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# Stroke Knowledge and Health Anxiety among Stroke Patients in A Rehabilitation Clinic, Tertiary Hospital

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## ABSTRACT

**Background:** Stroke generally results in life-altering changes, and the significance of stroke knowledge and health anxiety has become a global priority. **Aim:** This study aims to determine the level of stroke knowledge and health anxiety among stroke patients in the rehabilitation clinic at the University Malaya Medical Centre and to determine the association of stroke knowledge and health anxiety with socio-demographic data. **Methods:** This study employed cross-sectional surveys conducted using a convenience sampling technique. The data was gathered from April to October 2021, and approximately 150 stroke patients were required to respond to a set of validated questionnaires (the Stroke Knowledge Test and the Health Anxiety). The data were analyzed with descriptive and inferential statistics. **Results:** The finding shows that on average, the age of respondents was 51 years (SD=13.12), and the majority of them were male (n=83, 55.3%), married (n=130, 86.7%), had a secondary level of education (n=81, 54.0%) and categorized under B40 (n=89, 59.3%). Most of them reported having good stroke knowledge (n=103, 68.7%), and experienced anxiety (mean=29.96, SD=8.72). There was no association between stroke knowledge and socio-demographic data ($p > 0.05$). For the health anxiety, age, marital status, and education level were found to be associated with the anxiety ($p<0.05$). Those who aged less than 30 years experienced more anxiety as compared to the seniors' group (r=-0.607, $p<0.001$). Furthermore, married respondents showed lower levels of anxiety than single respondents [$t(148) = 0.266$, $p = 0.009$]. Patients who had a high level of education were more anxious than those who had a primary level of education [$F(2,147) = 16.03$, $p<0.001$]. **Conclusion:** The organizations should provide ongoing awareness and psychological support to promote the patients and their family members. Nurses, who spend the most time with patients, are expected to reinforce the stroke education program and communicate with the patient's family to minimize their anxiety level.

*Keywords: Anxiety; Knowledge; Stroke; Patient(s)*

## INTRODUCTION

A stroke, also known as a brain attack, happens when a blood vessel in the brain bursts or when something blocks the flow of blood to a specific area of the brain (Centers for Disease Control and Prevention [CDC], 2022). A stroke is classified as a transient ischaemic attack (TIA), an ischemic stroke, or a hemorrhagic stroke. Some symptoms may last for more than 24 hours and result in death. As reported by Mohammed *et al.* (2020), stroke is one of the top five leading causes of death and disease in Malaysia.

According to Soto-Cámara *et al.* (2020), stroke treatment is a continuous process in which time is the most important and critical component that affects therapies delivered to acute stroke patients and decides their

eventual outcome. Ignorance of stroke symptoms, limited infrastructure, and institutional hesitation can increase the burden of stroke and worsen patients' conditions. Delaying treatment may decrease the prognosis due to late hospitalization and the risk of morbidity. People who see stroke symptoms should call emergency medical services (EMS) immediately (Wilhelm *et al.*, 2020).

Stroke has become the most prevalent cause of dependence on others for daily tasks, causing impairments. These circumstances can lead to caregiver burden and stress. Mood disorders are common, and their detection and treatment have significant public health benefits. Poststroke depression (PSD) lengthens hospital stays, hinders function, and elevates the risk of suicide. PSD is associated with increased mortality and may be a risk factor for stroke (Broomfield *et al.*, 2014). Community education awareness on stroke may be required to expedite the presentation and referral of stroke patients. In Malaysia, stroke support groups have become a big part of getting the word out about programmes that teach people about strokes (Tan & Venkatesubramanian, 2022).

Rafsten, Danielsson, and Sunnerhagen (2018) reported that stroke patients may have physiological and mental abnormalities such as mood issues, which may impede rehabilitation and long-term recovery. Chun *et al*. (2018) discovered that anxiety affects around a quarter of stroke patients and one-third of TIA patients. According to Xiao *et al*. (2020), post-stroke depression (PSD), anxiety, emotional incontinence, wrath-proneness, and fatigue are common symptoms. Based on a study by Knapp *et al*. (2017), stroke and anxiety are public health concerns. Post-stroke anxiety is more common in younger or female patients since they are unable to work, which reduces their income if they come from low-income households. Various things affect how stroke survivors cope, like mental health issues, support from others, belief in oneself, after-effects of the stroke, spiritual beliefs, how severe the stroke was, practical matters, reliance on others, rehabilitation, treatment, gender, not having enough information, and how the person sees the illness (Rohmah *et al.*, 2023). As Wright *et al.* (2017) claimed, one-third of post-stroke patients have mental health issues, which may increase morbidity and mortality. This study investigates stroke knowledge and health anxiety among stroke patients on warning signals and risk factors, as well as the relationship between this information and health anxiety with socio-demographic data.

## METHODOLOGY

### Study Design, Study Setting, and Target Population

The research design used was a quantitative and cross-sectional study. The study was conducted in the Rehabilitation Unit at the University Malaya Medical Center (UMMC). The target population of this study is stroke patients attending the Rehabilitation Unit at UMMC. The participants were provided adequate information and could give consent to allow for a reasoned decision. Besides, the participant's information was kept anonymous, and the sources cannot be identified. Data was collected between April 2021 and October 2021. The participant answered the questionnaires within 30 minutes. After the procedures, all consents and answers were collected and stored for data analysis.

### Sample Size Calculation, Inclusion and Exclusion Criteria and Sampling Technique

The sample size was estimated using Raosoft (2004), and 150 participants were deemed appropriate according to the "rule of thumb" with a 5% margin of error, a 95% confidence interval (CI), and a 50% response distribution.

The inclusion criteria include patients newly diagnosed with stroke within the last three months, patients aged 21 and older, and patients referred to the clinic for post-stroke rehabilitation by a physician. Individuals diagnosed with stroke and other neurological disorders (epilepsy, intracranial haemorrhage, and serious head trauma) were excluded as patients with substantially compromised cognitive and communicative abilities. A non-probability convenience sampling technique was used, and those respondents who met all eligibility criteria were invited to participate in the study through a self-administered questionnaire.

**Instrumentations and Pilot Study**

The set of instruments is divided into three parts. Part A is socio-demographic data, which has five items. This part includes gender, marital status, age, education, and basic income.

Part B is the Malay version of the Stroke Knowledge Test questionnaires, which come with multiple-choice questions used to evaluate patients' knowledge regarding stroke (Sowtali *et al*., 2016). The 20 questions were constructed in a five-alternative option that consisted of one correct answer, three distracters, and one "I don't know" option for the participant to choose from. This part consists of Multiple-Choice Question (MCQ), in which the respondent needs to choose one suitable answer. Each correct answer was given one (1) mark, and a wrong answer was given a no (0) mark. Possible scores ranged from 0 to 20. A higher score indicates good knowledge, and a lower score indicates poor knowledge regarding stroke. The answer from the respondent will determine the level of knowledge based on the choice of the answer. As mentioned by Sowtali *et al*. (2016), the cut-off point for a decent knowledge level was 50% of the 20 items. The tool was reported to be reliable, with a Kuder Richardson score of 0.58.

Part C is a questionnaire regarding the health anxiety inventory (HAI) (Salkovskis *et al*., 2002). This part includes 18 statements consisting of A, B, C, and D used to evaluate patients' health anxiety post-stroke. The 18 questions were constructed with four chosen answers, and there are two sections in Part C, which are statements number one to number fourteen explaining the respondent's feelings over the past six months. In contrast, statements fifteen to eighteen explained respondents' negative feelings if they had any serious illness. There is no right or wrong in answering Part C. Each item is scored on a scale from 0-3 (for example, b=1, c=2, d=3). If multiple items are endorsed, then get the highest score. The total score represents the sum of all the scores. The results of internal consistency (alpha coefficient) for the HAI were excellent (0.95) (Salkovskis *et al*., 2002).

A pilot study was done with 30 samples before the actual study from April 1$^{st}$ to April 15$^{th}$, 2021. The findings show the internal consistency for both scales was acceptable (ranging from 6.5 to 8.0). Respondents involved in the pilot study were excluded from the real study.

**Data Analysis**

The collected data were analyzed using the statistical package for the social sciences (SPSS) version 26.0. Descriptive and inferential statistics such as the Chi-square test and the Fisher Exact test were used for the analysis. Other than that, the independent t-test and ANOVA test were also used to compare means between groups. A $p$-value of less than 0.05 was considered significant.

**Ethical Consideration**

The present study received ethical approval from the UiTM Research Ethics Committee, Selangor, Puncak Alam Campus, Malaysia with reference number REC/03/2021(UG/MR/218) dated 31$^{st}$ March 2021) and the Director of University Malaya Medical Centre, Malaysia with reference number MREC ID NO: 202119-9691 dated 7$^{th}$ March 2021, before the commencement of the study.

**RESULTS**

**Distribution of Socio-Demographic Data among Stroke Patients in A Rehabilitation Clinic, University Malaya Medical Center**

The study involved 150 individuals in total. The statistics show that the average age of all participants was 51.42 (SD=±13.12) years. The majority of respondents were between the ages of 31 and 59 (n = 101, 67.3%). Half of the patients at the Rehabilitation Clinic at the University Malaya Medical Centre were male (n=83, 55.33%) and 130 (86.7%) were married. For the educational level, 81 (54%) of them attended secondary school, and the majority of them were from the B40 category (RM3500) (n=89, 59.3%) with an average monthly income of RM 3503.00 (SD=±994.80) (Table 1).

*Table 1: Socio-Demographic Data of Respondents (N=150)*

| Variables | Mean | ± SD | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| **Age (year) Mean ± SD** | 51.42 | 13.12 | | |
| <30 | | | 6 | 4 % |
| 31-59 | | | 101 | 67.3 % |
| >60 | | | 43 | 28.7 % |
| **Gender** | | | | |
| Male | | | 83 | 55.33 % |
| Female | | | 67 | 44.67 % |
| **Marital Status** | | | | |
| Single | | | 20 | 13.3 % |
| Marriage | | | 130 | 86.7 % |
| **Basic Education** | | | | |
| Primary | | | 29 | 19.3 % |
| Secondary | | | 81 | 54.0 % |
| Tertiary | | | 40 | 26.7 % |
| **Range of Income** | 3403.00 | 994.8 | | |
| B40 (<RM3500) | | | 89 | 59.3 % |
| M40 & T20 (RM3501-RM8500) | | | 61 | 40.7 % |

**Knowledge Level and The Distribution of Items Regarding Stroke among Stoke Patients in a Rehabilitation Clinic, University Malaya Medical Center**

As stated by Sowtali *et al*. (2016), the knowledge level is divided into good and poor knowledge. Table 2 shows the total level of knowledge score, with 103 (68.7%) respondents having a high knowledge of stroke and 47 (31.3%) having poor knowledge.

*Table 2: Level of Stroke Knowledge among Stroke Patients (N=150)*

| Level of Stroke Knowledge | n | % |
|---|---|---|
| Good score (score 50% and above) | 103 | 68.7% |
| Poor score (score 49% and less) | 47 | 31.3% |

Table 3 illustrates the distribution of responses depending on participant responses. Item 7 had the most accurate answers, with 150 participants correct (100%). Furthermore, question 20 has the second-highest score, with 148 participants correctly answering it (98.7%). Meanwhile, the question with the fewest right answers was Item 14 and Item 18 Smoking 20, with all wrong answers (100%).

*Table 3: Distribution of Items Responses Related to Stroke Knowledge (N=150)*

| No | Item | N, (%) Correct Answer | N, (%) Incorrect Answer |
|---|---|---|---|
| 1. | The most *common* type of stroke occurs when | 85 (56.7) | 65 (43.3) |
| | A. The blood supply to the brain is blocked | | |
| 2. | Which of the following will double your risk of stroke? | 85 (56.7) | 65 (43.3) |
| | B. If you are diabetic | | |
| 3. | A type of irregular heartbeat known as Atrial Fibrillation (AF) | 10 (6.7) | 140 (93.3) |
| | C. Increases the risk of stroke by more than 5 times | | |
| 4. | Which age group is more at risk of stroke? | 11 (7.3) | 139 (92.7) |
| | D. More than 61 years old | | |
| 5. | The warning signs of Transient Ischaemic Attack (TIA) disappear | 91 (60.7) | 59 (39.3) |
| | A. Within 24 hours | | |

| 6. | Which of the following is a warning sign of stroke? | 37 (24.7) | 113 (75.3) |
|---|---|---|---|
| | D. All the above | | |
| 7. | For someone who has had a stroke, the main purpose of rehabilitation is to | 150 (100) | 0 (0.0) |
| | C. Improve their level of daily functioning | | |
| 8. | Taking aspirin assists in preventing stroke by | 84 (56.0) | 66 (44.0) |
| | A. Stopping the formation of blood clots | | |
| 9. | You are at greater risk of stroke if | 141 (94.0) | 9 (6.0) |
| | A. You are obese | | |
| 10. | Once you have suffered a Transient Ischemic Attack (TIA) | 108 (72.0) | 42 (28.0) |
| | B. You are more likely to have a major stroke | | |
| 11. | Surgery can sometimes help to prevent another stroke by | 30 (20.0) | 120 (80.0) |
| | C. Unblocking the arteries in the neck | | |
| 12. | What method of treatment is available for people who have had a stroke? | 69 (46.0) | 81(54.0) |
| | D. All the above | | |
| 13. | The most important known risk factor for stroke is | 99 (66.0) | 51 (34.0) |
| | C. High blood pressure | | |
| 14 | Approximately how many Malaysians are affected by stroke every year? | 0 (0.0) | 150 (100) |
| | D. 50000 | | |
| 15. | If you drink alcohol excessively you are | 139 (92.7) | 11 (7.3) |
| | B. Twice as likely to suffer stroke | | |
| 16. | Which of the following is an example of a *physical* disability caused by stroke? | 75 (50.0) | 75 (50.0) |
| | A. The right arm is paralysed | | |
| 17. | To reduce the risk of stroke you need to | 47 (31.3) | 103 (68.7) |
| | D. All the above | | |
| 18. | Smoking 20 cigarettes per day increases the risk of stroke by | 0 (0.0) | 150 (100) |
| | C. 6 times | | |
| 19. | If someone has a stroke, when should you ring for an ambulance? | 113 (75.3) | 37 (24.7) |
| | B. Always ring for an ambulance straight away | | |
| 20. | Rehabilitation can assist someone who has suffered | 148 (98.7) | 2 (1.3) |
| | D. All the above | | |

**The Score of Health Anxiety among Stoke Patients in A Rehabilitation Clinic, University Malaya Medical Center**

The distribution of response patients for each item under the anxiety factor among stroke patients is shown in Table 4. The mean of the total scores from items 1 to 18 was 29.96 (SD=8.72). The total scores for "fear of illness" and "negative consequences of an illness" were 23.36±7.14 and 5.06±2.20 respectively, indicating the respondents are in anxiety.

The item with the highest score in the "fear of illness" category was Item 11 (mean= 2.43, SD=0.798). Meanwhile, the highest score of items for the "negative repercussions of an illness" domain was Item 17 (mean= 1.37, SD=0.572) (Table 4).

*Table 4: The Score of Health Anxiety among Stroke Patients for Each Item (n=150)*

| Item | | Mean | ±SD | Min | Max |
|---|---|---|---|---|---|
| **Fear of Illness** | | | | | |
| 1. | Health concern | 2.13 | 0.762 | 1 | 3 |
| 2. | Perception of pains in comparison to people of the same age | 1.50 | 0.502 | 1 | 2 |
| 3. | Awareness of changes or bodily sensations | 1.53 | 0.642 | 1 | 3 |
| 4. | Ability to resist disease concerns | 2.05 | 0.881 | 0 | 3 |
| 5. | Fear of having an illness | 2.03 | 1.023 | 0 | 3 |
| 6. | Imagine being sick | 1.86 | 0.875 | 1 | 3 |
| 7. | Ability to control the thoughts on health | 1.69 | 0.465 | 1 | 2 |
| 8. | Relief when the doctor reported negative results in a test | 1.63 | 1.178 | 0 | 3 |

| 9. | Hear about an illness makes me think I can have it | 1.49 | 0.896 | 0 | 3 |
|---|---|---|---|---|---|
| 10. | If I have bodily sensations, I wonder what may be | 1.63 | 0.525 | 1 | 3 |
| 11. | Perceived risk of getting a disease | 2.43 | 0.798 | 1 | 3 |
| 12. | Belief of having a serious illness | 1.73 | 0.817 | 0 | 3 |
| 13. | Ability to think of something else when I feel bodily sensations | 1.65 | 0.657 | 1 | 3 |
| 14. | Perception of familiars and friends on your health concerns | 1.54 | 0.500 | 1 | 2 |
| | **Total Mean Score (Fear of Illness)** | **23.36** | **7.140** | **8** | **31** |
| **Negative Consequences of an Illness** | | | | | |
| 15. | Ability to enjoy life if I had a disease | 1.35 | 0.714 | 0 | 2 |
| 16. | The probability of cure if I had a serious illness | 1.06 | 0.869 | 0 | 2 |
| 17. | A serious illness could affect many aspects of my life | 1.37 | 0.572 | 0 | 3 |
| 18. | Loss of dignity for contracting a disease | 1.16 | 0.725 | 0 | 2 |
| | **Total mean score (Negative Consequences of anIllness)** | **5.06** | **2.202** | **1** | **8** |
| **Total Mean Score (Item 1-18)** | | **29.96** | **8.722** | **14** | **41** |

## The Association between Level of Stroke Knowledge and Socio-Demographic Data among Stroke Patients in a Rehabilitation Clinic, University Malaya Medical Centre

This study found that the stroke knowledge level was not significantly associated to socio-demographic data ($p > 0.05$) (Table 5).

*Table 5: The Association between Level of Stroke Knowledge and Socio-Demographic Data (n=150)*

| Variable | Poor knowledge n(%) | Good knowledge n(%) | Chi square $\chi^2$ (df) | *p*-Value |
|---|---|---|---|---|
| **Age[b]** | | | 5.563 (2) | 0.062 |
| <30 | 0.0 ( 0.0%) | 6 (4%) | | |
| 31-59 | 48 (32%) | 53 (35.3%) | | |
| >60 | 17 (11.3%) | 26 (17.3%) | | |
| **Gender[a]** | | | 0.103 (1) | 0.749 |
| Male | 35 (23.3) | 48 (32.0) | | |
| Female | 30 (20.0) | 37 (24.7) | | |
| **Marital Status[a]** | | | 0.65 (1) | 0.419 |
| Single | 7 (4.7) | 13 (8.7) | | |
| Marriage | 58 (38.7) | 72 (48.0) | | |
| **Education Level** | | | 3.05 (2) | 0.218 |
| Primary | 11 (7.3) | 18 (12.0) | | |
| Secondary | 32 (21.3) | 49 (32.7) | | |
| Tertiary | 22 (14.7) | 18 (12.0) | | |
| **Basic Income[a]** | | | 0.276 (1) | 0.599 |
| B40 (<RM3500) | 37 (24.7%) | 52 (34.6%) | | |
| M40 & T20 (RM3501) | 28 (18.6%) | 33 (22%) | | |

*Note; aChi-square test, bFisher's exact*

## The Relationship Between Health Anxiety Score and Socio-Demographic Data Among Stroke Patients in A Rehabilitation Clinic, University Malaya Medical Centre

The result reported that there was a statistically significant relationship between health anxiety and age ($r=-0.607$, $p<0.001$), which indicates a fairly strong negative relationship (Table 6).

Following that, the marital status of the respondents revealed that there was a significant relationship between the health anxiety score and marital status. The data shows that married respondents (M=29.23, SD=8.72) had a lower score of anxiety than single respondents (M=34.70, SD=7.27) where conditions [$t(148)=0.266$, $p=0.009$)] (Table 6).

There was a relationship between anxiety score and education level [F(2,147) = 16.03, $p$<0.001]. Post hoc tests showed patients with stroke who had a higher level of education (secondary and tertiary) were more anxious than those who attended primary school (Table 6).

However, the health anxiety score was not significantly related to gender or income ($p$>0.05) (Table 6).

*Table 6: The Relationship Between Health Anxiety Score and Socio-Demographic Data (n=150)*

| Variable | n | Mean | Standard Deviation | Stat Value | *p*-Value |
|---|---|---|---|---|---|
| **Age (year)**[a] | 150 | - | - | -0.607 | <0.001* |
| **Gender**[c] | | | | -0.727 | 0.468 |
|    Male | 83 | 29.50 | 8.82 | | |
|    Female | 67 | 30.54 | 8.60 | | |
| **Marital Status**[c] | | | | 2.663 | 0.009* |
|    Single | 20 | 34.70 | 7.27 | | |
|    Marriage | 130 | 29.23 | 8.72 | | |
| **Basic Education**[b] | | | | 16.03 | <0.001* |
|    Primary | 29 | 22.45 | 6.85 | | |
|    Secondary | 81 | 31.84 | 8.63 | | |
|    Tertiary | 40 | 31.60 | 7.22 | | |
| **Range of Income**[c] | | | | -1.061 | 0.291 |
|    B40 (<RM3500) | 89 | 47.31 | 8.82 | | |
|    M40 & T20 (>RM3501) | 61 | 48.85 | 8.57 | | |

*Note; a Pearson Correlation Coefficient bAnalysis of Variance (ANOVA), cIndependent t-test, *p <0.05*

## DISCUSSION

### Socio-Demographic Data among Stroke Patients

This study comprises 150 respondents attending the Rehabilitation Clinic at the University Malaya Medical Centre. The result shows that men were predominated among stroke patients, which was consistent with earlier studies (Bushnell *et al.*, 2018; Murphy & Werring, 2020).

Based on the study conducted, the highest age group was 31- 59 years old. This study was dissimilar to the study in Croatia, which discovered that stroke typically affects those over the age of 65 years old, with atherosclerosis being the most common enteropathogenic aetiology and older patients experiencing cryptogenic stroke (Bašić Kes *et al.*, 2016). Regarding marital status, the majority of the participants were married. The study by Andersen and Olsen (2018) in Denmark found a similar trend in which the majority of stroke patients were married.

In terms of educational level, the majority of the 81 respondents were in secondary school. Most of them were 89 respondents from the B40 household income bracket. Low educational level is linked to an increase in stroke incidence, particularly when paired with socioeconomic status (Wang *et al.*, 2018). Another study published in Brazil by Ramos-Lima *et al*. (2018) indicates that a low educational level is associated with an increase in stroke incidence, particularly when combined with socioeconomic and cultural issues. The study also mentioned that in many developing nations, people face challenges in adhering to treatment and maintaining a healthy lifestyle, as well as accessing information related to their health. Addressing the early start of caregiver education, upgrading stroke units for it, and the role of primary care or caregiver doctors in stroke survivor rehabilitation is essential (Ahmad, 2018).

### Knowledge Level and the Distribution of Items Regarding Stroke among Stoke Patients

Detecting a stroke increases stroke survival, and knowing stroke warning signs is crucial. The current research indicates the respondents have a good knowledge of stroke, especially in recognizing the risk of stroke and the purpose of rehabilitation during a stroke. In contrast, they have little or no information about how frequent smoking can increase the risk of stroke, the incidence of stroke every year, and irregular heartbeats (atrial fibrillation).

According to this study, our survey respondents had better knowledge of stroke than those in India and Oman, where more than half of respondents did not know which organ a stroke can damage (Pandian *et al.*, 2015). Most respondents were able to recognise types of strokes, risk factors, rehabilitation goals, and warning signs. That shows these laypeople are knowledgeable about strokes. While a study by Krzystanek *et al.* (2020) showed that the adult community in Poland had low stroke knowledge, The survey indicated that few respondents knew enough about strokes, especially in terms of time management and seeking treatment.

Wang *et al.* (2018) in China discovered that many respondents were unaware that reduced vision, dizziness, headache, and loss of consciousness are indicators of a stroke, which may increase stroke recurrence. Rosmary and Handayani (2020) observed similar results at a Jakarta hospital, where 25% of patients would not be able to identify risk factors for stroke on the open-ended quiz, where most of them answered hypertension, dyslipidemia, and diabetes. Hence, this situation forces nurses to strategize other methods in order to increase public awareness regarding stroke.

**The Score of Health Anxiety among Stoke Patients**

As of the finding, the score of anxiety among the stroke patients was relatively high. A previous study was conducted in Indonesia to investigate depression among post-stroke patients, and the findings reported that most of the respondents experienced normal levels of anxiety, while a quarter had borderline abnormal levels and a few had extreme levels of anxiety (Pratiwi, Sari, & Hernawaty, 2017). It can be suggested that health care professionals, particularly nurses, must screen for and intervene in anxiety and depression as early as feasible by offering counseling as an adjunct to rehabilitation.

In another study, Das *et al.* (2010) discovered anxiety and despair in the majority of caregivers among 199 stroke survivors, and they found a robust link between caregivers' anxiety levels and stroke patients' depression levels. It shows that the anxiety levels of the caregivers were related to the anxiety levels of stroke patients. Further study is needed to determine the relationship of psychological aspects or social support between stroke patients and their caregivers or families in this country. The people taking care of stroke survivors in the family are already feeling a heavy load as they handle the new tasks related to the physical, mental, and emotional effects of the stroke (Uy, 2023).

Additionally, in research conducted by Ayasrah, Ahmed, and Basheti (2018) at a Jordanian hospital, the majority of 226 stroke patients exhibited clinically significant levels of anxiety, indicating a confirmed instance of stress. Short stroke onset, sadness, difficulty with self-care, restricted monthly income, and vision difficulties were linked (Ayasrah, Ahmed, & Basheti, 2018). It can be concluded that lack of facilities and support, insufficient health care access, limited health literacy, and financial difficulty may be associated with the anxiety. Anxious post-stroke patients require extra care; thus, psychosocial therapy for mental health promotion or social support may be beneficial.

**The Association Between Level of Stroke Knowledge and Socio-Demographic Data Among Stroke Patients**

The result from this study shows there is no significant relationship between age, gender, marital status, income, and basic education and the level of stroke knowledge. A study by Bartlo, Irion, and Voorhees (2020) in the United States found that middle-aged stroke patients have a higher level of knowledge regarding stroke as they use the internet as a source of information more frequently than older people. A study conducted in Indonesia found that stroke survivors lacked understanding about stroke treatment, thereby increasing the risk of repeat episodes due to non-compliance with treatment (Widjaja *et al.*, 2021).

A survey led by Andersen and Olsen (2018) displays significant differences between the four marital state groups, which are married, unmarried, divorced, and widowed. A study from Denmark indicated that married people are less likely to be overweight or obese, less likely to be smokers or drink more than the recommended amount of alcohol, and more likely to have a better level of education and income (Andersen & Olsen, 2018). Meanwhile, a study done by Bašić Kes *et al.* (2016) in Croatia found there was statistical significance within the gender group.

Previous research conducted by Addo *et al.* (2012) investigated that across stroke subtypes, there has been evidence of a correlation between lower socioeconomic levels and the occurrence of stroke. Those with a lower

socioeconomic status are less able to obtain evidence-based stroke, as socioeconomic disparities in stroke risk were not completely explained by the differences in stroke risk factors or access to care. The result in this study was not similar to the study in China by Xiuyun *et al.* (2020), which mentioned that participants with higher education were associated with a lessened rate of total stroke and ischemic stroke incidents. A study in Australia stated, as shown in a substantial amount of epidemiological evidence, that low education levels were connected to stroke incidents in both women and men (Johnson *et al.*, 2016).

### The Relationship between Health Anxiety Score and Socio-Demographic Data among Stroke Patients

This study result provides a statistically significant relationship across age, education level, and marital status toward health anxiety. The finding indicated that younger people had a higher score of health anxiety compared to middle-aged and older people. A study done by Menlove *et al.* (2015) indicates the most consistent factor that did not predict poststroke anxiety was older age. This could be due to a combination of anxiety problems being less common in older people and an increased risk of a large proportion of strokes in those over the age of 65 years. A previous study conducted among young stroke survivors in China and Australia (Liang *et al.*, 2022; Morris *et al.*, 2013) discovered that anxiety is correlated to disability in the first year following stroke, as well as a decreased ability to speak and connect with others and a poorer willingness to participate in social activities. It is similar to a previous study by Menlove *et al.* (2015), which indicates that anxiety disorders are much less prevalent in older adults. Thus, the findings of this study imply that the first year after a stroke requires communication and social engagement with no difference in age categories to avoid anxiety syndromes. According to a recent study, people with emotional disturbances such as stress or depression are more likely to have strokes. Maalouf *et al.*, 2023).

Other than that, the results of this study also found that the level of health anxiety by gender was not significantly associated. In contrast, females have been found to be more prone to experiencing post-stroke anxiety than men, although there is no strong evidence to prove that gender impacts the psychological burden after stroke (Tang *et al.*, 2013; Sebestova *et al.*, 2021). Following that, the marital status of the respondents revealed that there was a significant association between health anxiety and as demonstrated by the recent analyses of Beauchamp *et al.* (2020), it appears that research including more than 200 patients conveys the importance of establishing social support and psychological well-being, which is emphasized by nonmarried status in preventing post-stroke anxiety. This study finding are similar to recent stroke literature by Beauchamp *et al.* (2020), which reported the association between PSA and nonmarried status. Thus, from the findings, social isolation and loneliness have all been attributed to a greater incidence of post-stroke anxiety.

The result showed patients who had a higher level of education, which is secondary and tertiary education, were more exposed to developing health anxiety post-stroke compared to those with primary education. Research published in Turkey by Karakus *et al.* (2017) mentioned that patients with limited education, who are often the poorest, seem more defenseless than others. However, this contradicts a recent study in the United States that found even higher education levels are vulnerable (Sebestova *et al.*, 2021). The study result for family income is similar to the study discovered in Tanzania by Jones *et al.* (2012), which indicated that low- and middle-income countries suffer more than two-thirds of the global stroke burden, signifying that a clearer understanding of stroke and its wider influence on psychological health makes them less likely to experience health anxiety compared to high-income families from urban areas that are more likely to have health anxiety. Dissimilarities to the study from India and the United Kingdom (Patel *et al.*, 2019; Broomfield *et al.*, 2014) showed that post-stroke anxiety was more common in the socioeconomically underprivileged group.

Several limitation elements have been recognised within this study. Studies with a small sample and from only one rehab center may not be representative of the larger population and may not have sufficient statistical power to detect meaningful effects. Another limitation of the study is that the targeted population was only stroke patients. It somehow restricted the caregivers, as caregivers play the most important role in managing stroke patients.

### CONCLUSION

The study shows that 68.7% of the respondents had good knowledge of stroke, and the anxiety score was moderately high. Those who are younger, unmarried, and have a high education level reported being more

anxious about their stroke condition. Therefore, worry after a stroke might hinder the recovery process for individuals. To create useful clinical and public health plans for treating anxiety disorders and preventing strokes, more research needs to be done on the link between the risk of anxiety disorders in stroke survivors and the factor that explains this link.

**Conflict of Interest**

**ACKNOWLEDGEMENT**

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