RELATIONSHIP BETWEEN FEAR OF FALLING AND FALL RISK AMONG OLDER PATIENTS WITH STROKE: A STRUCTURAL EQUATION MODELING

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CHEN ET AL. BMC GERIATRICS (2023)
IF:4.07,Q1

INTRODUCTION

- Falls in older persons occur **commonly**
- Falls often go **without clinical attention** for a variety of reasons:

- the patient never mentions the event to a healthcare provider;

- there is no injury at the time of the fall;

- the provider fails to ask the patient about a history of falls;

- either provider or patient erroneously believes that falls are an inevitable part of the aging process

✓ Significant **morbidity and mortality** may result from falls in older

✓ A number of the physical conditions and environmental situations that predispose to falls are **modifiable.**

- Clinicians caring for older patients need to routinely inquire about falls, **assess** for fall risk, and address modifiable underlying risk factors.

INTRODUCTION

- FOF
  - adaptive strategy
  - maladaptive

- 32–66% of stroke patients have FOF
- 26–73% suffer at least one fall 6 months post-stroke

- The two outcomes (FOF and fall risk) may be related to other shared risk factors and not causally related

METHODS

- Cross –sectional study
- Population: 302 older stroke patients
- Age >= 60
- FOF : Falls Efficacy Scale International (FES-I)
- Fall risk: Self-Rated Fall Risk Questionnaire (FRQ)
- Physical activity: the long-form International Physical Activity Questionnaire (IPAQ-LF)
- Balance: Four-Stage Balance Test (FSBT)

explained the impact of FOF on fall risk, the mediating role of balance ability, and self-imposed activity restriction.

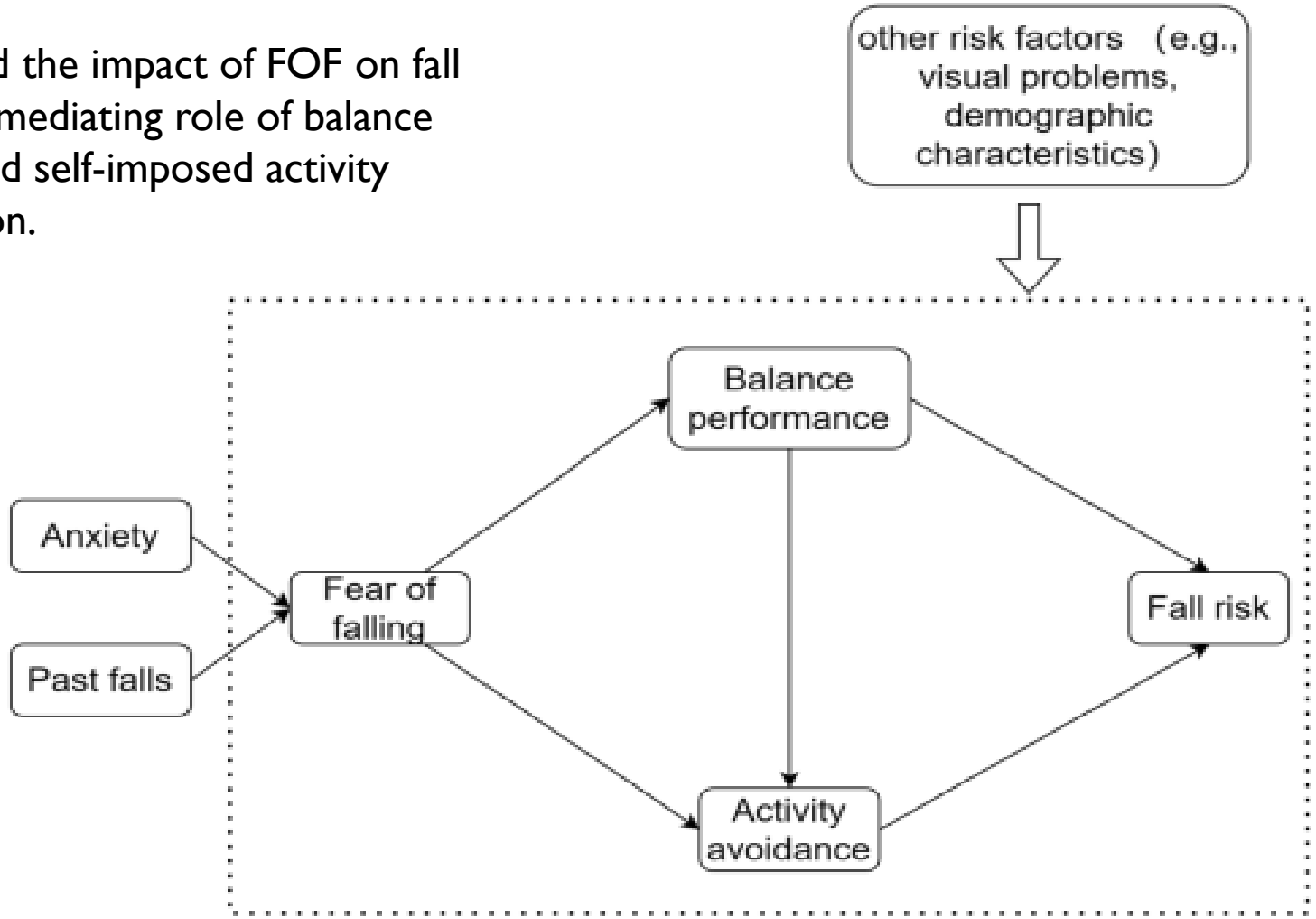


Fig. 1 Simplified theoretical framework depicting the way from fear of falling towards fall risk. Adapted from Hadjistavropoulos (2011)

1. depression as part of the mental state could significantly increase the risk of FOF in patients with stroke .
2. the difference in the compromised sides (e.g., right, left, and bilateral) might affect FOF
3. the analysis suggested that sensory difficulties such

as hearing problems were related to FOF, fall risk, and balance performance

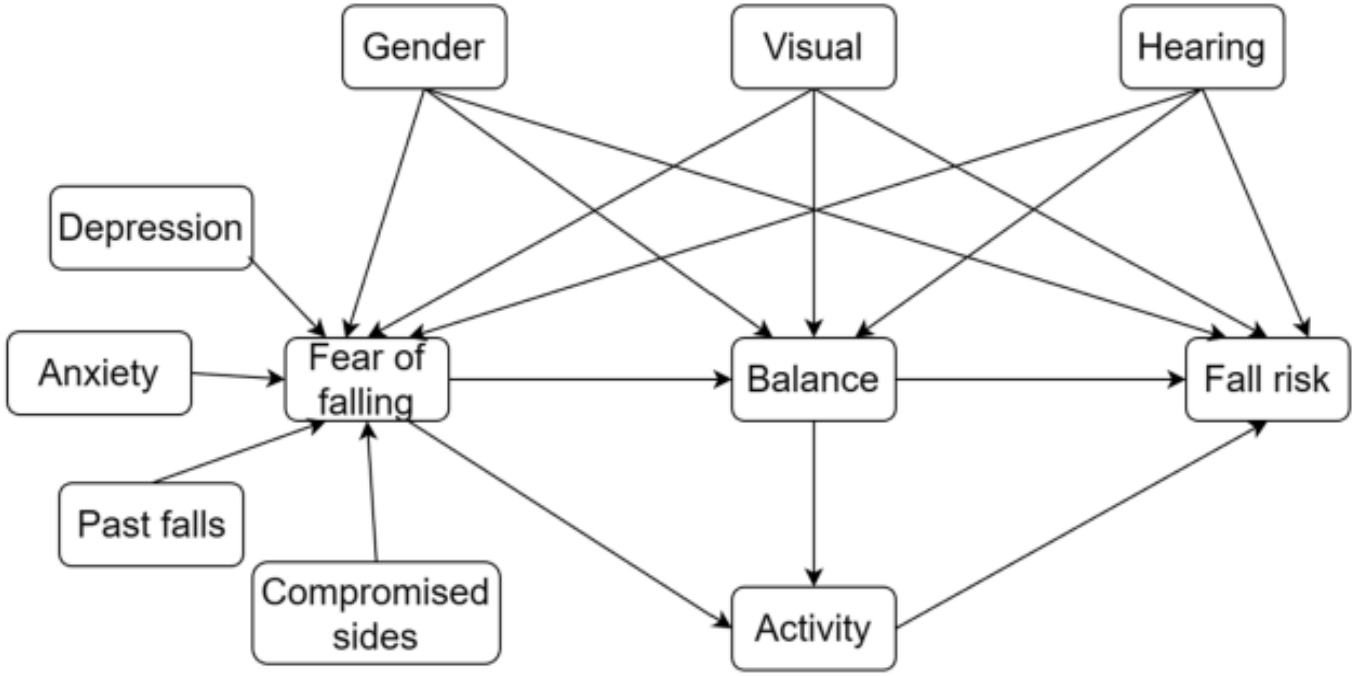


Fig. 2 The hypothesized model with fear of falling and the extension of hearing problems, compromised sides, and depression

FEAR OF FALLING

- **Fear of falling is a related but different construct from balance confidence and balance self-efficacy**
- they are all psychological indicators of balance-related confidence
- Contains 16 activities of both primary and demanding, physical and social
- Each item: four response item:
- "not all confident", "somewhat confident", "fairly confident", and "very confident", labelled as 1 to 4. The sum of the score ranges from 16 to 64 points, with a score of 16 to 19 indicating a high level of FOF, 20 to 27 indicating a moderate level of FOF, and 28 to 64 indicating a low level of FOF

PHYSICAL ACTIVITY BEHAVIOR

- **(IPAQ-LF): long-form International Physical Activity Questionnaire**
- Consist of : activities with low, moderate and high intensity;
- Activities:
  - leisure time physical activity
  - domestic and gardening activities
  - work-related physical activity
  - transport-related physical activity

✓27questions: reflect the previous seven day's activities

✓total physical activity of metabolic equivalent (MET)-minutes/week was calculated to describe the amount of exercise.

FALL RISK

- Self-Rated Fall Risk Questionnaire (FRQ)
- 12 questions: real-life risk factors of falls:
- The he score of the labels can be 0, 1 or 2
- score >= 4 : the patient is at risk

BALANCE

- Four stage balance test (FSBT)
- To maintain **4 challenging positions** without any assisting device
- each successive position became more difficult to hold.
- The position was changed every 10s, and the test ended when the subject could no longer maintain a position
- Being unable to hold the tandem stance (task number 3) for 10s indicates poor balance function

DEPRESSION

- GDS-15 :
- 15-item Geriatric Depression Scale
- Suitable for stroke patient
- the total : 0 to 15
- Score >= 8: the presence of depression

ANXIETY

- GAD-7:
- 7-item Generalized Anxiety Disorder scale
- Total score: 0-21
- 5-9: low level of anxiety
- 10-14: medium level of anxiety
- 15-21: high level of anxiety

RESULTS

- Mean age: 68.62 (SD 7.62)
- 38.4 % : female
- Mean BMI: 24.44 (SD 3.29)
- 8.94% (n=27): high FOF
- 18.21% (n=55) moderate FOF
- 72.85% (n=220) low FOF

A model of FOF for older patients with stroke was developed in the study. It illustrated the influence of physiological and psychological factors on the risk of falling. The model initially confirmed the maladaptive form of FOF and indicated the following main findings

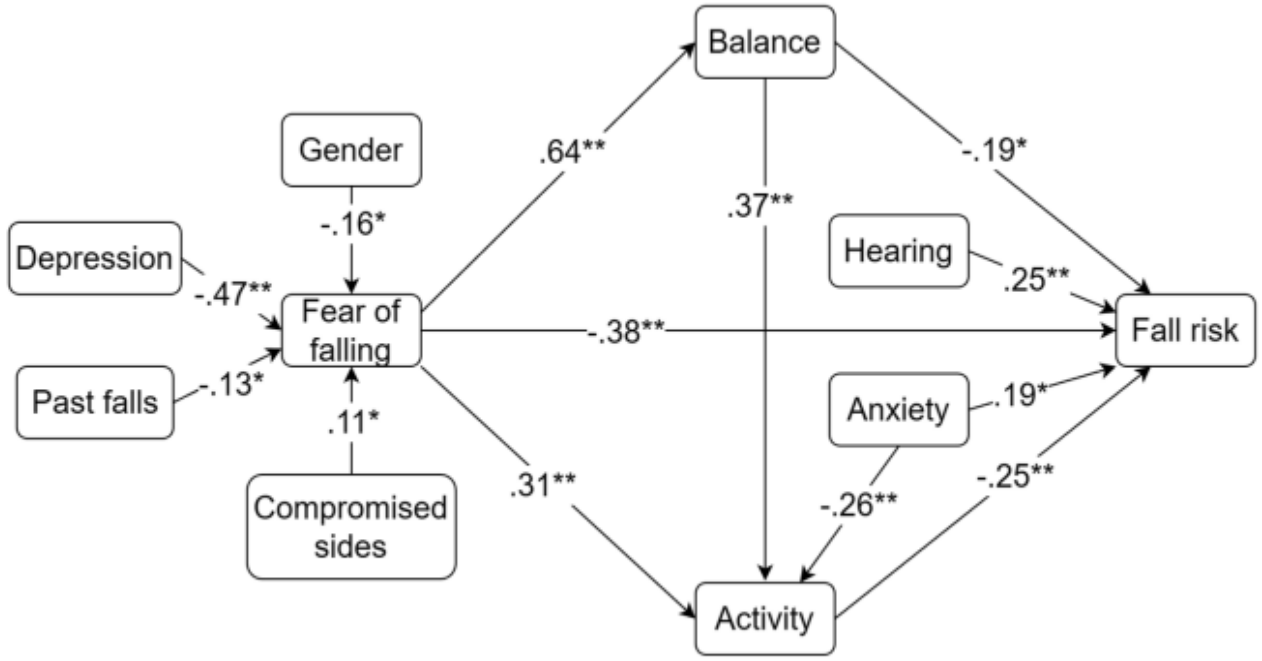
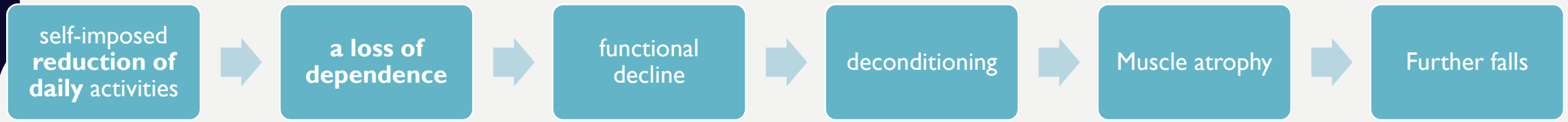


Fig. 3 The final model from the structural equation modeling predicts older stroke patients' fear of falling and fall risk using the fear of falling model. Only significant paths are shown. *$p < 0.05$, **$p < 0.001$

DISCUSSION

- **FOF directly** affected fall risk or **indirectly** affected fall risk through **balance ability and activity behavior pathways**
- FOF patients tend to adopt **sedentary lifestyles**, reducing both physical and social activities as a way to avoid falls;
- prevent falls in the **short period**, but in **the long run**:



- depression was a more critical psychological factor related to FOF instead of anxiety

DISCUSSION

- ✓**female sex, fall history, and compromised sides** were related to FOF, while neither hearing nor visual problems were associated with FOF.
- ✓**women** showed significantly **worse FOF** conditions than men
- ✓FOF in **women over 60 years** of age has been associated with factors such as **menopause**, which may generate a decrease in bone mineral mass and hormone
- ✓The **compromised sides** had a weak association with FOF, this is a controversial result and needs further study.

DISCUSSION

- When the perceptions of the danger of falling are in line with the actual balance ability, FOF itself will encourage positive, protective changes to behaviour

- *But* due to the **impaired sensory systems**, older stroke patients are more likely **to over/under-estimating** the **danger of falling**; this mismatch between perception and reality may jeopardies the adaptive side of FOF.

CONCLUSION

- **The increased risk of falling** in older stroke patients results from **a maladaptive FOF affected by depression, anxiety, past falls, poor balance, and limited activity**

- psychological factors, female gender, and fall history should be considered when tailoring interventions for older stroke patients to address falls

ANY QUESTION?

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