

Questionnaire for Falls in Elderly



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Introduction

Falls are a major public health problem in elderly population, and their consequences are a major public health problem as falls have been identified as the second leading cause of unintentional injury morbidity, accounting for 11% of the unintentional injury mortality rate globally.^{1, 2} Every year accidental falls occur in nearly one third of those aged more than 60 years, with 10% of these falls resulting in serious injury.³ Falls among the elderly can lead to disability, hospitalization, and premature death. Evaluation of the fall profile, identification of risk factors, and their impact on function are an essential part of comprehensive assessment by physiotherapist for fall prevention.⁴ Comprehensive geriatric assessment (CGA) is an iterative collaborative multidimensional framework and process of assessment used to assess people living with frailty.^{5,6} There are five domains at the centre of the CGA that form the framework for the assessment.⁷ These domains are: Physical Health and Nutritional Status, Mental and Emotional Health, Functional Status, Social and Environmental factors. There are several tools available for Geriatric assessment. The commonly utilized tool such as the Barthel Index includes 10-item ordinal scale that assesses domain of personal care and inability⁸; however, it does not evaluate the social, psychological, and environmental factors associated with falls. The Fear of Fall Avoidance questionnaire is used to assess subject's fear of doing work.⁹ The Geriatric Depression Scale is used to assess the subject's psychological status.¹⁰ Thus, each of them needs to be supplemented with other questionnaire for comprehensive geriatric assessment.

Therefore, the objective of study is to design a questionnaire that determines the Prevalence, Risk factors and Impacts of fall in elderly population and gain preliminary experience with its use.

Methodology

Generation of items for the draft questionnaire

The process commenced after a review of literature and other questionnaires relevant to the area of interest. The domains of enquiry were: Demographic Features; Living Situation; Marital Status; Fall related history in past 1year; Limitation in Basic and

Instrumental Activities of Daily Living; Behavioural Activities (Eating habits, Type of physical activities doing daily, Activities Avoiding due to Fear of Fall, use of walking Aids); General Health Status (Present health status, any condition diagnosed by health professional, Medications in past 1 year, any kind of Joint Pain, Breathing Distress, Sleeping Disorder) [Appendix 1]. The Personal Physical factors were determined using a separate physical examination form.

Amendments in the questions

The amendments for the content validity of the questionnaire were established by the physiotherapist, occupational therapist and an expert from community medicine. The expert advice from academic and clinical expert in the field included a university presentation feedback session.

Classification and Coding Legends for questionnaire

The demographic characteristics were examined in accordance with the type of responses provided. Each of the responses were given a numerical score. Questions to be answered with a yes or no response were coded as 1 and 2, respectively. Likert scale responses were coded from 1 to 5. The socio-economic status was calculated and classified as modified Kuppuswamy socioeconomic status scale (2022).

Reliability of the Questionnaire

The questionnaire was tested for internal consistency and test re-test reliability.

Internal Consistency

The Cronbach's reliability level for internal consistency of scaled items (responses on 5 point likert scale) in the questionnaire for avoidance of activities due to fear of fall was calculated on 30 subjects(21 female and 9 male). Table 2 shows that the internal consistency of the questions on activities avoided to fear of falling was excellent, with Cronbach's alpha=.951 and the item were retained in the questionnaire.

Test-retest Reliability

The Test-retest Reliability was calculated using Pearson Correlation Coefficient for two tailed hypothesis. 30 subjects responded for second interview after an interval of 10 days for test retest reliability yielding response rate of 100%. The overall Test Retest Reliability for the questionnaire using Pearson Correlation was found to be significant with $r=.812$. Demographic features such as

Age and Level of Education showed high ($r=.90-.99$) whereas Living Situation and Socioeconomic Status ($r=0.80-0.89$) showed Moderate test retest

correlation [Table 3]. The Retest correlation was quite high both for limitation of activities of daily living and the carrying out of instrumental activities of daily living [Table 3]. The Test-Retest correlation was found to be moderate for behavioural factors such as eating habits, smoking habits, alcohol consumption and psychological behaviour, and it was high for the use of assistive devices while walking [Table 3]. Questions that enquired about health-related issues or any problem that has been medically diagnosed were found to have a strong correlation [Table 3].

Table 1: Demographic features of Respondents

Demographics features	Elderly (%)
Age (Years)	
60-70	80.0%
>70	20.0%
Gender	
Male	30.0%
Female	70.0%
Marital Status	
Married	90.0%
Single	10.0%
Divorced	0.0%
Education	
Illiterate	23.3%
Less Than High School Degree	26.7%
High School Degree	10.0%
Bachelor's Degree	30.0%
Higher Degree (Masters, PhD)	10.0%
Employment Status	
Unemployed	46.7%
Retired	23.3%
Employed for wages	13.3%
Self employed	16.7%
Language Known	
English	6.7%
Hindi	53.3%
Punjabi	40.0%
Any other	0.0%
Socioeconomic status (Kuppuswamy scale 1976)	
Upper	8.0%
Upper middle	36.7%
Lower middle	40.0%
Upper lower	10.3%
Lower	5.0%

Table 2: Avoidance of Activities due to fear of falling

Activities	Test Retest Correlation (r)
Walking	.723
Lifting and Carrying weight	.862

Going up and downstairs	865
Walking on different surfaces	737
Walking in crowded places	743
Walking in unfamiliar places	750
Leaving Home	824
Getting in and out of chair	765
Showering or Bathing	888
Exercise	746
Preparing meal	852
Doing housework	757
Work/ or volunteer work	741
Recreational and leisure activities	745

Table 3: Test Retest Reliability for various variables under study

Items	Test retest correlation (r)
Age	.978
Level of education	.962
Living situation	.802
Socioeconomic status	.856
Limitation in ADL	
Feeding	.855
Bathing	.942
Grooming	.887
Dressing	1.000
Bowels	1.000
Toilet use	.784
Transfers	.867
Mobility	1.000

Limitation in IADL

Use telephone	.936
Shopping	1.000
Food preparation	.963
Housekeeping	1.000
Laundry	1.000
Mode of transport	.966
Take medicines	1.000 1.000
Ability to handle finances	1.000

Behavioural activities

Eating habit	.786
Physical activities doing daily	1.000
Leisure activities	1.000
Household	.802
Work related activities	1.000 .745
Smoking	.617
Alcoholic	.772
Psychological factors	.654

Health status

Long term condition	.707
Complaint of dizziness	.637
No of medications	.897
Joint pain	.625
Vision impairment	.737
Hearing impairment	.614
Respiratory disorders	.465
Sleeping disorders	.503

- **0.8 and above:** Very strong correlation
- **0.6 - 0.79:** Moderately strong correlation
- **0.3 - 0.59:** Fair correlation
- **Below 0.3:** Poor correlation

Discussion

The majority of respondents in the study were female, from the age group of 60-70 years, and belonged to the upper middle and lower middle categories of socioeconomic status. Nearly 46.7% were unemployed and the commonest language spoken was Hindi and Punjabi [Table 1]. Most of the subjects had history of falls in past one year. (Pothiraj et al 2019 found a fall rate (73.03%) as a significant health problem that disproportionately affected women (58.78%) and factors such as age group, education, marital status, and socioeconomic status were found to be significantly associated with fall.¹¹ In our study, reliability has been calculated using internal consistency and test-retest methods. Test Retest reliability has been considered more relevant in clinical medicine because the constructs to be measured are heterogeneous in nature as different constructs (activity limitation, physical factors, and psychological factors) in this study. The present research has demonstrated with internal consistency in the construct studies. The test-retest

method has the potential for learning, carryover, or recall effects, which undermines its reliability-checking efficacy. The majority of researchers have settled on a time frame of between two days and two weeks. The questionnaires that were administered again after 2 days or 2 weeks showed no statistically significant differences, so a 10-day interval was selected for test-retest reliability in the present study as a reasonable compromise between recollection bias and unwanted clinical change.¹² It took 20-30 minutes to complete at a pace that was comprehensible to them, as Hindi was the most widely spoken language.

The internal consistency of the questions on activities avoiding due to fear of fall was found to be excellent with Cronbach's alpha= .951. The probable reason for this could be that questions on fear of falling have been obtained from fear of fall avoidance behaviour questionnaire. The internal consistency of this scale has been found to be excellent (Cronbach's=.86 - .94).¹³

Items such as socioeconomic status, behavioural factors such as cigarette smoking, alcohol consumption, eating habits and psychological behaviour showed moderate test-retest correlation. Questions that inquired about health-related issues or any problem that has been medically diagnosed were found to have a strong correlation.

The modification that was carried out was a revision of the per capita income, and it was performed with reference to the year 2022.¹⁴ Upon interview, some modifications were felt to be made to the questionnaire such as an addition of option of long term disease diagnosed by health professional and addition of option of any other in various construct under study and Thus, the final questionnaire has been found to have acceptable internal consistency and moderate to good test-re-test reliability and is ready for use.

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APPENDIX 1

- Name: _____
- Date: _____
- Age (in _____ years):
- Gender:

Section A: Socio-Demographic features

- Male Female
- Address: _____
 - Nationality: _____
 - Marital Status:
 - Married
 - Single
 - Divorced
 - Education:
 - Illiterate
 - Less Than High School Degree
 - High School Degree
 - Bachelor's Degree (Masters, PhD)
 - Higher Degree
 - Employment Status:
 - Unemployed
 - Retired
 - Employed For Wages
 - Self-Employed
 - Living Situation:
 - Living with Family
 - Alone
 - With Friends/Relatives
 - In a Nursing Home
 - Language Known
 - English
 - Hindi
 - Punjabi
 - Any other
 - Socio-economic Status
 - What is the educational level of your family?
 - Professional degrees, PG and above

2. Graduates
3. Intermediate or past high school diploma
4. High school certificate
5. Middle school certificate
6. Primary school or literate
7. Illiterate

b. What is occupation of head of your family?

1. Legislators, Senior Officials & Managers
2. Professionals
3. Technicians and Associate Professionals
4. Clerk
5. Skilled Workers and Shop & Market Sales Workers
6. Skilled Agricultural & Fishery Workers
7. Craft & Related Trade Workers
8. Plant & Machine Operators and Assemblers
9. Elementary Occupation
10. Unemployed

c. What is the per capita income (Rs/month) of head of your family?

1. $\geq 184,376$
2. 92,191-184,370
3. 68,967-92,185
4. 46,095-68,961
5. 27,654-46,089
6. 9,232-27,648
7. ≤ 9226

Section B: Fall related history in past one year

- 1 a. Have you slipped, tripped or fallen in the past?
 - Yes
 - No
 - Cannot say

If no, go to question no. 10

b. If yes, how recently?

- In the past month
- In the past six months In the past year
- More than 1 year ago

c. If you have fallen in the past year, how many times have you fallen?

1. Single Fall 2. Recurrent Fall

2. What Was the Time of fall?

- Morning (6am-11am)
- Afternoon (12pm-4pm)
- Evening (5pm-8pm)
- Night (9pm-5am)

3. What Was Your Location of fall?

1. Inside Home 2. Outside Home

4. What Were Your Activities Preceding fall?

- Walking
- Working
- Sports
- Activities of Daily Living (Toileting, Bathing)
- Others

5. What were the Health Consequences after a fall?

- Pain
- Bruising
- Fracture
- Laceration
- Internal bleeding

6. What was the consultation you have taken after fall?

- None
- General Physician
- Orthopedician
- Neurologist
- Physiotherapist
- Ayurvedic / Homeopathic
- Any other

7. Treatment Advised by Consultant?

- Medicines
- Bed Rest
- Splint/Brace
- Walking Aid
- None

8. If bed rest then for How Long You were on rest?

- 1month
- More Than One Month
- 3 Months

9. What do you perceive the reason of fall to be?

- Sense of Dizziness/ Unsteadiness While Standing
- Generalised Weakness
- Effect of Medication
- Vision Problem
- Inadequate Footwear
- Slippery Floor
- Poor Lighting
- Balance issue
- Uneven Surfaces
- Any Other Cause
- Unknown

10. Do you feel any Limitation in your Activities of Daily Living (ADL)?

- a. FEEDING
 - Unable
 - needs help cutting, spreading butter or requires modified diet
 - Independent
- b. BATHING
 - Dependent
 - Independent (or in shower)

c. GROOMING

- needs to help with personal care
- Independent face/hair/shaving

d. DRESSING

- Dependent
- needs help but can do about half unaided
- Independent

e. BOWELS

- Incontinent, or catheterised and unable to manage alone
- Occasional accident
- Continent

f. TOILET USE

- Dependent
- needs some help, but can do something alone
- Independent (on and off, dressing, whipping g. TRANSFERS (BED TO CHAIR AND BACK)
- Unable, no sitting balance
- Major help (one or two people, physical), can sit
- Minor help (verbal or physical)
- Independent

h. MOBILITY (ON LEVEL SURFACES)

- Immobile or <45m
- Wheelchair independent, including corners, >45m
- Walks with help of one person (verbal or physical)>45m
- Independent (but may use any aid; for example, stick)>45m

i. STAIRS

- Unable
- needs help (verbal, physical, carrying aid)
- Independent

11. Do you feel any Limitation in carrying your Instrumental Activity of Daily Living (IADL)?

a. Ability to Use Telephone

- Operates telephone on own initiative-looks up and dials numbers
- Dials a few well-known numbers
- Answers telephone, but does not dial
- Does not use telephone at all

b. Shopping

- Takes care of all shopping needs independently
- Shops independently for small purchases
- Need to be accompanied on any shopping trip
- Completely unable to shop

c. Food Preparation

- Plans, prepares, and serves adequate meals independently
- Prepares adequate meals if supplied with ingredients
- Heats, serves and prepares meals, or prepares meals, or prepares meals but does not maintain adequate diet
- Needs to have meals prepared and served

d. Housekeeping

- Maintains house alone or with occasional assistance (heavy work)
- Performs light daily tasks such as dish washing, bed making
- Performs light daily tasks but cannot maintain acceptable level of cleanliness
- Needs help with all home maintenance tasks

- Does not participate in any housekeeping tasks

e. laundry

- Does personal laundry completely
- launders small items-rinses stockings, etc.
- All laundry must be done by others

f. Mode of transport

- Travels independently on public transportation or drives own car
- Arranges own travel via taxi, but does not otherwise use public transportation
- Travels on public transportation when accompanied by another
- Travel limited to taxi or automobile with assistance of another
- Does not travel at all

g. Responsibility for Own Medications

- Is responsible for taking medication in correct dosages at correct time
- Takes responsibility if medication is prepared in advance in separate dosage
- Is not capable of dispensing own medication

h. Ability to Handle Finances

- Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income
- Manages day-to-day purchases, but needs help with banking, major purchases, etc.
- Incapable of handling money

Section C: Behavioural Factors

1. What type of food do you eat?

- Milk Products
- Green Leafy Vegetables
- Fruits
- Non Vegetarian diet like Egg, Meat etc

2. How often do you take milk products?

- Daily
- Occasionally

3. What type of physical activities you are doing daily?

a. LEISURE ACTIVITY

- Sitting activities (Watching TV, Reading etc)
- Light sports and recreational activities (walking outside home for fun, Shopping etc)
- Moderate sports and recreational activities (Tennis, Badminton etc)
- Strenuous sports and recreational activities (jogging, swimming, cycling etc)
- Muscle strength activities (Lifting weight and push ups etc)

b. HOUSEHOLD ACTIVITY

- Light housework (dusting, washing dishes)
- Heavy household (vacuuming, scrubbing floors)
- Home repairs
- Outdoor gardening
- Caring for another person

c. WORK-RELATED ACTIVITY

- Paid work
- voluntary work

2. Do you have any of the following long-term conditions that have been diagnosed by a health professional?

Yes

No

- a. Arthritis or rheumatism
- b. Osteoporosis (brittle bones)
- c. High blood pressure
- d. Heart disease
- e. Cancer
- f. Diabetes
- g. Epilepsy (seizures)
- h. Parkinsonism
- i. Dementia
- j. Peripheral neuropathy: If in Lower Limb
- k. Other Neurological condition eg. Multiple sclerosis, Spinal neurological injury
- l. Vestibular disorders eg. Vestibular hypotension, Menieres. BPPV
- m. Stroke
- n. Urinary Incontinence
- o. Bowels Incontinence
- p. Hearing Impairment
- q. Vision Impairment
- Any other

3. Do you have any complaints of dizziness while doing these activities in the past one year?

Yes No

- a. Standing
- b. Walking
- c. Turning
- d. Turning the head
- e. Rolling over in bed
- f. Any other Activity

4. In the past one year did you take any of the following medications?

- Sleeping pills
- Medicine for worrying or anxiety
- Diuretics or water pills
- Medicine for blood pressure
- Medicine for the heart

- Medicine for pain
- Medicine for diabetes
- Medicines for any known medical condition _____

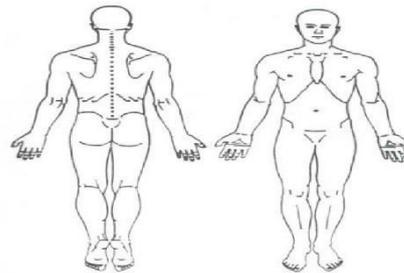
5. Number of Medications Taken Daily?

- 0
- 1-4 5-8
- More Than 8

6. Do You Have Any Kind of Joint Pain?

- Yes No If no, go to question no.16

7. If yes, Mark the area where you Feel Pain.



8. How long do you have this pain?

- 1. Since one month
- 2. Last six months
- 3. Last one year

9. How severe is your pain? (Mark on the 10 cm line)

- 1
- 10

10. What is the nature of your pain?

- 1. Stiffness
- 2. Nagging
- 3. Numbness
- 4. Tingling
- 5. Loss of strength
- 6. Cramp/Spasm
- 7. Pain
- 8. Any other

11. What do you think the cause of your pain?

- 1. Trauma/Injury
- 2. Disease
- 3. Cannot say
- 4. Any other

12. When do you feel the pain during the day?

- 1. Morning
- 2. Noon
- 3. Evening
- 4. During sleep
- 5. Whole day
- 6. Any time during day

13. Does your pain affect your ?

Activities of daily living (Bathing, Toileting, Cleaning etc)

Sleep

Appetite

14. Do you have problems with your feet?

- Painful feet including Painful corns, Arthritis
- Bunion
- Gout

- Swollen Ankles/Feet
 Toe deformity(Hammer, Mallet, Claw Toes)
 Fallen Arches

15. What was the consultation you have taken for pain?

- None
 General Physician
 Orthopaedics
 Physiotherapist
 Ayurvedic / Homeopathic
 Any other _____

16. Do you have trouble seeing objects clearly eg. Watching TV, Cracks in the footpath (Visual acuity)?

- Yes No

17. Do you have trouble judging distance eg. going down stairs, distance of car away (Depth perception)?

- Yes No

18. Do you have trouble seeing in half lighting eg. seeing larger objects, steps (Contrast sensitivity)?

- Yes No

19. Have you got your eye checkup done in previous one year?

- Yes No

20. When was the last time you had your eyeglasses updated?

21. Do you have loss of sensation (numbness, pins or needles) in the feet or legs in previous one year (somatosensory)?

- Yes No

22. Do you have any difficulty in Hearing?

- Yes No If no, go to question 25

23. Have you got your ear check up done in the previous one year?

- Yes No

24. Have you ever used a hearing aid?

- Yes No

25. Do you have difficulty in breathing or any kind of respiratory problem?

- Yes No If no, go to question 31

26. How often do you have good days (With Few Respiratory Problems)?

- No good days
 A few good days
 Most days are good

Every day is good

27. How would you describe your respiratory problems?

- Cause me a lot of problems or are the most important physical problem I have
 Cause me a few problems
 Cause no problem

28. How do your respiratory problems affect you? Please pick one response.

- They do not stop me from doing anything I would like to do
 They stop me from doing one or Two things I would like to do
 They stop me from doing most of The things I would like to do
 They stop me from doing everything I would like to do

29. Have you consulted a doctor for your problem of breath?

- Yes No

30. Does the shortness of breath get worse when you do any physical activity?

- Only get breathlessness with strenuous exercise
 Shortness of breath when hurrying on level ground or walking up a slight hill
 On level ground walk slower than people of the same age because of breathlessness
 Stop for breath after walking about 100 yards or after few minutes on level ground
 Too breathless to leave the house or breathless while dressing

31. Do you feel the urge to urinate more frequently?

- Yes No

32. Do you have any problem passing urine and bowel?

- Yes No

33. Do you take a long time to urinate?

- Yes No

34. Have you consulted a doctor for this problem?

- Yes No

35. Do you sleep well at Night?

- Yes No

36. At what time did you feel more sleepy?

- Day Night

37. If your answer is day, have you consulted a doctor for your days sleep?

- Yes No

38. If yes what does doctor prescribed?

39. What do you perceive as the reason of disturbed sleep at night?

Urine Problem

Stress

Medications

Heartburn Because Of Poor Digestion

Joint/Muscular Pain

Any Other ____