

Fear of Falling Among Stroke Survivors in Assam, India: A Cross-Sectional Study

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ABSTRACT

Introduction: Fear of falling (FoF) is a common problem after a stroke. It leads to restricted activities, less mobility, more falls, and a lower quality of life. While FoF has been studied a lot in Western countries, research from Northeast India is still limited.

Aim: This study aims to find out how common fear of falling is among stroke survivors in Assam, India. It also looks at how it relates to demographic and clinical factors.

Materials and Methods: We conducted a cross-sectional observational study with 220 stroke survivors from outpatient neurorehabilitation and community settings in Assam. We measured fear of falling using the Falls Efficacy Scale-International (FES-I). We classified scores into low concern (16-22) and high concern (23-64). Descriptive statistics summarized participant characteristics. We used cross-tabulation analysis to explore the distribution of FoF by age, gender, stroke type, stroke duration, and fall history.

Results: The average age of participants was 64.8 ± 10.9 years. Out of 220 participants, 190 (86.36%) showed high concern about falling. High FoF was consistent across genders (87.40% in males; 84.95% in females) and all age groups. Survivors of hemorrhagic stroke had a slightly higher prevalence (92.11%) compared to those with ischemic strokes (85.16%). A strong link was found between FoF and fall history: 64.10% of those with no falls reported high FoF, 95.92% with one fall, and 100% with two or more falls. Participants within the first year post-stroke had a higher prevalence than those beyond 12 months.

Conclusion: Fear of falling is very common among stroke survivors in Assam. A history of falls is the strongest related factor. It is necessary to routinely screen for this issue and provide rehabilitation strategies that address both physical and mental health to improve functional outcomes.

Keywords: Falls Efficacy Scale-International, Fear of falling, Prevalence, Rehabilitation, Stroke

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INTRODUCTION:

Stroke is a significant global public health issue. It continues to be one of the main causes of long-term disability and death worldwide [1,2]. Over the past two decades, the burden of stroke around the world has increased dramatically, especially in low- and middle-income countries [2]. India has also seen a notable rise in the number of stroke cases and prevalence, leading to serious functional limitations, strain on caregivers, and lower quality of life for survivors [3].

Stroke survivors often face challenges such as weakness on one side of the body, changes in body awareness, decreased control over posture, and unsteady walking.

These problems significantly raise the risk of falls and injuries related to falls [9,11]. Falls after a stroke are common and can lead to fractures, anxiety, hospital stays, and a further decline in independence [11,12]. Besides physical challenges, stroke survivors frequently experience psychological issues like depression, anxiety, and fear of falling (FoF) [4,8].

Fear of falling is the ongoing worry about falling, which can cause individuals to avoid activities they could otherwise perform [5]. It is a complex issue influenced by self-confidence in balance, feelings of instability, obstacles in the environment, and past experiences with falls [16,18]. FoF is linked to less participation in daily

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activities, slower walking, decreased confidence in balance, and a poorer quality of life [6,10]. Moreover, avoiding activities due to fear can lead to less movement and physical decline, which further raises the risk of falls and enhances fear, creating a negative cycle [18].

The reported rates of FoF among stroke survivors vary widely, ranging from about 42% to 83% [6,9]. A history of previous falls is often cited as one of the strongest indicators of FoF after a stroke [8,13,17]. However, data from India is limited, and information from Northeast India, including Assam, is even scarcer. Environmental factors like uneven surfaces, a lack of accessible infrastructure, and limited structured rehabilitation services may further affect both fall risk and fear perception in this area.

This study aims to determine the prevalence of fear of falling among stroke survivors in Assam and to explore its relationship with specific demographic and clinical factors.

MATERIALS AND METHODS:

Study Design and Setting:

This was a cross-sectional observational study involving stroke survivors in Assam, India. Participants were recruited from outpatient physiotherapy departments, neurology follow-up clinics, and community-based stroke rehabilitation services. The study followed STROBE guidelines.

Participants:

Stroke survivors attending outpatient neurorehabilitation services were recruited in sequence.

- **Inclusion Criteria:** Participants were included if they had a clinically confirmed ischemic or hemorrhagic stroke diagnosis by a neurologist, were aged 18 years or older, were medically stable, could stand (with or without an assistive device), and could understand and follow simple verbal instructions.
- **Exclusion Criteria:** Participants were excluded if they had severe cognitive impairment (clinically determined), other neurological disorders (like Parkinson's disease or multiple sclerosis), severe visual or vestibular disorders that affected balance, or acute medical instability.

Outcome Measures:

- **Fear of Falling:** We assessed fear of falling using the Falls Efficacy Scale-International (FES-I), which includes 16 items that measure concern about falling during daily activities. Each item is scored from 1 (not at all concerned) to 4 (very concerned), resulting in a total score ranging from 16 to 64. For estimating prevalence, scores were divided into low concern (16-22) and high concern (23-64) [21].
- **Demographic and Clinical Variables:** We recorded age group, gender, stroke type (ischemic or hemorrhagic), stroke duration (1-6 months, 7-12

months, over 12 months), and fall history in the past 12 months (0, 1, 2, more than 2 falls).

Data Collection Procedure:

A trained physiotherapist screened eligible participants. We gathered demographic and clinical data from medical records and confirmed it through an interview. We administered the FES-I using a face-to-face interview format to reduce literacy bias. For participants with mild language difficulties, we simplified questions without changing their meaning. Data collection took about 20 to 25 minutes per participant.

Statistical Analysis:

We analyzed the data using SPSS version 26.0. Continuous variables were reported as mean plus or minus standard deviation. Categorical variables were expressed as frequency and percentage. We calculated the overall prevalence of FoF as the proportion of participants with a FES-I score of 23 or higher. Cross-tabulation analysis was conducted to explore the distribution of FoF across age group, gender, stroke type, stroke duration, and fall history.

RESULTS:

A total of 220 stroke survivors were included in the analysis. The average age of participants was 64.8 ± 10.9 years. Out of the total sample, 127 (57.7%) were male and 93 (42.3%) were female. The largest group of participants was in the 61-70 years age range (35.0%), followed by those aged 50-60 years (28.6%). Ischemic stroke was the most common type, accounting for 82.7%, while 17.3% had hemorrhagic stroke. Most participants were more than 12 months post-stroke (68.2%). In terms of fall history over the past 12 months, 78 (35.5%) reported no falls, 49 (22.3%) reported one fall, 39 (17.7%) reported two falls, and 54 (24.5%) reported more than two falls [Table-1].

Based on the Falls Efficacy Scale-International (FES-I), 190 participants (86.36%) showed high concern about falling (FES-I score 23-64), while 30 participants (13.64%) showed low concern (FES-I score 16-22) [Table-2]. When we looked at gender distribution, 111 of 127 males (87.40%) and 79 of 93 females (84.95%) had high concern about falling. The prevalence of fear of falling was similar across both genders [Table-3].

Across different age groups, fear of falling remained consistently high. The highest prevalence was seen in the 50-60 years group (90.48%), followed by the 61-70 years group (88.31%). Participants aged 71-80 years and over 80 years both showed a prevalence of 80.0%. Even among those younger than 50 years, 85.0% reported high concern about falling [Table-3]. In terms of stroke subtype, 155 of 182 ischemic stroke survivors (85.16%) reported high concern about falling, while 35 of 38 hemorrhagic stroke survivors (92.11%) reported high concern [Table-3].

A clear relationship was noted between fall history and fear of falling. Among participants with no previous falls, 50 of 78 (64.10%) showed high concern. This increased to 47 of 49 (95.92%) among those with one fall. All

participants with two falls (100%) and those with more than two falls (100%) showed high concern about falling [Table-3]. Participants in the early post-stroke period had a higher prevalence of fear of falling. High concern was noted in 30 of 32 participants (93.75%) within 1-6 months

post-stroke and in 35 of 38 participants (92.11%) between 7-12 months. Among those more than 12 months post-stroke, 125 of 150 (83.33%) showed high concern [Table-3].

[Table-1]: Socio-demographic and Clinical Characteristics of Participants (N = 220)

Variable	Category	n	%
Gender	Male	127	57.7
	Female	93	42.3
Age group (years)	<50	20	9.1
	50-60	63	28.6
	61-70	77	35.0
	71-80	50	22.7
	>80	10	4.5
Stroke type	Ischemic	182	82.7
	Hemorrhagic	38	17.3
Stroke duration	1-6 months	32	14.5
	7-12 months	38	17.3
	>12 months	150	68.2
Fall incidence (past 12 months)	0	78	35.5
	1	49	22.3
	2	39	17.7
	>2	54	24.5

[Table-2]: Prevalence of Fear of Falling Among Stroke Survivors (N = 220)

Fear of falling (FES-I)	n	%
High concern (23-64)	190	86.36
Low concern (16-22)	30	13.64
Total	220	100

[Table-3]: Distribution of Fear of Falling According to Demographic and Clinical Variables (N = 220)

Variable	Category	High Concern n (%)	Low Concern n (%)	Total (n)
Gender	Male	111 (87.40)	16 (12.60)	127
	Female	79 (84.95)	14 (15.05)	93
Age Group (years)	<50	17 (85.0)	3 (15.0)	20
	50-60	57 (90.48)	6 (9.52)	63
	61-70	68 (88.31)	9 (11.69)	77
	71-80	40 (80.0)	10 (20.0)	50
	>80	8 (80.0)	2 (20.0)	10
Stroke Type	Ischemic	155 (85.16)	27 (14.84)	182
	Hemorrhagic	35 (92.11)	3 (7.89)	38
Fall History	0 falls	50 (64.10)	28 (35.90)	78
	1 fall	47 (95.92)	2 (4.08)	49
	2 falls	39 (100)	0 (0)	39
	>2 falls	54 (100)	0 (0)	54
Stroke Duration	1-6 months	30 (93.75)	2 (6.25)	32
	7-12 months	35 (92.11)	3 (7.89)	38
	>12 months	125 (83.33)	25 (16.67)	150
Overall	-	190 (86.36)	30 (13.64)	220

DISCUSSION:

The present study found a high prevalence of fear of falling at 86.36%, among stroke survivors in Assam. This rate is higher than or similar to the upper range of previously reported values in stroke populations [6-9]. Falls after a stroke are common and are closely connected to balance problems, gait issues, and lower postural

control [10-12]. Additionally, environmental dangers and limited access to rehabilitation may increase both the number of falls and the fear of falling in areas like Assam.

Fear of falling was consistently high for both genders and all age groups in this study. While research on older adults living in the community often shows higher fear of falling rates in females and older age groups [15,16], stroke-

related impairments likely play a significant role in lessening the impact of demographic factors [6,8]. Similar results have been observed in stroke-specific populations, where neurological issues tend to be the main predictors of fear [4,6].

Hemorrhagic stroke survivors showed a slightly higher prevalence compared to ischemic stroke survivors. However, the difference was minor, indicating that the severity of functional impairment may matter more than the stroke type alone [12]. Participants within the first year after the stroke had a higher fear of falling (FoF) than those who were more than 12 months post-stroke. Early stages after a stroke involve incomplete motor recovery, uneven gait, and lower confidence in balance, which may increase fear perception [21].

A key finding of this study was the strong link between a history of falls and fear of falling. Participants who had two or more falls reported a 100% rate of high concern. Previous studies have consistently shown that past falls are one of the strongest predictors of fear of falling after a stroke [8,13,17]. A fall can heighten feelings of vulnerability and lower confidence in balance, which leads to avoidance behaviors. This restriction of activity can result in physical decline and further increase the risk of falling, creating a self-reinforcing cycle [18].

These findings show the need for routine FoF screening during stroke rehabilitation using validated tools like the FES-I [20]. Rehabilitation programs should include task-specific balance training, gait rehabilitation, strength-building, fall-prevention education, and psychological support for fear avoidance [14,19]. Focusing on both physical and psychological aspects may boost confidence, participation, and functional recovery.

LIMITATION(S):

The cross-sectional design limits causal interpretation. Participants reported their fall history, which may be influenced by recall bias. We did not perform multivariate regression to account for factors like depression, balance impairment severity, or functional status. Future studies should use multivariate models over a longer period.

CONCLUSION(S):

Fear of falling is highly prevalent among stroke survivors in Assam. Previous fall history demonstrated the strongest association with fear of falling. Routine screening and comprehensive rehabilitation strategies addressing both physical and psychological aspects of fall risk are essential to improve functional outcomes and reduce disability.

ETHICAL APPROVAL:

The study protocol was approved by the Institutional Ethics Committee of Assam down town University, Assam (Approval No: AdtU/Ethics/PhD Scholar/2023/54), Dated: 11/10/2023. The study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrolment.

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CONFLICT OF INTEREST:

The authors declare that there is no conflict of interest regarding the publication of this article.

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