



## IMPACT OF FATIGUE IN CHRONIC STROKE PATIENTS ON MODIFIED FATIGUE IMPACT SCALE (MFIS)

### Cardiology

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### ABSTRACT

Stroke – (cerebrovascular accident) is the sudden loss of neurological function caused by an interruption of the blood flow to the brain. Mood and emotional disturbances are frequent symptoms in stroke survivors. These symptoms are distressing for both the patients and their caregivers, and negatively influence patient quality of life. Staub and Bogousslavsky defined fatigue in stroke patients as 'a feeling of early exhaustion developing during mental activity, with weariness, lack of energy, and aversion to effort'. The lack of energy and the need for frequent rest breaks can make it difficult for you to participate in rehabilitation and other everyday activities. Post-stroke fatigue is a persistent and debilitating symptom in some patients, and can have adverse effects on patient's neurological recovery, quality of life, and mortality. This study has been done to find out which component out of physical, cognitive and psychosocial is most involved in ambulatory chronic stroke patients.

### KEYWORDS

Post-stroke fatigue, Chronic stroke, Post-stroke symptoms, Modified fatigue impact scale, Fatigue assessment scale.

### INTRODUCTION -

Stroke – (cerebrovascular accident) is the sudden loss of neurological function caused by an interruption of the blood flow to the brain. <sup>(1)</sup> Mood and emotional disturbances are frequent symptoms in stroke survivors. These symptoms are distressing for both the patients and their caregivers, and negatively influence patient quality of life. Important mood/emotional disturbances include post-stroke depression (PSD), post-stroke anxiety, post-stroke emotional incontinence (PSEI), post-stroke anger proneness (PSAP), and post-stroke fatigue (PSF). <sup>(2)</sup> Staub and Bogousslavsky defined fatigue in stroke patients as 'a feeling of early exhaustion developing during mental activity, with weariness, lack of energy, and aversion to effort'. <sup>(3)</sup> Post-stroke fatigue, the invisible symptom, affects between 23% to 75% of stroke survivors. The lack of energy and the need for frequent rest breaks can make it difficult for you to participate in rehabilitation and other everyday activities. <sup>(3)</sup> Post-stroke fatigue is often confused with "being tired." It is not necessarily the same as tiredness, because it arrives without warning and rest does not always make it better. It occurs differently in every individual. It may feel like you are hitting the wall, physically, emotionally, and/or mentally. Fatigue can be either central or peripheral. Central fatigue originates in the areas of the brain related to mood, emotion and psychological arousal, and is associated with increased serotonin release. Peripheral fatigue is related to mechanisms such as neuromuscular transmission and impulse propagation, dysfunction of the sarcoplasmic reticulum, and other metabolic factors that disrupt energy provision and muscle contraction. <sup>(4)</sup> Post-stroke fatigue is a persistent and debilitating symptom in some patients, and can have adverse effects on patient's neurological recovery, quality of life, and mortality. Post-stroke fatigue is a common and frequently disabling problem of complex etiology. <sup>(5)</sup>

### NEED OF STUDY -

It is a known fact that fatigue affects the physical, psychosocial and cognitive functions in stroke patients which eventually also affects the stroke rehabilitation, quality of life and mortality. <sup>(6)</sup> There have been many studies on fatigue earlier, but not many on Indian population, which is necessary as the lifestyle in India is very different than in western countries. Also treatment will be easier if we know the cause of fatigue in stroke patients. Hence this study is to know which component out of the one's mentioned above is affecting the post-stroke fatigued patients the most in chronic stages.

**AIM -**To assess the impact of fatigue in chronic stroke patients.

**OBJECTIVE -** 1) To assess the impact of fatigue in chronic stroke patients. 2) To assess the percentage affection of the components of fatigue by MFIS.

**METHODOLOGY -** An observational study was carried out on 30 subjects in PCMC, Pune; through purposive sampling method in an OPD setup. The subjects included were all ambulatory chronic stroke

patients (more than 6 months duration since the latest incidence of stroke) and having more than 10 scoring on the fatigue assessment scale. Subjects with memory affection, behavioural affection, and unwilling patients were excluded from the study.

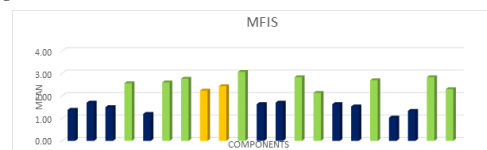
**INCLUSION -** 1) Ambulatory chronic stroke patients (> 6 months)  
2) More than 10 scoring on fatigue assessment scale.

**EXCLUSION -** 1) Memory, behaviour affection. 2) Unwilling patients.

**PROCEDURE -** Approval was taken from the ethical committee. A total of 32 participants were assessed but 2 did not score more than 10 on Fatigue assessment scale and hence were excluded. All 30 participants were explained the procedure. A written informed consent was obtained from each participant. The participants were asked all the 21 questions of the MFIS scale and the response was noted as Never – 0, Rarely – 1, Sometimes – 2, Often – 3, Almost always – 4. All participants Physical (0-36), Cognitive (0-40) and Psychosocial (0-8) subscale scores were calculated. Later the individual total scores (0-84) of the participants were calculated systematically.

### DATA INTERPRETATION –

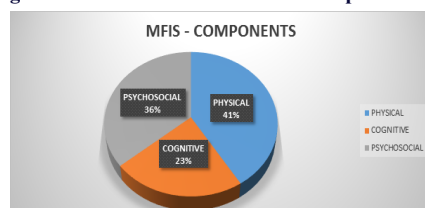
#### Graph no. 1 : Mean score of MFIS :



**INTERPRETATION:** The components of the modified fatigue impact scale are bifurcated into Physical (green), Cognitive (blue) and Psychosocial (yellow) subscales.

Component no. 10 that is "I have trouble maintaining physical efforts for long periods" falling under physical subscale being the most affected and component no. 18 "My thinking has been slowed down" falling under cognitive subscale on MFIS being the least affected. The graph mainly shows that the physical subscale is the most affected followed by psychosocial subscale and lastly cognitive subscale.

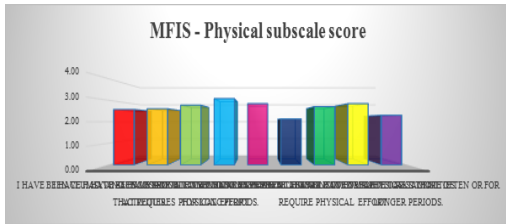
#### Pie diagram 2 : Percentile score of MFIS components.



**INTERPRETATION :** Physical component is the most affected followed by psychosocial and then cognitive component on the basis of percentile score of MFIS components.

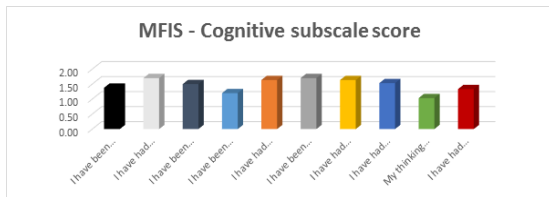
Pie diagram shows Physical subscale being most affected with 41% followed by Psychosocial with 36% and the least affected out of the three being Cognitive with 23%

**Graph no. 3 : Mean score of physical subscale on MFIS :**



**INTERPRETATION:** Out of the 9 components of the physical subscale shown above the component “I have trouble maintaining physical effort for long periods” is the most affected. Whereas the component “I have been physically uncomfortable” is showing the least affection under the Physical subscale of MFIS.

**Graph no. 4 : Mean score of cognitive subscale on MFIS :**



**INTERPRETATION :** Out of the 10 components of the cognitive subscale of MFIS the components “I have had difficulty paying attention for long periods of time” and “I have been less motivated to do anything that requires thinking” is scoring the most and “My thinking has been slowed down” is scoring the least.

**Graph no. 5 : Mean score of psychosocial subscale on MFIS :**



**INTERPRETATION :** Out of the two components of psychosocial subscale of MFIS “I have been limited in my ability to do things away from home” being more affected as compared to “I have been less motivated to participate in social activities”.

**DISCUSSION -** An Observational study was done on 30 chronic stroke patients which includes 21 males and 9 females with mean ages  $62.47 \pm 11.97$  yrs. On MFIS, the physical subscale component was 66.11 % , Psychosocial subscale component 57.88 % and Cognitive subscale component was 36.7 %The overall involvement of all subjects on MFIS is 50.18 % . The patients experienced utmost fatigue, while performing any physical activity, especially by performing any physical activity for long periods of time. The reason behind this being increased tone i.e spasticity and reduced VC, these factors eventually result in increased energy expenditure, thus leading to increased physical fatigue. This study corresponds with a study done by Mari Thoresen Loholm, which suggested that Post stroke fatigue (PSF) exerts a negative impact on a patient's daily activities such as decreased participation in physical activities and rehabilitation.<sup>(11)</sup> Following physical subscale was the psychosocial subscale at 57.88 % in which the subjects had the most difficulty in attending any functions and festivities outside the comfort of their home which was due to sudden change in the lifestyle of the individuals following the incidence of stroke along with this was also associated depression, anxiety, stigma and feeling of lacking abilities as compared to those one had earlier or by comparison with other normal individuals of the same age. Our study is in accordance with Snaphaan, L., S. Van Der Werf et al who

had examined the temporal relationship between fatigue and emotional factors. This study showed that presence of depression and/or anxiety 2 months post-stroke, predicted fatigue 18 months after stroke (10). A meta-analyses from 2014 also showed a significant association between fatigue and depressive symptoms and a trend towards an association between fatigue and anxiety.<sup>(10)</sup> The least percentile mean was of the cognitive subscale (36.7 %) in which the subjects had difficulty in performing any activity that involves paying attention for long periods of time and they were equally less motivated to do anything that requires thinking. The reason behind this is that post an episode of stroke the attention, memory, language, orientation and all other executive functions of the individual are affected and it results in major cognitive issues like memory problems and vascular dementia. Johansson and Rönnbäck reported, in a Swedish study examining 24 patients in the chronic phase after stroke, a significant association between fatigue, processing speed and attention. Limitations in this study were a small sample size and not controlling for depression.<sup>(10)</sup> Three reviews from 2014 and 2015 concluded that stroke-related impairment of executive function (planning, reasoning, problem solving), attention and processing speed were associated with fatigue in some studies. In summary the significance of cognitive impairment in relation to fatigue is poorly understood, both when it comes to cognitive profile and the impact of depression. The natural recovery of cognitive function after stroke appears to plateau and stabilize after 1-2 years, and neuropsychological assessment should thus be done long term after stroke.

**CONCLUSION -** The study concludes that the impact of fatigue was highest of the Physical subscale component of MFIS, followed by Psychosocial subscale component and lastly Cognitive subscale component.

**LIMITATION OF THE STUDY -** Further follow up can be done.

**FUTURE SCOPE OF THE STUDY -** Different outcome measures can be used. A more complex task can be analysed. At the end of treatment session, retention of the learned activity can be assessed.

**RELIABILITY AND VALIDITY -** Developers Michielsens and colleagues analysed the Fatigue assessment scale's psychometric properties and found an internal consistency of .90<sup>(6)</sup> The modified fatigue impact scale has been shown to possess an internal consistency ranging from 0.65 to 0.92.<sup>(7)</sup> In which the physical and the cognitive subscale of the scale were homogeneous (Cronbach's alpha 0.92, 0.88 and 0.92, respectively), but the psychosocial subscale had a Cronbach's alpha of 0.65.<sup>(7)</sup>

**OUTCOME MEASURES -**

Modified fatigue impact scale is used for this study

Following is a list of statements that describe the effects of fatigue. Please read each statement carefully, the circle the one number that best indicates how often fatigue has affected you in this way during the past 4 weeks. (If you need help in marking your responses, tell the interviewer the number of the best response.) Please answer every question. If you are not sure which answer to select choose the one answer that comes closest to describing you. Ask the interviewer to explain any words or phrases that you do not understand.

Because of my fatigue during the past 4 weeks

	Never	Rarely	Sometimes	Often	Almost Always
1. I have been less alert.	0	1	2	3	4
2. I have had difficulty paying attention for long periods of time.	0	1	2	3	4
3. I have been unable to think clearly.	0	1	2	3	4
4. I have been clumsy and uncoordinated.	0	1	2	3	4
5. I have been forgetful.	0	1	2	3	4
6. I have had to pace myself in my physical activities.	0	1	2	3	4
7. I have been less motivated to do anything that requires physical effort.	0	1	2	3	4
8. I have been less motivated to participate in social activities.	0	1	2	3	4
9. I have been limited in my ability to do things away from home.	0	1	2	3	4
10. I have trouble maintaining physical effort for long periods.	0	1	2	3	4
11. I have had difficulty making decisions.	0	1	2	3	4
12. I have been less motivated to do anything that requires thinking.	0	1	2	3	4
13. My muscles have felt weak.	0	1	2	3	4
14. I have been physically uncomfortable.	0	1	2	3	4
15. I have had trouble finishing tasks that require thinking.	0	1	2	3	4
16. I have had difficulty organizing my thoughts when doing things at home or at work.	0	1	2	3	4
17. I have been less able to complete tasks that require physical effort.	0	1	2	3	4

	Never	Rarely	Sometimes	Often	Almost Always
18. My thinking has been slowed down	0	1	2	3	4
19. I have had trouble concentrating.	0	1	2	3	4
20. I have limited my physical activities.	0	1	2	3	4
21. I have needed to rest more often or for longer periods.	0	1	2	3	4

**Instructions for Scoring the MFIS**

Items on the MFIS can be aggregated into three subscales (physical, cognitive, and psychosocial), as well as into a total MFIS score. All items are scaled so that higher scores indicate a greater impact of fatigue on a person's activities.

**Physical Subscale**

This scale can range from 0 to 36. It is computed by adding raw scores on the following items: 4+6+7+10+13+14+17+20+21. \_\_\_\_\_ 0

**Cognitive Subscale**

This scale can range from 0 to 40. It is computed by adding raw scores on the following items: 1+2+3+5+11+12+15+16+18+19. \_\_\_\_\_ 0

**Psychosocial Subscale**

This scale can range from 0 to 8. It is computed by adding raw scores on the following items: 8+9. \_\_\_\_\_ 0

**Total MFIS Score**

The total MFIS score can range from 0 to 84. It is computed by adding scores on the physical, cognitive, and psychosocial subscales. \_\_\_\_\_ 0

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