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Relation between Data Assessment and Functional Status of Patients with Stroke

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Abstract:
Background: Evaluating patient with stroke through data assessment and 9ts relation with functional status, help the healthcare providers to develop a comprehensive treatment plan that addresses patient acute medical needs and long-term functional outcomes. **Aim:** To assess the relation between data assessment and functional status of patient with stroke. **Design:** Descriptive research design was used. **Subject and setting:** Eighty (80) adult patients diagnosed with Stroke admitted in Neurological department and outpatient clinic at Psychiatry, brain, and Neurosurgery Hospital at Assuit University. **Tools:** Three tools were used **(I)**; Patient Assessment questionnaire, **(II)**; Modified National Institutes of Health Stroke Scale (mNIHSS) and **(III)**; 12-Item Short Form Survey (SF-12). **Results**: More than half of the studied patients >60 years old, females, attended secondary school, non-working individuals, married and with medium income. The majority of patients had a combination of chronic diseases (hypertension). Ischemic stroke was more common than hemorrhagic stroke affected the left-side. The majority of patients eat fatty diet, smokers, had moderate to severe stroke severity. Those patients had a varying degree of impairment in different functional domain with a score of less than 50 on the SF-12 questionnaire (indicating worse health-related quality of life). **Conclusion:** There was a significant difference between the health related QOL and mNIHSS Scale total scores with different age, occupations and income among the patients, but no relation found regarding patients sex, educational level, marital status and their habits. **Recommendations:** Provide rehabilitation therapy which focus on improving health-related quality of life will help patients to recover and improve their functional abilities through the appropriate treatment, and addressing the physical, emotional, and social aspects of health.

Keywords: Assessment data, Functional status & Patient with stroke.

Introduction
A stroke or cerebrovascular accident (CVA) is defined as an abrupt onset of neurological deficit that is attributable to a focal vascular cause, either ischemic or hemorrhagic. Ischemic stroke happens when there is loss of blood flow to part of the brain, so the brain cells cannot get the oxygen and nutrients they need from the blood, and start to die within a few minutes. This could cause brain damage, long term disability, or even death **(Kasper et al., 2015).**

Stroke types are transient ischemic stroke (TIA), which known as medical emergencies, and it is the most common form of stroke (80%). Transient ischemic stroke usually caused by a blood clot. Another type is the Hemorrhagic stroke which also known as cerebral hemorrhage or intra cranial hemorrhage. It is usually occurred when a blood vessel in the brain explosion and bleeds into the brain. It is about 5% of the cases **(Sabogal, 2016).**

Stroke is at highest rate in northern Egypt and in Cairo. Stroke is the major health problem among the developing countries, as the prevalence rate of stroke in Egyptian population was significantly higher than in the other Arab countries **(Abedallah et al., 2018).**

Stroke is the second leading cause of death worldwide, in United States, about 800,000 people each year suffer from stroke and approximately two thirds of these individuals survive and require rehabilitation which may result in survival with permanents sequelae in physical, psychological, and/or social functions. The most common physical impairments of stroke are spasticity, decrease or absent sensation ,decrease muscle strength ,decreased motor control ,decrease cardiorespiratory fitness, decrease balance (static and or dynamic), increase or decrease tone and decrease proprioception **(Srinivas et al., 2021)**

Some causes of stroke are more frequent occurred in adults less than 45 years old compared to more aged populations', as hypertension, alcoholism, smoking and dyslipidemia which are the most common causes of stroke among elderly. Whereas infections, smoking, alcoholism, obesity, type 2 diabetes mellitus, head injury, sexual promiscuity, use of oral contraceptives, migraine, use of illicit drugs and pregnancy or puerperium and hypertension are significantly associated with functional status as individual`s ability to perform normal daily activities which required to meet the basic needs,

fulfill usual roles, and maintain health and wellbeing (**Memis et al., 2016)**

Functional status of patient after stroke is the ability to regain their normal live and their abilities before stroke, and it may be used as an indicator of the severity of a person`s disability. Functional status subsumes related concepts of interest, functional capacity, and functional performance. While functional capacity represents an individual's maximum capacity to perform the daily activities regarding the physical, psychological, social, and spiritual domains of life. Functional performance refers to the actual activities people do during the course of their daily lives **(Paul et al., 2022).**

Significance of the study:

Stroke is the leading cause of mortality and main cause of functional disabilities; victims with stroke cannot regain their normal life and their abilities before stroke. And 20% of survivors need institutional care after 3 months and 15% to30% become permanently disabled. Stroke is a life changing event that affects not only the person who may disabled, but the entire family and other caregivers **(Bakr et al, 2019)**

Aims of the study:

To explore the relation between data assessment and functional status of patients with stroke.

Research question.

Is there a relation between patients with stroke assessment data and their functional status?

Methods and Data Collection

Research design:

A descriptive research design was used to conduct this study.

Settings :

This study was carried out at Neurological department and outpatient clinic at Psychiatry, Brain and Neurosurgery Hospital at Assiut University.

Study Sample :

Eighty (80) adult patients diagnosed with Stroke were included in the study and have the following criteria: Age ranged from18 to 65 years old, from both gender, able and agree to participate in the study.

Sample Size:

Random sample included 80 adult male and female patients admitted to the neurological department at Assiut University Hospital. As there were about (1612) patients with stroke admitted to the Hospital during 2019, so for detecting patients sample size we using epi info program.

Sample size

The sample was selected by using the following equation according to **Steven Thompson (2012):**

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

- N=total patient population size of as there were about (1612) patients with stroke admitted to the Hospital during 2019.
- Z = confidence levels is 0.95 and is equal to 1.96
- D= The error ratio is = 0.05
- P= The property availability ratio and neutral = 0.5
- n=80 patients.

Tools for Data Collection:

To collect the relevant data for this study, three tools were used.

Tool (I): Patient Assessment Questionnaire.

This toll was developed by the researcher based on the national and international literature to assess risk factors leading to stroke and the medical history of patients.

It included two parts.

Part (1): Demographic Data;

This part includes items related to demographic data of the studied patients as (patient code, age, gender, diagnosis, work, income level, marital status, level of education, and body weight by kg).

Part (2): Medical Data; This part include;

- Patients past medical history of chronic disease such as (diabetes, hypertension, heart disease).
- The present medical history which include (type of stroke, the affected side (Rt/Lt) and previous stroke if any.
- Presence of hyperlipidemia, pulmonary problems, gastrointestinal problems, arthritis, family history of stroke, patients' habits (regarding diet, exercise, and /or smoking).

Tool (II): Modified National Institutes of Health Stroke Scale (MNIHSS);

This scale was developed by **Lyden et al., (1999),** to measure the effect of acute Stroke on a variety of areas including (level of conscious, visual, motor, sensory, and language).

Scoring system of the scale:

The highest is 42; greater than 16 score indicate strong probability to patient death, while a base line score less than 6 indicate a strong probability for recovery.

Tool (III): 12-Item Short Form Survey (SF-12);

It developed by **Ware et al., (1996)**, This tool is used to indicate the health status of a particular population whom have disability as stroke, SF12 measures eight domain; physical functioning (PF), physical role, bodily pain, general health, vitality, social functioning, emotional role and mental health.

Scoring system of SF12:

Scores range from 0 to100, with higher scores indicating better functioning of the physical and

mental health. A score of 50 or less on the PCS -12 has been recommended as a Cut-off to determine the physical condition; while a score of 42 or less on the MCS-12 may be indicative for clinical depression.

Ethical considerations:

- Research proposal was approved from the Ethical Committee of the faculty of nursing, Assiut University.
- There is no risk for studied subjects during application of the research.
- The study followed the common ethical principles in clinical research.
- Oral consent was obtained from patients who were willing to participate in the study after explaining the nature and purpose of the study.
- Confidentiality and anonymity were assured.
- Study subjects had the right to refuse to participate and or to withdraw from the study without any rational and at any time.
- Study subjects' privacy was considered during data collection.

Procedure

1. An official approval was obtained from the dean of the Faculty of Nursing to the head of the Neurological department soliciting the necessary approval to conduct the present research after explaining the nature of study to obtained their cooperation
2. An official approval for data collection was obtained from the responsible hospital authorities in Psychiatry, brain and neurosurgery Hospital.
3. **Tool validity:** The data collection tools were sent to panel of five experts in nursing science for face and content validity evaluation. The panel of five professors in the specialty nursing staff and medical fields at Assiut University. They reviewed the tools for relevance, clarity, and applicability. Some modifications were done depended on their opinions.
4. **Tool Reliability:** The reliability of the tools were done by Cronbach`s Alpha to assess the consistency and stability of the tools (0.922, 0.923, respectively).
5. **Pilot study:** A pilot study was carried out on 10% of nurses worked in previous mentioned setting to test the clarity, applicability of the questionnaire and to estimate the time need to fulfill sheet and the necessary modification was be done and the final form was developed, and these was be excluded from the total sample of the study.
6. Patient's agreement to voluntary participation was obtained after explaining the purpose and nature of the study.
7. Data were collected during after noon and night shifts, through face-to-face interviews. The researcher used the appropriate personal protective equipment (PPE) during data collection to avoid transmission of infection.
8. The tools were filled within 15-25 minutes depending on patient response to questions.
9. The collection of data lasted through the period from May 2022 to February 2023.
10. Demographic and medical data was obtained from patient using tool (I).
11. The researcher was assessing the functional status after stroke by using tools (II&III).
12. Each patient was interviewed to fill in the study tools and to assess functional status after stroke after explaining the aim and nature of the study.
13. The data collection occurred mainly in both morning and night shifts.
14. The number of patient differ from day to day depending on the number of patients suffered from stroke as ranged from 0 to 8 patient per day.

Statistical design

- An appropriate statistical methods &tests were used for analysis of the results.
- Data collected was analyzed &tabulated using frequency percentage &the suitable statistical testes.

Statistical analysis

Collected data was analyzed and tabulated. The researcher used an appropriate statistical analysis method and tests for analysis of the result. The statistical package for (SPSS) version (23) was used to analyze data. Descriptive statistics were used for the quantitative data. It included frequencies, percentage, mean ±SD person correlation (correlation is significant at the 0.05 level). The level of significant for this study was set at ($P<0.05$) to detect any indication of differences found in the data available.

Results:

Table (1): Demographic data of the studied patients (n=80)

Demographic data		N. (80)	%
Age group	18-<40	15	18.8
	40-<60	13	16.2
	60 and more	52	65.0
Mean ±SD		58.13 ± 16.01	
Sex	Male	33	41.2
	Female	47	58.8
Education	Illiterate	21	26.3
	Read and write	10	12.5
	Primary school	1	1.3
	Secondary school	37	46.3
	High education	11	13.6
Occupation	Office work	10	12.5
	Farmer	12	15.0
	Student	2	2.5
	Machinery work	5	6.3
	Non-working	28	35.0
	Other jobs	2	2.5
	Professional	1	1.2
	Retired	20	25.0
Marital status	Single	10	12.4
	Married	36	45.0
	Divorced	17	21.3
	Widow	17	21.3
Income	Low	24	30.0
	Medium	52	65.0
	High	4	5.0

Table (2): Distribution of medical data among the studied patients (N. =80)

Medical data of stroke patients		N. (80)	%
Past history	**No chronic disease**	7	8.8
	Diabetes	6	7.5
	HIN	7	8.8
	Previous stroke	2	2.5
	Family history with stroke	1	1.3
	Combined	57	71.1
Present history	**Type (ischemic)**	62	77.5
	Hemorrhage	18	22.5
Affected side	**Right**	19	23.8
	Left	61	76.2
Patient habits	**No special habits**	9	11.3
	Fatty diet	33	41.3
	Exercise	5	6.3
	Smoker	10	12.5
	Combined	23	28.6

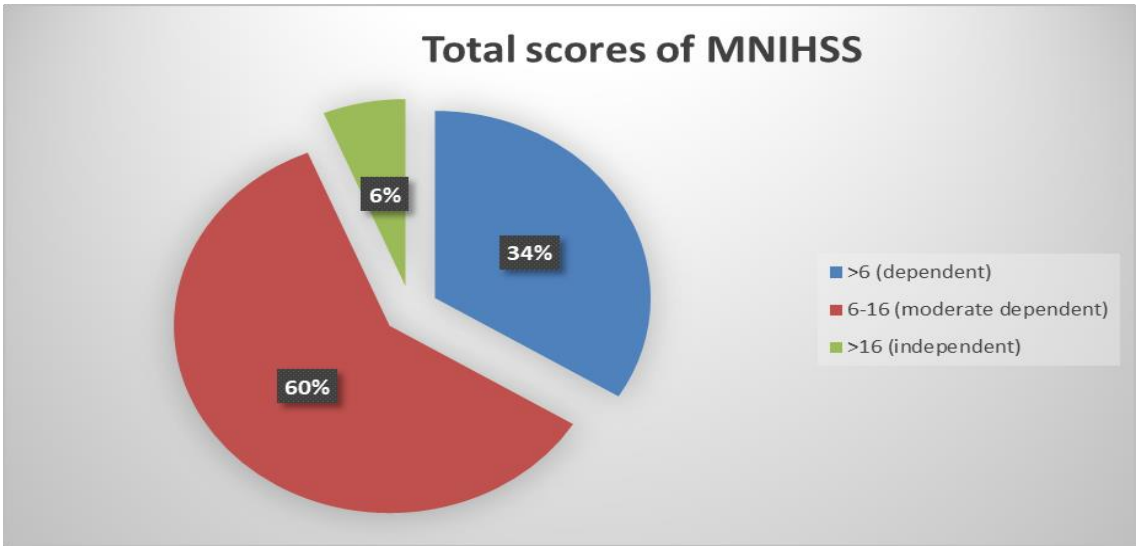

Fig (1): Distribution of the total mean of MNIHSS Scale items among the studied patients (N=80).

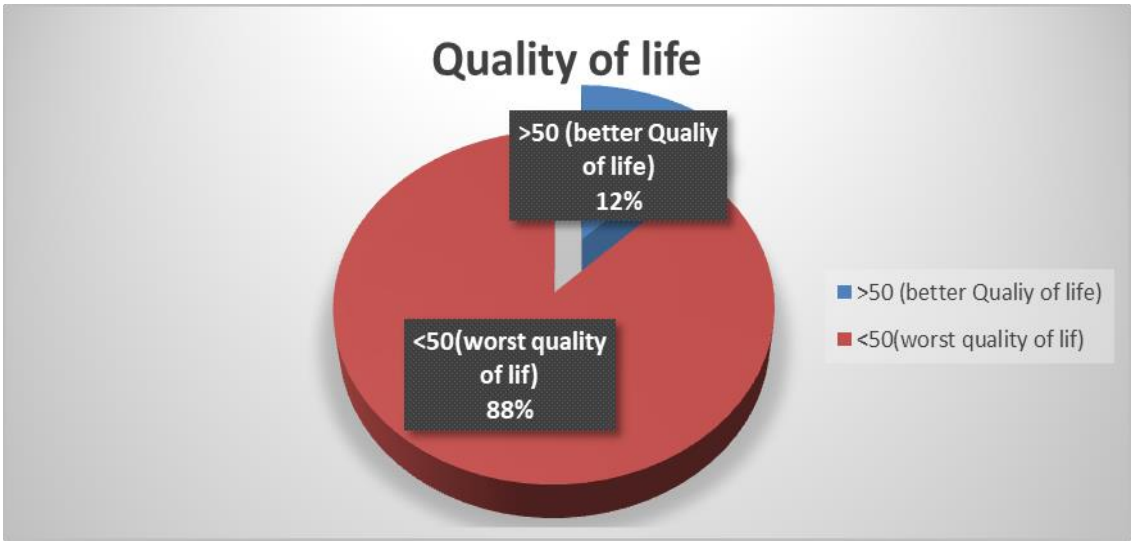

Fig (2): Distribution of the total score of quality of life among the studied patients (N=80).

Table (3): Relation between the total MNIHSS Scale and Short Form Survey score regarding the demographic data of the studied patients (N.=80)

Demographic data		Total MNIHSS scale			Short Form Survey-12		Total
		Dependent	Moderate dependent	Independent	Worst QOL	Better QOL	
Age group	**18-<40**	4(5%)	7(8.75%)	4(5%)	11(13.75%)	4(5%)	**0.005****
	40-<60	3(3.75%)	9(11.25%)	1(1.25%)	12(15%)	1(1.25%)	
	60 and more	20(25%)	32(40%)	0(0.0%)	50(62.5%)	2(2.5%)	
Sex	**Male**	12(15%)	18(22.5%)	3(3.75%)	30(37.5%)	2(2.5%)	**0.572**
	Female	15(18.75%)	30(37.5%)	2(2.5%)	40(50%)	7(8.75%)	
Education	**Illiterate**	7(8.75%)	14(17.5%)	0(0.0%)	14(17.5%)	7(8.75%)	**0.194**
	Read and write	2(2.5%)	8(10%)	0(0.0%)	9(11.25%)	1(1.25%)	
	Primary school	1(1.25%)	0(0.0%)	0(0.0%)	1(1.25%)	0(0.0%)	
	Secondary school	11(13.75%)	21(26.25%)	5(6.25%)	31(38.75%)	6(7.5%)	
	High education	6(7.5%)	5(6.25%)	0(0.0%)	8(10%)	1(1.25%)	

Demographic data		Total MNIHSS scale			Short Form Survey-12		Total
		Dependent	Moderate dependent	Independent	Worst QOL	Better QOL	
Occupation	**Office work**	4(5%)	4(5%)	2(2.5%)	8(10%)	2(2.5%)	**0.021****
	Farmer	3(3.75%)	9(11.25%)	0(0.0%)	12(15%)	0(0.0%)	
	Student	1(1.25%)	0(0.0%)	1(1.25%)	1(1.25%)	1(1.25%)	
	Machinery work	0(0.0%)	5(6.25%)	0(0.0%)	5(6.25%)	0(0.0%)	
	Non-working	9(11.25%)	18(22.5%)	1(1.25%)	22(27.5%)	6(7.5%)	
	Other Jobs	1(1.25%)	0(0.0%)	1(1.25%)	1(1.25%)	1(1.25%)	
	Professional	0(0.0%)	1(1.25%)	0(0.0%)	0(0.0%)	1(1.25%)	
	Retired	9(11.25%)	11(13.75%)	0(0.0%)	19(23.75%)	1(1.25%)	
Marital status	**Single**	4(5%)	5(6.25%)	1(1.25%)	9(11.25%)	1(1.25%)	**0.248**
	Married	12(15%)	20(25%)	4(5%)	34(42.5%)	4(5%)	
	Divorced	3(3.75%)	14(17.5%)	0(0.0%)	15(18.75%)	2(2.5%)	
	Widow	8(10%)	9(11.25%)	0(0.0%)	14((17.5%)	2(2.5%)	
Income	**Low**	9(11.25%)	13(16.25%)	1(1.25%)	22(27.5%)	1(1.25%)	**0.014**
	Medium	17(21.25%)	32(40%)	3(3.75%)	49(61.25%)	3(3.75%)	
	High	1(1.25%)	3(3.75%)	0(0.0%)	3(3.75%)	1(1.25%)	

Chi square *statistically significant (<0.05)*

Table (4): Relation between the total MNIHSS Scale and Short Form Survey-12 score with the studied patients' habits (N. =80)

Patients' habits	Total MNIHSS scale			QOL		P. value
	Dependent	Moderate dependent	Independent	Worst QOL	Beter QOL	
No special habits	3(3.75%)	6(7.5%)	0(0.0%)	8(10%)	1(1.25%)	
Fatty diet	10(12.5%)	20(25%)	3(3.75%)	30(37.5%)	3(3.75%)	
Exercises	2(2.5%)	3(3.75%)	0(0.0%)	4(5%)	1(1.25%)	**0.932**
Smoker	3(3.75%)	7(8.75%)	0(0.0%)	9(11.25%)	1(1.25%)	
Combined	9(11.25%)	12(15%)	2(2.5%)	21(26.25%)	2(2.5%)	

Chi square *statistically significant (<0.05)*

Table (1): Displayed that more than half of the studied patients (65.0%) among the 60 and more years old group, their mean age is 58.13 ± 16.01. Regarding studied patients' sex, more than half were females (58.8%). As well as around half of the studied patients attended secondary school (46.3%), one third of them were not working individuals (35.0%), while (45.0%) were married, and the majority were with medium income (65.0%).

Table (2): Displayed the medical data for the studied patients and should that the majority of the patients (71.25%) had a combination of chronic diseases, which may increase the risk of stroke. The most common chronic disease among the studied sample was hypertension (HIN), which affected 8.8% of patients. Previous stroke and family history of stroke were relatively rare among the studied sample (2.5% and 1.3%), respectively. Regarding the present history: Ischemic stroke was more common than hemorrhagic stroke among the studied sample, accounting (77.5% and 22.5% of cases) respectively. Left-sided stroke was more common than right-sided stroke, among the studied sample accounting for (76.2% and 23.8% of cases) respectively. Patient habits: A significant proportion of patients (41.3%) eat fatty diet. Smoking habit was present among 12.5% of the studied patients, only a small proportion of patients (6.3%) reported regular exercise.

Fig (1): Showed that the majority of the studied patients (60%) had moderate to severe stroke severity and also had a varying degree of impairment in different functional domains.

Fig (2): Showed that the majority of participants (87.5%) with a score of less than 50 on the SF-36 questionnaire (indicating worse health-related quality of life), while only 12.5% had a score of greater than 50 (indicating better health-related quality of life).

Table (3): This table showed that, regarding the stroke severity, the highest proportion of stroke patients (50%) had MNIHSS scores more than the 60 and there was no significant difference in health related QOL between the males and females' patients with (p=0.572). In terms of education, the highest proportion of patients with stroke had completed

secondary school (31%), followed by illiterate patients (14%) with no significant difference in health-related QOL between patients with different educational levels as (p=0.194). Regarding patients' occupation, the highest proportion of patients with stroke were among the non-working (22%), followed by farmers (12%) than the retired patients (19%). There was a significant difference between the health related QOL and studied patients' different occupations with (p=0.021). In terms of marital status, the highest proportion of patients with stroke were among the married (34%), followed by the widows (14%). There was no significant difference between the studied patients health-related QOL and their different marital status categories with (p=0.248). Regarding income, the highest proportion of patients with stroke had medium income (49%), followed by low income (22%) and the high income represented only (3%). Patients with low income had the highest proportion of worst QOL (59%), compared to patients with medium and high income, with significant difference between the health related QOL and their different income categories with (p=0.014).

Table (4): Should that there was no statistically significant difference between MNHISS QOL and patients' habits.

Discussion:

Stroke is a leading cause of disability and death worldwide, and the functional status of patients with stroke could vary widely depending on the severity of the stroke and other factors. To develop effective treatment and rehabilitation plans for patients with stroke, the healthcare professionals rely on patient assessment data to evaluate their functional status and predict the outcomes. The relation between patient assessment data and functional status for patients with stroke is complex and requires a comprehensive approach for patient care **(Gattellari et al., 2020).**

The study aimed to assess the relation between data assessment and functional status of patients with stroke. The present study found majority of the studied sample over sixty years old.

Regarding the study sample gender, most of them is female. In terms of education, the majority had completed secondary school followed by the illiterate group. Regarding occupation, the largest group was the non-working, followed by the farmers than the office workers group.

Regarding the studies patients marital status, the largest group was married, followed by divorced group than the widowed individuals and lastly the single individuals. In terms of income, the majority had medium income, followed by low income and high income.

These assessment data could provide valuable information for the healthcare professionals, to understand the characteristics of the population they are care. The high percentage of individuals over 60 years old may indicate a greater need for geriatric care or age-related health screenings. Similarly, the high percentage of non-working individuals may indicate the need for community-based programs to support employment and financial stability. Understanding the demographics characteristics of the population could help the healthcare professionals to tailor their plan of care to better meet the needs of their patients.

This is consistent with a study done by **NanZhu et al., (2019)** who present the fact that stroke is more common among older adults. This underscores the importance of geriatric care and specialized stroke services for older patients.

Regarding the finding of the current study female patients is more affected by stork than male, this finding consistent with the finding of a study done by **Ospel et al., (2022)** who reported that stroke is more common among women. This highlights the need of specific gender research and tailored treatment plans for patients with stroke.

Regarding education, the current study found that the majority of patients with stroke had completed secondary school or less (illiterate). This highlights the importance of clear communication from healthcare providers to ensure patients understand to their diagnosis, treatment plan, and prevention strategies. **Morrison et al., (2019)** reported that healthcare providers may need to consider patients' literacy level when providing written materials and instructions.

There had been several studies that investigated the relation between the educational level and health literacy, which is the ability to access, understand, and use health information to provide an informed decisions about one's health.

A study done by **Banbury et al., (2020)** and published in the Patient education and counseling 2020 found that individuals with lower levels of education were more likely to have limited health literacy, which could impact their ability to manage their chronic conditions like stroke and hypertension.

Another study done by **Bardhan et al., (2020)** found that patients with limited health literacy were less likely to understand their medication instructions and more likely to have medication errors.

Similarly, a study done by **Svendsen et al., (2020)** who found that low health literacy associated with poorer health outcomes, including higher rates of hospitalization and mortality.

These studies highlight the importance of clear communication and health literacy in healthcare. Healthcare providers should be aware about patients' educational level and literacy when providing information about their diagnosis and treatment plan.

The researcher perspective that nurses may need to use plain language, visual aids, and other strategies to ensure that patients understand the information being presented to them. Additionally, in a study done by **Aaby et al., (2020)** who reported that healthcare organizations could invest in health literacy training for their staff and develop materials that are accessible to patients with varying levels of education and literacy.

The present study found that the high percentage of non-working individuals among the sample could also suggest the need for community-based programs to support employment of patients with stroke and their financial stability. Also in a study done by **Prynn & Kuper, (2019)** who reported that stroke could impact an individual's ability to work, which could also lead to financial strain and barriers to accessing healthcare services.

The present study found that the high percentage of non-working individuals could also suggest the need for community-based programs to support employment and financial stability of such group of patients. Neurologic disorders could impact an individual's ability to work, which could also lead to financial strain and barriers to accessing healthcare services **(Morris et al., 2021).**

In a study done by Liu et al., (2023) who reported that individuals with stroke faced significant barriers to employment, including discrimination and lack of accommodations in the workplace and suggests that vocational rehabilitation programs may help individuals with stroke to overcome these barriers and maintain employment.

According to the researcher opinion this study highlight the importance of addressing employment and financial stability for individuals with neurologic disorders.

Based on other studies which had reported more positive outcomes, for example, a study published by **Radford et al., (2020)** in the Journal of Occupational Rehabilitation in 2020, who found that individuals with stroke who participated in rehabilitation program their employment outcomes had improved, which including increased work participation and hours worked.

Regarding the medical and family history:

The present study found that the majority of patients had a combination of chronic diseases, which may increase the risk of stroke. The most common chronic disease among the study sample was hypertension (HIN), which was present in about nine percentage of patients. Previous stroke and family history of stroke were relatively rare.

There were a few studies supported those chronic diseases, specifically hypertension, are a significant risk factor for stroke. In a study done by **Fekadu et al., (2019)** published in BMC neurology in 2019, they found that hypertension was the most common risk factor for stroke among a large international sample of this study which collected data from 22 countries and over 26,000 patients with stroke. Another study done by **Li et al., (2022)** who reported that hypertension was the most important modifiable risk factor for stroke, and that blood pressure control is critical in reducing stroke risk among a sample of over 1,500 patients from a Chinese hospital.

However, it is important to note that research findings could sometimes differ based on the study population, methodology, and other factors. Therefore, the researcher opinion is important for healthcare providers to identify and manage chronic diseases like hypertension in order to reduce the risk of stroke and improve patient outcomes.

In the other hand, in a study done by **O'Donnell et al., (2021)** who reported that while hypertension was a strong risk factor for stroke, the relation between blood pressure and stroke risk may be more complex than previously thought.

In a study done by Sheppard et al., (2021) who suggested that the optimal blood pressure for reducing stroke risk may depend on some factors such as age and comorbidities. Another study done by **Zhong et al., (2022)** who found that while hypertension is a significant risk factor for stroke, the majority of stroke cases occur in individuals without hypertension and suggested another risk factors, such as smoking, diabetes, and obesity, which may play a larger role in stroke risk more than previously thought.

Also in a study done by Kelly & Rothwell, (2019) who reported that the mechanisms by which hypertension increases stroke risk are not fully understood and suggested that further research is needed to better understand the relation between hypertension and stroke.

While in a study done by **Psara et al., (2020)** who suggested that hypertension may not be the sole cause of stroke or that the relation–between blood pressure and stroke risk may be more complex than previously thought, it is important to note that hypertension is still widely recognized as a significant risk factor for stroke.

Regarding the present history:

The current study found that Ischemic stroke was more common than hemorrhagic stroke. Also, ischemic stroke was more common than hemorrhagic

stroke among a large population-based on the finding of a study done by **Toyoda et al., (2022)** who included data from over 1.3 million patients with stroke.

Another study done by **Lang et al., (2019)** and published in the Frontiers in neurology journal in 2019, who found that ischemic stroke was more common than hemorrhagic stroke among a population-based study in Finland included data from over 3,000 patients with stroke.

These studies suggested that ischemic stroke is more common than hemorrhagic stroke in various populations and geographic regions, the reasons for this may include differences in risk factors, such as hypertension, and differences in the underlying pathophysiology of the two types of stroke.

In the other hand, in a study done by **El-Gohary et al., (2019),** who found that hemorrhagic stroke was more common than ischemic stroke in a hospital-based study at Saudi Arabia. The study included data from over 400 patients with stroke. Otherwise, in a study done by **Tu et al., (2022), who** found that the incidence of hemorrhagic stroke was higher than the incidence of ischemic stroke in a specific region of China. The study included data from over 2.5 million people. The reasons for this may include differences in risk factors, such as hypertension, smoking, and differences in the underlying pathophysiology of the two types of stroke.

However, healthcare providers should be aware about the potential effect of the regional or population-based variations in stroke incidence and consider these factors when perform the diagnostic and treatment decisions. It is important to continue conducting research for better understanding of the epidemiology and pathophysiology of the ischemic and hemorrhagic stroke in order to improve prevention and treatment strategies.

Regarding the affected side: the present study found that left-sided stroke was more common than right-sided stroke.

The finding that left-sided stroke is more common than right-sided stroke has been reported in several studies. There are several reasons why this may be the case.

Firstly, it supported by the finding of study done by **Radford et al., (2020)** who mentioned that the left hemisphere of the brain is responsible for language and communication, while the right hemisphere is responsible about the spatial awareness and visual processing. Therefore, damage to the left hemisphere is more likely to result in language and communication deficits, which are often observed among patients with left-sided stroke.

Secondly, as mentioned in a study done by **Mahgoub et al., (2023),** who reported that distribution of blood vessels in the brain, may contribute to the higher incidence of left-sided stroke. The left middle cerebral artery, which supplies blood to much of the left hemisphere, is larger and more dominant in the majority of people, compared to the right middle cerebral artery. This may make the left hemisphere more vulnerable to ischemic events, such as blood clots or blockages (**Toyoda et al., 2022).**

The researcher view that understanding the relative frequency of left-sided and right-sided stroke could help healthcare providers tailor their diagnostic and treatment approaches to be best meet the needs of their patients. For example, patients with left-sided stroke may require more intensive rehabilitation focused on language and communication skills, while patients with right-sided stroke may require more rehabilitation focused on spatial awareness and visual processing skills.

Regarding patient habits:

The present study reported that a significant proportion of patients like the fatty diet, which may contribute to the development of cardiovascular disease and stroke. Less than one quarter was smoker which is a known risk factor for stroke. Only a small proportion of the studied patients reported regular exercise.

Overall, the data presented in the present study highlights the importance of addressing risk factors and lifestyle habits that contribute to the development of stroke. Healthcare providers should work with their patients to identify and manage their chronic diseases, promote healthy eating habits, and encourage regular physical activity. Additionally, in a study done by **Gritz et al., (2020),** who revealed that habits of patients with stroke could help healthcare providers to tailor their plan of care to better meet the needs of such population group.

Regarding MNHISS scale:

The present study, revealed that more than half of patients were moderate dependence. The results also suggest that patients had varying degrees of impairment in different functional domains. For example, while the majority of patients had normal sensory function, over one third had abnormal sensory function. Similarly, while the majority of patients had normal language function, and more than half had some degree of aphasia.

The results suggest that the majority of patients in this sample had moderate to severe stroke severity and that patients had varying degrees of impairment in different functional domains. This highlights the importance of individualized care and rehabilitation plans that address the specific needs of each patient. Overall, the MNIHSS results provide valuable information for healthcare providers to assess stroke

severity, plan treatment and rehabilitation, and predict patient outcomes **(Hybbinette et al., 2021).**

In a study done by **Pedersen et al., (2021)** who revealed that patients with stroke often had a range of physical, cognitive, and emotional impairments that could impact their recovery and quality of life. Another study done and published by **Stolwyk et al., (2021)** who reported that patients with stroke often have impairments in multiple functional domains, including motor function, balance, cognitive function, and mood.

While in a study done by **Gandolfi et al., (2021)** who found that patients with stroke often experience a range of physical, cognitive, and emotional impairments that could impact their recovery and quality of life.

These finding supported by **Pan et al., (2019)** study, who suggested that patients with stroke often had a varying degrees of impairment in different functional domains, which highlights the importance of individualized care and rehabilitation plans that address the specific needs of each patient.

In the opposite side**,** in study done by **Dombovy & Sandok (2019**) who found mild impairment in the functional status of the patients with stroke. This may be due to early management received to those patients.

While these studies may had different focuses or methodologies, as they all supported the general finding that patients with stroke often had impairments in multiple functional domains.

Regarding SF-12 degree:

The present study found that the majority of participants had scores below 50 on the SF-12 questionnaire, indicating worse health-related quality of life, while in study done by **Xu et al., (2023)** who reported that the majority had scores above 50, indicating better health-related quality of life. This highlights the importance of assessing health-related quality of life among patients with various health conditions using validated tools such as the SF-36 questionnaire and developing an intervention based on their needs to improve health outcomes and quality of life among such group of patients.

The present study found a significant statistically difference between mNIHSS score and QOL score with patients' ages, occupation and their income. Overall, the results of the present study suggest that patients with stroke, particularly those who are older, developed more severe stroke and lower health related QOL, and are more likely to be dependent on others for their daily activities. Additionally, patients with certain occupations, such as office workers, may have better health related QOL compared to patients in other occupations. The finding also suggest that patients with lower income are more likely to have worse health-related QOL compared to patients with higher income. However, it is important to note that the interpretation of the results should take into account the specific research question or hypothesis being examined, as well as the characteristics of the study population.

In this line, **Ghoneem et al., (2022)** perform a study examined the relation-between socioeconomic status (SES) and stroke outcomes among a large sample of patients with stroke and found that patients with lower SES had worse functional outcomes, longer hospital stays, and higher mortality rates compared to patients with higher SES.

Another study done by **Jones et al., (2021)** who examined the relation-between race/ethnicity and post-stroke functional outcomes in a diverse sample of patients with stroke and found that their studied patients had worse functional outcomes compared to non-Hispanic white patients, even after adjusting the demographic and clinical factors.

Regarding the relation between age and stroke outcomes, **Radford et al., (2020)** examined in their study the association between age and functional outcomes among patients with stroke, they found that older age was associated with worse functional outcomes, longer hospital stays, and higher mortality rates among patients with stroke.

Regarding the relation between occupation and stroke outcomes, a study published by **Redmond et al., (2022)** who examined the impact of occupational therapy on the functional outcomes of patients with stroke, also, the study found that patients who received occupational therapy had better functional outcomes compared to those who did not receive such therapy.

Regarding the relation between income and stroke outcomes, a study published found that patients with lower income had higher mortality rates compared to patients with higher income.

Overall, the researcher views that these studies suggest that demographics characteristics of patients with stroke could significantly influence their health outcomes, including functional outcomes, quality of life, and mortality rates. However, further research is needed to fully understand the complex relation between those variables and stroke outcomes.

In the other hand, in a study done by **Butsing et al., (2019),** who found that patients with higher education levels had better functional outcomes and QOL scores compared to patients with lower education levels.

Additionally, in a study done by **Ko et al., (2020)** who found that patients with lower income levels had worse functional outcomes and QOL scores compared to patients with higher income levels.

In this line**,** in a study done by **Wnuk et al., (2022)** and published, in which they examined the relation

between smoking and stroke outcomes among a large sample of patients with stroke and found that patients who smoked had worse functional outcomes and higher mortality rates compared to non-smoking patients.

Another study of Steen done by **Krawcyk et al., (2019)** who assess the impact of physical activity on stroke outcomes among a diverse sample of patients with stroke and found that patients who engaged in regular physical activity had better functional outcomes and lower mortality rates compared to patients who were physically inactive.

Regarding the relation between diet and stroke outcomes, a study done by **Tsang et al., (2021)** who found that patients who adhered to a healthy diet had better functional outcomes and lower mortality rates compared to patients who did not adhere to a healthy diet.

Overall, these studies suggest that certain lifestyle factors, such as smoking, physical activity, and diet, could significantly influence the risk of stroke and stroke outcomes. However, in a study done by **Novbakht et al., (2020)** who reported that no statistically significant difference was found between the habits of patients with stroke and their mNIHSS scores and QOL scores. It is important to note that the relation between habits and stroke outcomes is complex and may depend on various factors, such as the type and severity of the stroke, the patient's overall health status, and other demographic characteristics.

In any case, it is important for patients with stroke to adopt healthy lifestyle habits, such as quitting smoking, engaging in regular physical activity, and maintaining a healthy diet, in order to minimize their risk of stroke and improve their health outcomes. Patients with stroke may also benefit from working with healthcare professionals, such as rehabilitation specialists and nutritionists, to develop a personalized plan for improving their habits and managing their stroke recovery.

Conclusion:

Among the current study subjects more than half over 60 years old, females, attended secondary school, non-working individuals, married and with medium income. Also, the majority of patients had a combination of chronic diseases (hypertension). Ischemic stroke was more common than hemorrhagic stroke which affected the left-side. A significant proportion among studies patients like the fatty diet and smokers. The majority of patients had moderate to severe stroke severity and such group of patients had varying degrees of impairment in different functional domain with a score of less than 50 on the SF-36 questionnaire (indicating worse health-related quality of life). There was no significant difference between both health related QOL and the total level of MNIHSS Scale with males and females, different educational levels with (p=0.194), marital status categories and patients' habits. While there was a significant difference between both health-related QOL and MNIHSS Scale total scores with age, different occupations and their income with (p=0.021).

Recommendations:

1. Encourage patients to adopt a healthy lifestyle which includes eating a balanced diet, exercising regularly, and quitting smoking.
2. Manage chronic diseases through regular monitoring, medication, and lifestyle changes.
3. Provide rehabilitation therapy to help patients recover and improve their functional abilities.
4. Consider the impact of occupation and income on patients' health-related quality of life and adjust treatment plans accordingly.
5. Focus on improving health-related quality of life through appropriate treatment and rehabilitation plans includes addressing physical, emotional, and social aspects of health.

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