ORIGINAL ARTICLE

FREQUENCY OF POST-STROKE FATIGUE AND ITS ASSOCIATION WITH QUALITY OF LIFE IN PAKISTANI POPULATION: A CROSS SECTIONAL STUDY

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Abstract

Background: Fatigue after stroke is a frequently occurring and debilitating consequence of stroke often neglected by the clinicians during the process of rehabilitation and recovery. **Objective**: The main objective of the study was to determine the frequency of fatigue after stroke and its impact on health related quality of life. It was hypothesized that fatigue is strongly to heath related quality of life. **Materials and Methods**: A cross sectional study, which recruited 105 stroke patients through convenient sampling after the inclusion criteria, was met, out of which, 58 were males and 47 were females. The data was collected at two physiotherapy centers of Rawalpindi and Islamabad through a demographic questionnaire, Fatigue Assessment Scale (FAS), and Baseline Euro Quality of life scale (EQ-5D). The data analysis was conducted using SPSS version 21. **Results**: Around 82% of the total study participants exhibited moderate to severe post stroke fatigue with a higher prevalence in females (97.8%). Both physical and mental aspects of PSF demonstrated a significant negative linear relationship with health related quality of life *($p<0.05$)*. Nearly all categorical predictors of health related quality of life (mobility, self-care, usual activities, pain, and anxiety-depression) demonstrated a significant relationship with PSF except for pain showed insignificant association with mental fatigue. **Conclusion**: Fatigue was found to affect most stroke survivors in acute and demonstrated an inversely proportional relationship with quality of life. A higher score on fatigue scale had a negative correlation with all the predictors of health related quality of life including mobility, pain, self-care, performance of daily life activities.

Keywords: Post-stroke fatigue, stroke, quality of life, frequency

INTRODUCTION

According to WHO, cerebrovascular accident (CVA) more commonly known as stroke is a disorder clinically characterized by central or focal disruption of cerebral function which lasts for more than 24 hours with no obvious cause other than that of vascular origin.1 Stroke falls amongst the worldwide leading causes of morbidity and mortality.[2] In Pakistan, the incidence of stroke is 250 per 100,000 and 350,000 people suffer from stroke annually.[3] Occurrence of stroke is usually followed by chronic and persistent health problems which require special attention as they possess a long recovery process and comprehensive rehabilitation. Stroke is usually associated with a variety of key neurological impairments along with other complications, which show a strong association and influence the recovery and rehabilitation of the patient. These include: depression, anxiety, fatigue, apathy, insomnia and other sleep disturbances.[4]

Research shows that fatigue is a common debilitating symptom which occurs after several neurological disorders like post-polio syndrome, Multiple sclerosis, traumatic brain injury, Parkinson's disease and cerebrovascular accident.[5]

Generally fatigue is defined as a state of tiredness, lack of energy and inability to execute effort for a particular task.[6] Fatigue can be either physiological or pathological; physiological fatigue also known as subjective fatigue is a state of weariness, which occurs normally following overexertion and ameliorated following a rest period. On the other hand, pathological or objective fatigue refers to continuous tiredness not related to prior activity level and does not improve following rest.[7] The experience of pathological fatigue has been described by the stroke patients different than that of the fatigue they experienced normally before the occurrence of stroke and that the fatigue they underwent following stroke is a direct consequence of CVA itself.[14] Post-stroke Fatigue (PSF) can be further categorized into physical and mental fatigue; the muscle tiredness which results in the disruption of the performance of physical activity is referred to as physical fatigue(8). On the other hand, mental fatigue refers to lack of ability to concentrate and tolerate mental exertion for longer durations.[8]

Fatigue is one of the incapacitating symptoms experienced post stroke; the reported prevalence of PSF in the literature ranges from around 32% to 82%.[5,9,10,11] PSF can adversely affect physical and psychological functioning and reduced functional independence which leads to poor health-related quality of life (HRQoL)[5,12] and consequently have negative implications in terms of rehabilitation and the patient's family, social and occupational life.[5]

Van de Port et al conducted a longitudinal study which showed that PSF is significantly associated with reduced Instrumental activities of Daily Living (IADLS) and HRQoL.[13] Another study which explored the effect on activities of daily living (ADLs) reported that PSF is significantly

correlated with dependence in carrying out primary and secondary ADLs as well as higher mortality rates. Moreover, it was identified that the physical aspects of quality of life were most severely affected by PSF. [14] Bendz et al also explored the impact of fatigue and concluded that fatigue influenced the rehabilitation process and recovery negatively.[4] Mental aspect of PSF was found to be the most commonly occurring symptom after stroke which served as a barrier in the rehabilitation of the patients and showed a negative influence on the functional independence of patients.[15] Roding et al. conducted a qualitative study to document the fatigue experiences of young stroke survivors ; the findings of the study concluded that fatigue had been the most debilitating and incapacitating aspect after stroke effecting their lives and independence.[16] The evidence in the literature suggests that PSF has received relatively little attention by the clinicians in rehabilitation and interventional studies targeting fatigue and its potential exacerbating symptoms are required to help reduce its negative impact on HRQoL, rehabilitation process and recovery of the patients.

METERIAL & METHODS

A cross sectional study was conducted to evaluate the impact of post-stroke fatigue on quality of life months from January 2016 to July 2016 at two physiotherapy centers of Rawalpindi and Islamabad (Pakistan Railway Hospital Rawalpindi and Neurocounsel, Islamabad). Approval from ethical committee of Neurocounsel Islamabad and Railway Hospital Rawalpindi was obtained and all participants involved in the study gave written informed and signed consent. Fig. 1 provides a flow chart for different stages through the study. The study participants were recruited in the study through convenient sampling. After the inclusion criteria was met, and informed consent was taken, 110 stroke survivors were included in the study. The sample included all cases of any pathological subtype of stroke; both males and females; individuals with post-stroke duration of at least one month and aged more than 18 years with no upper age limit. The study excluded**:** cognitively impaired patients who were unable to understand basic instructions (2-step command)**;** unable to understand English, Urdu or Punjabi language**;** individuals with any medical instability which can alter the perception of fatigue and co-morbidities which can also act as a confounding factor for PSF (e.g. cardiovascular involvement).

Data was collected through Fatigue assessment scale (FAS) and Euro Quality of Life Scale (EQ-5D). The FAS is a 10-item scale with 10 statements about two different aspects of fatigue (mental and physical). It is a valid and reliable tool in stroke population with a minimum score of 10 and a maximum score of 50. A higher score indicates greater fatigue. FAS has been described by Mead et al to possess best test-retest reliability in stroke individuals (17). EQ-5D comprises of two parts, one categorical domain, and a visual numerical scale. The categorical scale consists of five separate domains, which includes mobility, self-care, usual activities, pain/discomfort, and anxiety/depression on an ordinal scale of 3 levels of perceived problems. Level 1 indicates no problem, level 2 some problem while level 3 denotes severe problem perceived by the patient. The second part of this tool incorporates a visual analogue scale (VAS) in which a score of 100 is indicative of the best health possible while zero is indicative of worst health. This scale is reported to have concurrent and discriminant validity to measure HRQoL in stroke population(18). The descriptive and inferential data analysis was conducted by utilizing SPSS version 21.

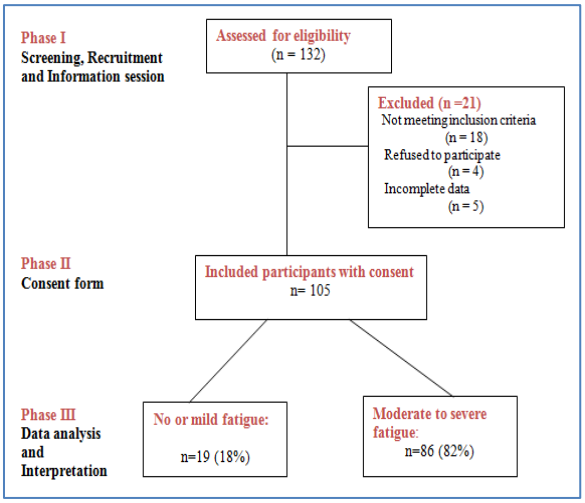

Figure: 1 Study flow diagram

RESULTS

Out of 110 participants, 5 failed to provide complete data (92% response rate) and a final of 105 individuals were included in the descriptive and inferential statistical analyses. Table 1 demonstrates demographic and clinical characteristics of the study participants. There were a total of 105 respondents out of which 58 (55.2%) were males and 47 (48.6%) were females. The age of the participants ranged from 22-76 years and the mean age was found to be 52 years ± 5.88.

Table 1 Study characteristics

Characteristic	Range	Mean	(SD)
Age	22-76	52	14.01
Mental fatigue on FAS	5-25	16	5.88
Physical fatigue on FAS	5-25	15.85	5.33
Total fatigue on FAS	10-47	31.98	10.30
Quality of life on EQ-VAS	25-65	43	9.81

Table 2 shows the percentage of participants according to severity of fatigue. Fatigue Assessment scale (FAS) measured two domains of fatigue: mental and physical with a total score of 50 and a score of 25 for each respectively. Out of 25, a score of 5 denoted no fatigue; scores which ranged from 6-10 indicated mild fatigue; scores which fell in the range of 11-17 meant moderate fatigue and finally severe fatigue scores above 18 were interpreted as severe fatigue. Of the total study participants, 79% exhibited moderate to severe mental fatigue, 77% demonstrated moderate to severe physical fatigue while overall 82% showed moderate to severe total fatigue on FAS.

Table 2: Study participants according to severity of fatigue

Fatigue on FAS	No fatigue	Mild	Moderate	Severe
Mental fatigue	5.7%	15.2%	33.3%	45.7%
Physical Fatigue	1.9%	21%	27.6%	49.5%
Total Fatigue	1.9%	15.2%	34.3%	48.6%

Percentage of stroke survivors demonstrating problems in different domains of HRQoL are summarized in Fig.2. The mobility domain demonstrated that 81.9% of the total study participants had some kind of problem in walking about, 2.9% faced no problem in walking about while 15.2% were confined to bed. Regarding self-care, 9.5% participants faced no problems, 43.8% had some problems in washing and dressing themselves, and the remaining 46.7% were unable to wash or dress on their own. On the domain of usual activities (e.g. work, study, family, housework etc.), 8.6% of the stroke survivors faced no problems in performing their usual daily activities, 47.6% experienced some problems while 43.8% were unable to perform their usual activities at all. The results on the pain scale of EQ-5D revealed that 39% of the participants had no pain or discomfort, 48.6% faced moderate pain or discomfort, and 12.4% experienced severe pain or discomfort. On anxiety-depression scale 25.7% of the stroke individuals found to have no anxiety or depression, 62.9% experienced moderate anxiety or depression while the remaining 11.4% felt extremely anxious or depressed.

On visual analogue scale known as EQ-VAS, the score of the stroke survivors ranged from 25-65 with a mean of 43± 9.81.

The correlation between PSF (mental and physical) and HRQoL on the numerical scale was found out through Pearson's correlation test. The results demonstrated that there is a significant linear relationship between PSF and HRQoL (95% CI; r= -0.49, r= -0.45; P=0.00). The association of mental and physical fatigue post stroke with categorical domains of EQ-5D: mobility, self-care, usual activities, pain and anxiety-depression was analyzed through Pearson's Chi square test. All the domains showed significant association with physical and fatigue (95% CI; P=0.00) except for pain with an insignificant association with mental fatigue (95% CI; P=0.12) i.e. pain was independent of mental fatigue after stroke.

DISCUSSION

The impact on PSF has been reported in the literature with decreased functional independence, poor rehabilitation outcomes, and consequently a greater mortality rate. These are particularly related with reduced health-related quality of life in long term. This study found an association of PSF with nearly all the components of HRQoL measured by EQ-5D including components of functional independence (mobility, self-care, usual activities). This confirmed our hypothesis that PSF has a linear relationship with quality of life. Glader et al conducted a study in Sweden to investigate different variables associated with PSF; the results revealed that PSF was significantly associated with higher degree of dependence in exhibiting activities of daily living.[14] However, these restrictions might be a consequence of other commonly occurring complications after stroke like balance problems and physical deconditioning and might not be direct result of PSF; therefore, more studies are needed to probe and produce stronger conclusions. Pain was the only component of HRQoL which did not reveal a significant relationship with mental aspect of PSF in the current study; nonetheless the physical aspect of PSF showed a significant association. Pain is a common debilitating symptom after stroke and is frequently reported to be a hindrance in recovery of the patient and mediate long term quality of life.[19] Apperlos conducted a study on the prevalence and predictors of pain and fatigue post stroke and reported no significant relationship between PSF and painful symptoms.[20] On the other hand, Naess et al demonstrated that the stroke survivors who experienced painful symptoms exhibited greater fatigue scores on Fatigue Severity Scale.[21]

The strength of the present study was a good response rate (92%) from the participants while the limitation is the design of the study i.e cross sectional which is unable to make conclusions about the temporal and causal

relationship of fatigue with quality of life after stroke. Further studies with longitudinal designs are required to make robust conclusions about the associations of PSF.

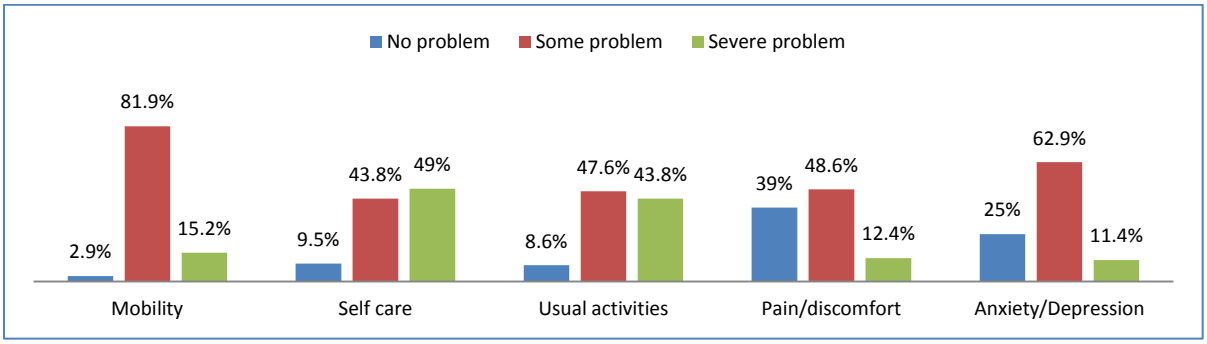

Figure 2: Percentage of stroke survivors demonstrating problems in different domains of HR-QoL

CONCLUSION

Fatigue was found to affect most stroke survivors in acute stage and demonstrated s an inversely proportional relationship with quality of life. A higher score on fatigue scale had a negative correlation on all the predictors of health related quality of life including mobility, pain, self-care, performance of daily life activities.

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