (about 609 stroke cases). With an average of 50 stroke cases per month, about 13 stroke cases per week were seen in 2021. Most of these cases were new (an average of 7 new cases per week), with others coming for follow-up visit. The stroke centre/clinic which was commissioned in 2023 further increased the number of stroke cases seen by the neurologist (Friday clinic). Stroke patients must routinely have a CT scan report in the Neurology clinic.

Study Design

The study was a cross-sectional study.

Study Population

Participants were adult stroke survivors 18 years and above at the University of Calabar Teaching Hospital.

Inclusion Criteria

1. Brain CT-scan confirmed stroke survivors within 1 month to 5 years after stroke.
2. Patients who gave consent for the study.

Exclusion Criteria

1. Those having a history of pre-stroke depression.
2. Patients receiving treatment for dementia pre-stroke.
3. Patients with severe language or physical impairment sufficient to prevent assessment.
4. Those who cannot understand the English language.

Sample Size Calculation

The study used the Cochran formula for calculating sample size for a known prevalence rate.

$$n=\frac{z^2pq}{d^2}.$$

n=sample size required

Z=1.96 from a z-table at a 95% confidence interval.

p=prevalence of post-stroke depression from previous study=31% [23].

q= 1-p

margin of error (5%)

$$n=\frac{(1.96\times1.96)(0.31)(0.69)}{(0.05)^2}$$

$$n=\frac{0.82171824}{0.0025}$$

Assuming a 10% non-response rate, the sample size increases, thus [23].

$$Na=\frac{n}{1-10\%}$$

$$Na=\frac{328.68}{0.9}$$

na=365.2

For a proposed study duration of 6 months, with an approximate population of 7 new cases per clinic day.

N=26(weeks)x7x1(clinic days) =182

Using an estimated population of 182, the sample size calculation for a population of less than 10000 was calculated using the formula

$$nf=\frac{n}{1+(\frac{n}{N})}$$

Where nf = desired sample size when study population <10000

n=desired sample size when study population>10000

N= Estimated population size

$$\text{Thus nf}=\frac{365.2}{1+(\frac{365.2}{182})}$$

Nf = 122

Sampling Technique

Those who satisfied the intake requirement were consecutively recruited into the study as they came for clinic visits.

Tudy Instruments

The Socio-Demographic/Clinical Questionnaire

The SDQ was an interviewer-administered pro forma questionnaire involving SDQ parameters like gender, marital status, tribe, denomination, employment level, educational attainment, and monthly earnings. The clinical variables, like stroke location and type, were obtained from the CT-scan report. In contrast, the number of stroke episodes and co-morbid disease conditions was obtained from the participant's case file.

Mini International Neuropsychiatric Interview (Mini Version 7.0)

MINI was produced in 1990 by clinicians in the US and Europe for DSM-III-R and ICD-10 psychiatric disorders and is a quick, structured diagnostic interview with an administrative time of about 15 minutes The MINI is an organised mental health questionnaire to assess and monitor epidemiological studies and drug

experiments [24]. Psychiatrists and health organisations use it widely in over 100 countries MINI is updated regularly and currently covers DSM-IV and DSM-5 psychiatric disorders with MINI versions 6.0 and 7.0, respectively. Its reliability score is high (kappa score more than 0.75) for major depressive disorder [25]. Compared with other diagnostic instruments, like the structured clinical interview for DSMIII, MINI does not take much time to administer [26]. It has been widely used in Nigerian studies [19-27]. The depression module of the MINI will be used in this study. The MINI have been validated for use in Nigeria [28].

Mini-Mental State Examination (Mmse)

MMSE is used to evaluate for cognitive impairment, grade the severity of cognitive impairment at any particular time, follow up fluctuations in patients' cognition, and note patients' response to treatment [29].The Mini-mental state examination is graded on a scale of 0-30, with values equals to or higher than 24 interpreted as normal cognition.

A score range of 0-17 means severe cognitive impairment, while a score of 18-23 equals mild impairment. When interpreting the MMSE, consider the patient's native language, educational level, and culture, as these factors affect performance [30]. It has a sensitivity of 81% (95%CL, 78%to 84%) and specificity of 89% (95%CL, 87%to91%) [31]. It has been widely used in Nigerian studies [19-32]. It has also been validated for use in Nigeria [33].

National Institute of Health Stroke Scale (Nihss)

The NIHSS is a tool used to measure the severity of stroke. It is typically used in clinical settings to assess and monitor the neurological status of acute stroke patients, determine appropriate care, and facilitate communication between healthcare providers. Additionally, the NIHSS can help predict both immediate and long-term outcomes for stroke survivors [34].

The NIHSS comprises assessments graded on a scale, and patients can be evaluated quickly in less than 10 minutes. The grading system ranges from zero, indicating some level of dysfunction. The average total score is 42, with the lowest score being 0. The grading system is as follows: no stroke symptoms are graded at zero, mild symptoms at 1-4, and average symptoms at 5-15. Average to severe stroke symptoms at 16-20, and severe symptoms at 21-42. This tool has been used in several studies in Nigeria [19-35]. It has also been validated for use in Nigeria [36].

Modified Rankin Scale (Mrs)

The MRS is a rating scale used to assess stroke patients' functional independence level compared to their pre-stroke functions rather than evaluate their ability to perform a specific task. It is a single-item scale administered by an interviewer. Based on the following scoring, a single MRS score should be given: no symptoms 0, no significant disability despite symptoms =1, minor dysfunction: not able to perform all previous functions but can take care of oneself without assistance = 2, average dysfunction: needs a certain level of support but can ambulate without support=3, average-severe dysfunction: can't ambulate and take care of oneself without support=4, severe dysfunction: urinating on oneself, permanently bedridden with the need for regular nursing attention=5 [35-37]. MRS has a kappa score of 0.78 [38]. It has been widely used in Nigerian studies [38, 39]. It has been validated for use in Nigeria [39].

Oslo Social Support Scale (Osss-3).

The OSSS-3 is a short questionnaire used to measure the amount of social support received. [40]. It contains only three items that ask about the number of firm friends, the feeling of care from other individuals, and the association among neighbors to get feasible help. The overall scoring can be grouped into three primary levels of social support: 1) 3-8 low help, 2) 9-11 medium help, and 3) 12-14 vital help [41]. It has a Cronbach alpha value of 0.640 [42],and has been used in many studies in Nigeria [41, 42].It has been validated for use in Nigeria [43]. The estimated time to complete all the questionnaires was 15 minutes.

Pre- Testing

A pre-test was conducted with 10% of the sample size (12 participants) at the diabetic clinic of UCTH on 7/2/23. The study was conducted by the researcher and two trained research assistants. The questionnaires were test-run to ensure consistency with the results obtained.

Ethical Consideration

Ethical clearance was obtained from the research committee of the University of Calabar Teaching Hospital. Patients were informed that their participation was voluntary and that there would be no foreseeable risk. They could withdraw their consent at any point during the study. Written informed consent was obtained from the patients. Referral for treatment was offered to those who screened positive for any domains assessed in the study.

Procedure

This study was carried out by the researcher and two research assistants. The research assistants were health personnel who were properly trained by the supervising consultants. Using the Neurology registry of the records department of UCTH, case notes of patients present for clinic each Monday and Friday were obtained. The case files of each patient were assessed to ascertain those that met the inclusion criteria. Those who met the inclusion criteria were taken into a separate clinic room, where the study was properly explained to them; thereafter, a written informed consent was obtained from the patients. Afterwards, the patients were attended to by their doctors for treatment, and then the study instruments were administered. An interviewer from the research team administered the Socio-Demographic Questionnaire.

The trained research assistants administered the Modified Ranking Scale Questionnaire, the NIHSS, the OSSS-3, and the MMSE. Thereafter, the researcher administered the depression module of the MINI version 7.0 Questionnaire. Codes were used to identify the questionnaires, and the case notes of participants were marked discreetly to avoid assessing twice. The filled questionnaires were collected for analysis. An average of ten to twelve stroke patients were recruited per week, and the study lasted for 3 months (from May to July 2024).

Data Management

The data were analysed using the Statistical Package for Social Sciences (SPSS)version 25 and the p-value set at less than 0.05.

Results

Chapter Three

This study was a cross-sectional study done among stroke patients with 122 participants. The study aimed to assess the role of social support in preventing cognitive impairment and depression among stroke survivors at UCTH. The following results will be discussed in line with the study objectives.

Table 1: Sociodemographic Characteristics of the Respondents

Variable	Frequency	Percentage (%)
Age		
18-34	5	4.1
35-49	24	19.7
50-64	49	40.2
65 and above		
Mean(±SD) 60.23±13.0	44	36.0
Gender		
Male	76	62.3
Female	46	37.7
Marital Status		
Married	112	91.8
Single	10	8.2
Ethnicity		
Efik	30	24.6
Ibibio	17	13.9
Igbo	18	14.8
Yoruba	1	0.8
Others	56	45.9
Level Of Education		
Primary	14	11.5
Secondary	41	33.6
Tertiary	67	54.9
Religion		
Christianity	120	98.4
Islam	1	0.8
Traditional	1	0.8
Occupation		
Employed	28	23.0
Self-employed	48	39.3
Unemployed	46	37.7
Monthly Income		
30000 Naira and Less	13	10.7
31000 to 99000 Naira	66	54.1
100000 Naira and Above	43	35.2

SD-Standard deviation

Sociodemographic Characteristics of the Respondents

Sociodemographic Characteristics of the Respondents unemployed (37.7%), with an income of thirty-one thousand A total of 122 patients were recruited for the study, comprising naira and above (54.1%). Furthermore, more than half of the 76 males (62.3%) and 46 females (37.7%). Most respondents' population had[k10.1] tertiary education (54.9%). A greater percentage were married (91.8%), Christians (98.4%), and above 50 years of the respondents (45.9%) were from other tribes in Cross River of age (40.2%). They were mainly self-employed (39.3%) and State, with 24.6% from the Efik tribe (Table 1).

Table 2: Relationship between sociodemographic variables and social support

Variables	Strong	Poor	Statistics	df	p-value
Age					
18 to 39	5(62.5)	3(37.5)			
40 to 59	27(48.9)	23(51.1)	X^2=0.50	2	0.77
60 and above	35(50.7)	34(49.3)			
Gender					
Male	43(56.6)	33(43.4)			
Female	19(41.3)	27(58.7)	X^2=2.67	1	0.19
Marital Status					
Married	58(51.8)	54(48.2)			
Single	4(40.0)	6(60.0)	X^2=0.51	1	0.47
Level of Education					
Primary	7(50.0)	7(50.0)			
Secondary	16(39.0)	25(61.0)	X^2=3.75	2	0.15
Tertiary	39(58.2)	28(41.8)			
Employment Status					
Employed	40(52.6)	36(47.4)			
Unemployed	22(47.8)	24(52.2)	X^2=0.26	1	0.60
Monthly Income					
30000 Naira and Less	9(69.2)	4(30.8)			
50000 Naira and less	26(42.6)	35(57,4)			
100000 Naira and above	21(53.8)	18(46.2)	X^2=3.47	2	0.17

Relationship Between Sociodemograhic Factors and Social Support

The table showed that respondents aged 18 to 39 had the highest level of social support (62.5%) while males (56.6%) had more social support than females (41.3%). Respondents who were married (51.8%), employed (52.6%) with tertiary level of education (58.2%) and those with the lowest monthly income (69.2%) had the highest-level social support. The relationship between the various sociodemographic variables and social support was not statistically significant.

Table 3: Relationship between social support with Cognitive Impairment and Depression

Variable	Strong	Poor	Statistics	df	p-value
Cognitive Impairment					
Yes	24(49.0)	25(51.0)	X^2=0.11	1	0.73
No	38(52.1)	35(47.9)			
Depression					
Yes	26(57.8)	19(42.2)	X^2=1.38	1	0.24
No	36(46.8)	4(53.2)			

The Relationship Between Social Support with Cognitive Impairment and Depression

The table shows that respondents with strong social support had a lower prevalence of cognitive impairment (49.0%). However, respondents with strong social support had a higher prevalence rate of depression (57.8%). The relationship between social support with cognitive impairment and depression was not statistically significant.

Table 4: The relationship between social support with stroke severity and stroke related disability

Variables	Good	Poor	Statistics	Df	p-value
Stroke Severity					
Mild	30(53.6)	26(46.4)			

Moderate	29(48.3)	31(51.7)	X^2=0.32	2	0.85
Severe	3(50.0)	3(50.0)			
Stroke related disability					
Mild	22(44.9)	27(55.1)			
Moderate	38(55.9)	30(44.1)	X^2=1.61	2	0.44
Severe	2(40.0)	3(60.0)			

Relationship Between Social Support with Stroke Severity and Stroke Related Disability

The table shows that respondents with strong social support had the least severity of stroke (53.6%) and respondents with strong social support had moderate stroke related disability (55.9%). The relationships between social support with stroke severity and stroke related disability were not statistically significant.

Discussions

The study showed that respondents who had good social support were less cognitively impaired (49.0%) than those with poor social support (51.0%) but the relationship between social support and cognitive impairment was not statistically significant. The study also showed that more respondents with good social support had depression (57.8%) but the relationship between social support and depression was not statistically significant. Respondents with good social support had mild stroke severity with moderate stroke related disability. The results of the study will be discussed in line with the study objectives.

Relationship Between Social Support and Cognitive Impairment Among Stroke Survivors

The study showed that respondents with strong social support had less cognitive impairment but the relationship between social support and cognitive impairment was not statistically significant(p=0.73), This corresponds with a study by Li et al which showed no statistically significant association between social support and cognitive impairment [14]. This is also similar to another study by Saeed et al on the association of age, gender, stroke location, and social support with depression and cognitive impairment after stroke which showed no significant correlation between social support and the development of cognitive deficit after stroke [44]. However study by Aminah in Malaysia on factors influencing cognitive impairment among stroke patients showed that patients with high social support had less cognitive impairment and the relationship between social support and cognitive impairment among stroke patients was statistically significant [45]. The study assessed social support using the procession of social relation scale(PSR) which is a five-item questionnaire assessing social support in the domains such as attachment, social integration, reassurance of warmth, reliable alliance and guidance. This might have accounted for the difference in the results obtained.

Relationship Between Social Suport and Depression Among Stroke Survivors

The study showed that respondents with good social support had a higher prevalence of depression and the relationship between social support and depression was not statistically significant. This is similar to a study by Lewin et al. which showed that patients with significant amount of social support had an increased risk of post-stroke depression and the relationship between social support and depression was not statistically significant [10]. This might be because post-stroke depression results from damage to the brain region that regulates emotions, and social support might have little or no effect on the development of depression in stroke survivors. Other studies showed a relationship between social support and post-stroke depression. A study by Bi et al showed that the odds of depression were lower in patients receiving a higher level of social support but higher in patients receiving a weaker level of social support [12]. Villian et al. also discovered that the level of patients' satisfaction with perceived social support within 24 hours after recovering from stroke influenced the level of depression at 3 months post-stroke [12]. The above studies are systematic reviews which included longitudinal studies, and this might have caused the variability in the results obtained. A Nigerian study by Olibamoyo et al. showed that stroke survivors with social support had a 16.7% risk of depression compared with 90% by survivors with poor social support and the relationship between social support and post-stroke depression was statistically significant [19]. The study used perceived social support to subjectively assess the level of social support in stroke survivors which might have accounted for the variability in the results obtained.

4relationship Between Social Support with Stroke Severity and Stroke-Related disability

The study showed that respondents with mild stroke and functional impairment had good social support although the relationship between social support with stroke severity and stroke related disability were not statistically significant. This relates to a study by Glass et al on the impact of social support on outcome in first stroke which revealed that high levels of social support were associated with faster and more extensive recovery of functional status after stroke [46]. Also, a systemic review by Elloker etal. Showed that high levels of social support had a positive influence on participation in, social and leisure activities as well as returning to work post-stroke [47]. Another study by Tsouna-Hadjis et al. showed that patients with moderate/severe strokes with high levels of social support attained a significantly better functional status than those with less social support [48].

Study Limitations

1. The study design was cross-sectional, which limits the inference of causality between the associations found.
2. The exclusion of severe aphasic patients, an important study population, might have limited the study's generalizability.
3. Percieved social support may have gotten a more positive correlations between social support and the psychiatric co-morbidities assessed as some studies have shown that perceived social support is more consistently linked to mental health status.

Conclusion

The study showed that strong social support could be beneficial to stroke survivors as it could help reduce cognitive and functional impairments associated with stroke. This could go along way in both the physical and psychological recovery of stroke patients thereby improving treatment outcome.

Recommendations

1. Social support schemes should be established by stroke units for stroke survivors to fast track their recovery process
2. Psychological assessment and screening should be an integral part of stroke management for early detection of psychiatric co-morbidities.
3. Future research should consider longitudinal studies to help establish a causal relationship(s) between social support with post-stroke cognitive impairment and depression
4. The government should fund further research on the psychological aspect of stroke management to aid in a better understanding of the impact of these conditions on stroke survivors.

Declarations

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the research committee of the University of Calabar Teaching Hospital and the research was conducted in accordance with the 'Helsinki' declaration. Patients were informed that their participation was voluntary and that there would be no foreseeable risk. An informed verbal / written c, consent was obtained from the patients. Referral for treatment was offered to those who screened positive for any domains assessed in the study.

Clinical trial number not applicable.

Availability of Data and Materials

The data set used and/or analysed during the current study are available from the corresponding Author on reasonable request.

Competing Interest

The Authors declare they have no competing interests.

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