

## PREVALENCE OF FATIGUE IN ELDERLY POST-STROKE PATIENTS

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## SUMMARY

*This study aims to describe the prevalence of fatigue in elderly post-stroke patients. A cross-sectional study included 157 Subjects diagnosed with stroke (according to WHO) and treated as inpatients and outpatients at the National Geriatric Hospital, aged  $\geq 60$  years old examined or treated at National Geriatric Hospital from July to November 2021. Data were collected by using designed tools including characteristics of these patients. Entered data on Redcap and used SPSS version 22.0 for analysis. The mean age of the patients was  $73.49 \pm 9.58$  years. The female/male ratio was 0.89. The percentage of patients with independence was 42.7% (n=67). 57.3% (n=90) of the participants depended on the ratio of the components: Minimally dependent, partially dependent, very dependent, and totally dependent, respectively 10.2% (n=16); 14% (n=22); 14.6% (n=23) and 18.5% (n=29). In one hundred and fifty-seven participants, the percentage of patients with sleep disturbances accounted for 81.5% (128), which is four times the percentage of patients with good sleep at 18.5% (29). The total score of the FSS test ranged from 7 to 63 with a mean score was  $42.32 \pm 11.50$ , in which, the greatest distribution was generated by post-stroke fatigue patients (<36 points), with the percentage of 74.5% and almost triple with normal group (25.5%). The majority of patients agreed with the statement that fatigue affects the patient's motor function, the patient is prone to fatigue but it is not a permanent problem for the patient. Early detection by performing FSS test to screen for fatigue in elderly post-stroke patients, thereby providing appropriate treatment can help improve treatment effectiveness as well as patient's quality of life.*

**Keywords:** fatigue, older patients, post-stroke

## 1. INTRODUCTION

Stroke is a major cause of death and disability in many countries. It was reported that, in 2013, globally, there were nearly 25.7 million stroke survivors, 6.5 million deaths due to stroke [1]. Stroke is an especially serious problem in Asia, which has more than 60% of the world's population, and many of its countries are "developing" economies. Stroke mortality is higher in Asia than in Western Europe, the Americas or Australasia, except in the case of some countries such as Japan [1]. In Vietnam, according to information from the Ministry of Health, each year there are about 200,000 cases of stroke, it is the leading cause of death, with a rate of 10-20%, many times higher than some other common causes of death.

Fatigue is generally multidimensional, and is associated with physical, cognitive, emotional, and social factors. Fatigue is a normal condition, but it can also be medical and often mistaken for depression [2]. Fatigue is a common symptom after a stroke, with reported frequencies ranging

from 38% to 77% [3], indicating that Post-stroke Fatigue (PSF) is a major problem after stroke. Forty percent of post-stroke patients report that fatigue is one of the worst consequences of stroke [4]. The causes of fatigue after stroke are complex and are thought to be multifactorial. It is not clear what medical and socio-demographic factors are associated with PSF as findings in earlier studies are contradictory [5]. However, PSF is often associated with pain and sleep disorders<sup>8</sup> and is closely associated with depression and anxiety [6].

After a stroke, patients often have reduced working capacity, hindering their reintegration. In addition, stroke affects their physical and mental health. After a stroke, patients often have a reduced ability to work, which hinders their reintegration. Besides, stroke also affects their physical and mental health. For the patient's family, stroke creates an economic burden through loss of work capacity, care and treatment as well as mental pressure. Currently, research on fatigue of patients after

stroke is limited, the research period is long, and the current reference value is still limited. For the above reasons, we conducted this research to describe the prevalence of fatigue in elderly post-stroke patients at the National Geriatrics Hospital.

## 2. SUBJECTS AND METHODS

### 2.1. Study subject

Patients at National Geriatric Hospital in age from 60 years old, who have been diagnosed and treated at National Geriatric Hospital from 12/07/2021 to 12/11/2021 volunteered to participate in this research. Informed consent was obtained from all participants.

#### Inclusion Criteria:

- Subjects participating in the study from 50 years and older.
- Subjects diagnosed with stroke (according to WHO) by doctor and are being treated as inpatient and outpatients at the National Geriatric Hospital.
- The patients have the physical and cognitive abilities to do a face-to-face interview.
- Patients and families of patients agree to participate in research.

#### Exclusion criteria:

- Subjects with a history of stroke more than 7 years.
- Cases of dementia severity, inaccessible.
- Aphasia case limiting in describing symptoms.
- Pharyngeal paralysis, severe quadriplegia limits communication.
- History of pre-stroke psychosis: schizophrenia, major depression, bipolar disorder, substance abuse.
- Object and relatives did not agree to participate in research.

### 2.2. Methods

We performed the cross-sectional descriptive study with convenience sampling methods from July to November 2021

#### **Tools and data collection method**

General information including date of interview, contact information, full name, age, gender, level of education, occupation, living status, living area.

Data were collected by using designed tools included: Mini-Mental State Exam (MMSE), general information, Pittsburgh Sleep Quality Index (PSQI), Mini Nutritional Assessment Short Form (MNA-SF), Barthel Index (BI) for Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL), Patient Health Questionnaire – 9 (PHQ-9).

❖ **Fatigue assessment:** Using Fatigue severity scale (FSS) to assess fatigue status of the participant [7].

- Performing: The original FSS is a nine-item unidimensional questionnaire developed by Krupp, LaRocca, Muir-Nash, and Steinberg (1989). The mean score of the items is used as the FSS score. FSS consists of 9 items, each is scored using a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The participants were asked to complete the version of FSS, regarding the previous week. Total score is the sum of these items divided by the number of items.

Evaluation: High scores indicate high levels of fatigue. A total score of less than 36 suggests that you may not be suffering from fatigue. A total score of 36 or more suggests that you may need further evaluation by a physician.

### 2.3. Process of data analysis

The process of data recording, entries into Redcap and analyzed by using Statistical Package for Social Science (SPSS) software version 22 with statically  $p$  less than 0.05. Descriptive statistics were adopted to examine characteristic data: frequency, percentage, mean. Inferential statistics was done to perform comparisons between groups, using  $\chi^2$ .

### 2.4. Ethical consideration

All data collected was used for research. The results of the study were proposed for improving health of community, not for other purposes and ensure all ethical issues in biological research.

## 3. RESULTS

We conducted a cross-sectional study that included 157 post-stroke patients at National Geriatric Hospital. The interviews took place from July 1st, 2015 to November 7th, 2015

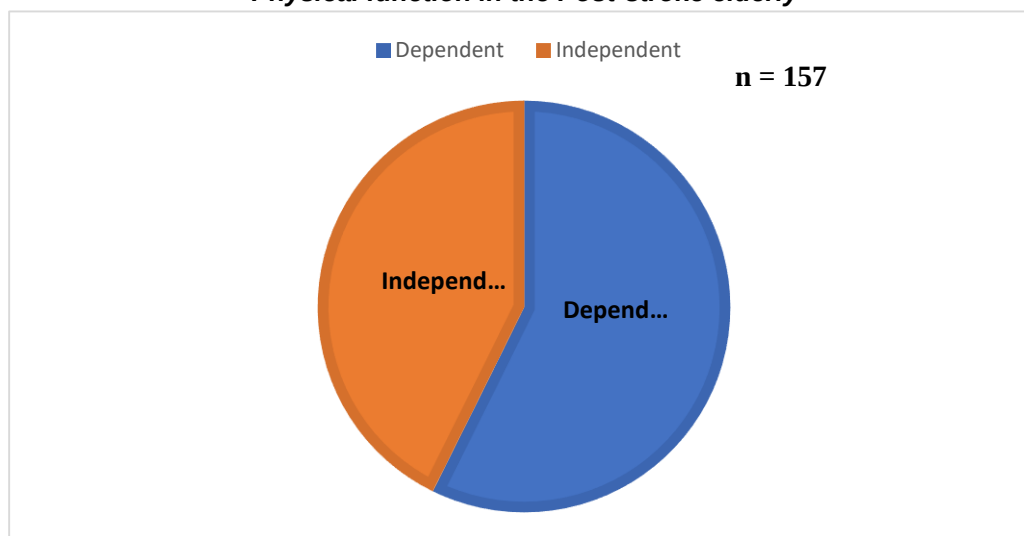
**Table 1.** Social demographic characteristics of the participants (n=157)

| Characteristics              | Frequency (n) | Percent (%) |
|------------------------------|---------------|-------------|
| Mean age                     | 73.47 ± 9.58  |             |
| Age group                    |               |             |
| <60                          | 14            | 8.9         |
| 60 – 80                      | 103           | 65.6        |
| >80                          | 40            | 25.5        |
| Gender                       |               |             |
| Male                         | 83            | 52.9        |
| Female                       | 74            | 47.1        |
| Marital status               |               |             |
| Married                      | 134           | 85.4        |
| Single/Widowed/Divorced      | 23            | 14.6        |
| Educational level            |               |             |
| Secondary school and below   | 91            | 58          |
| High school                  | 31            | 19.7        |
| College/university and above | 35            | 22.3        |

The mean age of the patients was  $73.49 \pm 9.58$  years. In which, the greatest distribution was generated by patients aged between 60 and 80, with percentage of 65.6%. Secondly, patients at over 80 years old accounted for 25.5%. Patients less than 60 years old represented only 8.9% in total number of the sample. A total of 157 individual female subjects made up 47.1% (n=74) of total number of the sample, which was smaller than distribution of male patients, namely 53.9%

(n=83). The female/male ratio was 0.89. The majority 134 persons (85.4%) were married. The widowed, single and divorced persons were only 14.6% (n=23). Additionally, majority 91 respondents (58%) had formal education, only finished secondary school and lower than that, 31 others (19.7%) graduated from high school. Especially, 22.3% of total subjects were continued to study to higher level.

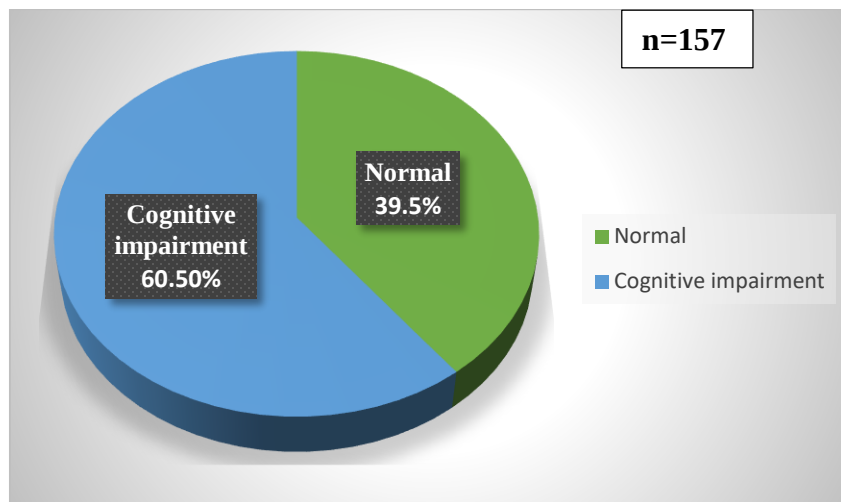
#### ***Physical function in the Post-stroke elderly***

**Figure 1.** Physical function in the Post-stroke elderly

According to BI score, the percentage of patients with independence was 42.7% (n=67). 57.3% (n=90) of the participants depended with the ratio of the components: Minimally

dependence, Partially dependent, Very dependent and Totally dependent, respectively 10.2% (n=16); 14% (n=22); 14.6% (n=23) and 18.5% (n=29).

- **Cognitive status:**



**Figure 2.** Mini – Mental State Examination (MMSE) in elderly post-stroke patients

Sixty-two patients (39.5%) were assigned to the group with no signs of cognitive impairment, whereas, ninety-five (60.5%) of the

participants were in the group of patients with signs of cognitive impairment.

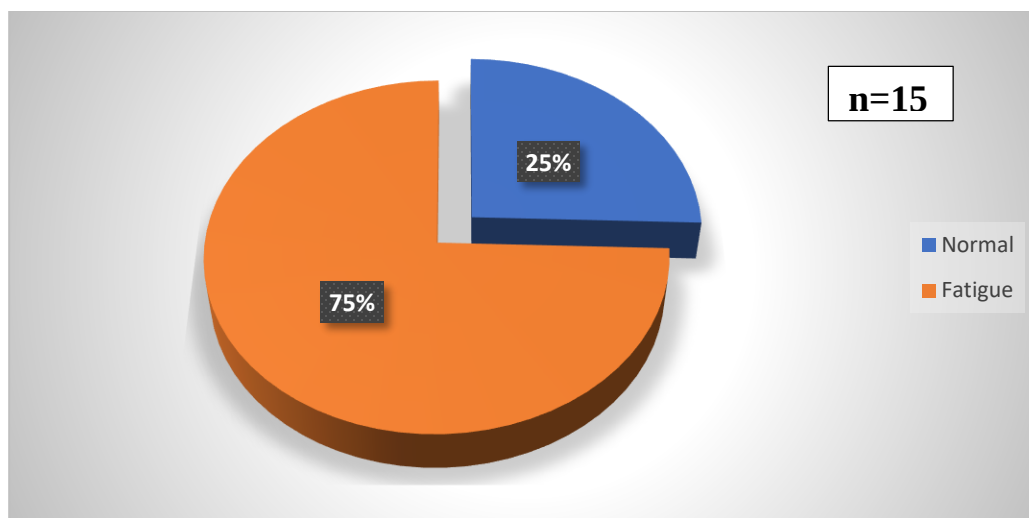
**Table 2.** Sleep disorders and depressive status in elderly post-stroke patients (n=157)

| Characteristics                                    | Frequency (n) | Percentage (%) |
|----------------------------------------------------|---------------|----------------|
| <b>Sleep disorders (based on PSQI)</b>             |               |                |
| Good sleep                                         | 29            | 18.5           |
| Poor sleep                                         | 128           | 81.5           |
| <b>The severity of depression (based on PHQ-9)</b> |               |                |
| Normal-minimal depression                          | 41            | 26.1           |
| Mild depression                                    | 47            | 29.9           |
| Moderate depression                                | 40            | 25.5           |
| Severe depression                                  | 29            | 18.5           |

In one hundred and fifty-seven participants, the percentage of patients with sleep disturbances accounted for 81.5% (128), which is

four times the percentage of patients with good sleep at 18.5% (29).

**Percentage of fatigue in elderly post-stroke patients**



**Figure 3.** Fatigue in elderly post-stroke patient distribution.

The total score of FSS test was ranged from 7 to 63 with the mean score was  $42.32 \pm 11.50$ , in which, the greatest distribution was

generated by post-stroke fatigue patients (<36 points), with percentage of 74.5% and which almost triple with normal group (25.5%).

#### **Characteristics of fatigue fields**

**Table 4.** The result of components in FSS test in post stroke patients (n=157)

| Components of FSS                                      | Score | Reference (n) | Percentage (%) |
|--------------------------------------------------------|-------|---------------|----------------|
| 1. My motivation is lower when I am fatigued.          | 1 – 4 | 45            | 28.7           |
|                                                        | 5 – 7 | 112           | 71.3           |
| 2. Exercise brings on my fatigue.                      | 1 – 4 | 67            | 42.7           |
|                                                        | 5 – 7 | 90            | 57.3           |
| 3. I am easily fatigued                                | 1 – 4 | 64            | 40.8           |
|                                                        | 5 – 7 | 93            | 59.2           |
| 4. Fatigue interferes with my physical functioning.    | 1 – 4 | 44            | 28             |
|                                                        | 5 – 7 | 113           | 72             |
| 5. Fatigue causes frequent problems for me.            | 1 – 4 | 83            | 52.9           |
|                                                        | 5 – 7 | 74            | 47.1           |
| 6. My fatigue prevents sustained physical functioning. | 1 – 4 | 49            | 31.2           |
|                                                        | 5 – 7 | 108           | 68.8           |
|                                                        | 1 – 4 | 57            | 36.3           |

| Components of FSS                                                            | Score | Reference (n) | Percentage (%) |
|------------------------------------------------------------------------------|-------|---------------|----------------|
| 7. Fatigue interferes with carrying out certain duties and responsibilities. | 5 – 7 | 100           | 63.7           |
| 8. Fatigue is among my three most disabling symptoms.                        | 1 – 4 | 109           | 69.4           |
|                                                                              | 5 – 7 | 48            | 30.6           |
| 9. Fatigue interferes with my work, family, or social life.                  | 1 – 4 | 73            | 46.5           |
|                                                                              | 5 – 7 | 84            | 53.5           |

(Note: 1-4: Disagree; 5-7: Agree)

With the statements “Exercise gives me fatigue; I am easily fatigued; Fatigue interferes with my work, family, or social life”, the percentage of participants agreeing is almost equal with disagreeing group; Except for component 5, there are 83 (52.9%) participants agreeing with fatigue causes frequent problems for them and 74 (47.1%) disagreeing.

For sentence 8, the percentage disagreeing is 69.4% and which almost double with agreeing group (30.6%). The percentage disagreeing is nearly three times the percentage agreeing in components: 1, 4, 6, which reflects the effect of fatigue on the participants' physical performance, such as: My motivation is lower when I am fatigued; Fatigue interferes with my physical functioning; My fatigue prevents sustained physical functioning.

#### 4. DISCUSSION

In this study, female subjects made up 47.1% (n=74) of total number of the sample and the male/female ratio was 1.12/1. However, in studies in Sweden, out of 91 people, 58% of women and 33% of men reported fatigue about FSS [8]. Another study by Lerdalet al., with 1893 participants aged 19 to 81 years old, had more women (26.2%) than men (19.8%) experienced high fatigue ( $p = 0.004$ ) [9]. Almost the study had the rate of female being higher than the rate of male. The reason may be explained by different research subject or sample size.

The prevalence rate decreased with age, from 35% (<70 years old), to 37.6% (70-79 years old) and dropped to 27.4% ( $\geq 80$  years old). The average age of participants in this study was 73.47 years old (SD=9.58). It was similar finds in

the research of Gillian, the average age of participants was 71.1 years (SD=10.8). And our result is also the same with study of Heruti and colleagues: stroke population characterized in the literature is in the age range of 60–74 years. One of the explanations might be older patients had more risk factors like comorbidity disease.

The percentage of patients completed secondary school and below took up 58%, 19.7% graduated from high school. Especially 22.3% of total subjects were continued to study to higher level. This result is similar to the study of Nguyen Thi Minh Tri and colleagues with the education level: low 99 patients (42.3%), average 104 (44.4%), high 31 patients (13.2%) [10]. This is similar to the results of a study in Norway where the most common level of education achieved was Middle school, equivalent to 8 years of education in 321 (55.2%) participants. But one of the disadvantages to this distribution is that the high proportion of patients with low education may affect their ability to answer the MMSE test.

Most of the post-stroke patients (85.4%) in this study were married and had family, a higher percentage than those who were single, divorced, and widowed. This result is reasonable given that most of the study's patients were 40 years of age or older. This finding is consistent with the results of a Norwegian study in patients with post-stroke fatigue, with the majority of participants being 169 married (52.6%).

In addition, post-stroke patients were discharged home with an average of 5.52 (SD=1,878) of drugs. There was a correlation between sustained users of >5 drugs and fatigue (OR: 3.43,  $p=0.03$ ). this is lower than the drug's

mean in Ostwald's study with 11.3 drugs (SD=4.94, range: 3-27) [11]. This can be explained by the age of the participants and the different sample sizes.

In this study, the percentage of dependent patients in daily activities was 70.1% (n=110) and the percentage of patients without dependence was 29.9% (n=47). There is similarity in the sensitivity study of 71 subjects recovering from stroke by Alexander, he found that 26% of the subjects scored > 95%, and 74% patients is from minimal dependent to totally dependent [12]. One hundred and twenty-six (80%) was classified as dependent in one or more IADL domains. But Thirty-one participants (19.7%) of the participants were independent of all Instrument activities of daily living (IADL). However, in the study of Badaru et al. (2013): the percentage of dependent patients accounted for 65% and independent patients accounted for 35% [13]. As the difference in age of subjects (younger and elderly patients), their ability to do IADLs is reduced.

The percentage of patients with cognitive impairment after stroke in this study was 60.5% (n=95). In the rehabilitation study of elderly stroke patients by Denti et al, it was shown that cognitive impairment was found in the 41% of patients, with only 9% showing a score less than 10/30. 94 patients (26.2%) had aphasia, while 71 (19.8%) showed neglect [14]. The difference is not too large, which can be explained by the different sample sizes and research subjects.

Of the 157 participants, 81.5% (128) had poor sleep. This rate is higher than the study in Turkey, it found that 53.3% of the subjects had poor sleep quality [15]. The difference can be explained by the different study sample size and subjects. In this study, the proportion of patients at risk of depression was 73.9%, of the total 157 participants, 29.9% of patients had signs of mild depression, 25.5% of patients had signs of moderate depression and 18.5% of patients have symptoms of severe depression. This rate is higher than the prevalence in Hackett et al's study of 31% out of 25488 post-stroke patients [16]. The difference can be explained by different sample sizes (157 < 25488) and different study subjects.

In this study, we determined that the fatigue rate in patients after stroke was 74.5% with a limit of fatigue on the FSS scale of 36 points. This is higher than the prevalence in 155 stroke patients from acute to 18 months post-traumatic in the study of Anita et al., according to FSS, the fatigue level was 40.35% [17]. The difference in results between studies could be explained by the elderly population in this study who were post-stroke patients (ages 40 to 95 years), so sleep quality is affected. affected by many factors: age, comorbidities and geriatric syndromes. The mean value of the FSS scale is  $4.702 \pm 1.278$ , similar to the mean score in the previous Swiss study, which is  $4.66 \pm 1.64$  (mean + SD) [18]. With the statements "Exercise gives me fatigue; I am easily fatigued; Fatigue interferes with my work, family, or social life", the percentage of participants agreeing is almost equal with disagreeing group; Except that 83 (52.9%) participants agreeing with fatigue causes frequent problems for them and 74 (47.1%) disagreeing. With the statement "Fatigue is among my three most disabling symptoms", the percentage disagreeing is 69.4% and which almost double with agreeing group (30.6%). The percentage disagreeing is nearly three times the percentage agreeing in components: 1, 4, 6, which reflects the effect of fatigue on the participants' physical performance, such as: My motivation is lower when I am fatigued; Fatigue interferes with my physical functioning; My fatigue prevents sustained physical functioning.

## 5. CONCLUSION

Percentage of patients with fatigue (using FSS): 74.5%. The mean value of FSS is  $42.32 \pm 11.50$ . The majority of patients agreed with the statement that fatigue affects the patient's motor function, the patient is prone to fatigue but it is not a permanent problem for the patient. Early detection by performing FSS test to screen for fatigue in elderly post-stroke patients, thereby providing appropriate treatment can help improve treatment effectiveness as well as patient's quality of life.

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