

# Perception and Preventive Measures of Falls among Rural Elderly Population in Ahmednagar (India) - An Observational Study

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**Abstract:** Background: Falls is major problem in geriatric population. In India, the main cause for incidence of falls is due to the lack of knowledge regarding falls and its prevention strategies. There are no enough studies that have fully covered perception of falls and its consequences among elderly Indian population. Objectives: 1. To determine the level of knowledge about falls. 2. To provide the information about risk factors of falls and prevention strategies. 3. To provide information about role of physiotherapy in prevention of falls. Materials and Method: An observational study was conducted on 100 participants aged above 60 years of age including both male and female in different villages of Ahmednagar district. A self-structured validated questionnaire containing 10 dichotomous answers covering all aspects of awareness and prevention related to falls was administered. Result: Graph Pad 8 software used for analysis. Descriptive statistics was carried out based on the responses from the participants. 96% of population was not completely aware but, in someway, or other they were and 4% of population was not aware of falls in any ways. Conclusion: Although the awareness about falls and its risk factors in geriatric population was there up to some extent as compared to those who were not aware about falls in any means, some gaps in knowledge still exist.

**Keywords:** Awareness, falls, prevention strategies, older adults, risk factors, physiotherapy

## 1. Introduction

Falls is ever-increasing problem amongst elderly population. In the same way, changes taking place in cognitive impairment and surrounding contribute to more possibility of falling. Falls in the elderly is a community problem leading to physical, medical, psychological, social and economic effect. Age-related changes have effect on an older person's ability to maintain balance. (1, 2) Andrew Guccione stated three ranges of biologic age groups. The young old are individuals between 65 and 75 Years of age. Individuals between the ages of 76 and 85 fall within the middle old group. The old-old group is comprised of individuals older than 85.(3)

Karim M. Khan, reviewed that there is higher risk of falling with increasing age. Hill et al. reported that falls in elderly can cause disability. Murray G et al. showed that deficits in the sensory motor system which helps in maintaining balance is the commonest cause for falls among older people. Deterioration of the visual, vestibular, somato sensory systems, reduced speed of central processing and decrease in muscle power occurs due to aging process. These changes are mostly associated with slowing of postural responses and altered movement patterns. Salkeld et al. stated that changes in the lifestyle of an older adult occurs due to fear of falling which further leads to reduced mobility and person becomes dependent. This reduces their quality of life. According to Skelton D, Todd C. elderly people who have history of fall are likely to fall again. (4)

Risk of falling increases with some underlying pathologies and health conditions like Arthritis, osteoporosis, Parkinsonism, heart disorders, Cerebrovascular Accidents

and Incontinence (5, 6, 7, 8) C. Patino et al reviewed that central and peripheral vision loss increases possibility of fall. Risk of fall increases by 2.8 times and 1.4 times due to loss of Central and Peripheral vision loss respectively. Nearly 70% of Geriatric Population who had central loss also shown peripheral loss. Most of the falls can actually be prevented by developing awareness about risk factors of falls. Geriatric Population needs to be educated about the falls prevention strategies and home modification. (4)

Balance training Programme should be implemented as it promotes ability to maintain balance during fall. (9) Efficient participation of older people in preventive strategies is necessary with correct knowledge gathering from a proper source. (10) Once they are capable of identifying the risk factors of fall they will they take preventive measures to avoid it. The awareness of risk factors is very essential for the Geriatric public so that they can take prevention to avoid the possibility of fall. (11, 12)

Falls is very serious but ignored issue in India which affects the Indian elderly population. Geriatric people are not aware about the risk factors and consequences of falls. Russell K et al. reported that it is necessary to understand the degree of awareness and its relation with fall prevention recommendations in order to plan fall prevention approaches. (13) In India, there are no enough studies or literature that has fully captured the epidemiology, etiology or impact of such falls. Hence there is a need to carry out this study to create awareness about falls and provide knowledge regarding risk factors and preventive measures among elderly in Ahmednagar.

## 2. Materials and Methodology

This was a community based observational study conducted on general elderly participants in different villages of Ahmednagar District. Sample size was calculated using OpenEpi version 3.01 and 100 samples were selected by purposive sampling technique. The study protocol was approved by Institutional Ethics committee. The questionnaire was self-structured covering all aspects of awareness and prevention related to falls. A pilot study was conducted to validate this questionnaire on a group of 10 respondents. Geriatric Mobile Falls Clinic set-up was done by Vikhe Patil Physiotherapy Department in few villages in Ahmednagar district – Dehere, Jeur, Shendi, Parner, Rahuri, Nepti. Written consent was obtained. Inclusion criteria was elderly participants of age more than 60 years, both male and female who were visiting our Geriatric Falls Clinic through Flyers distributed in villages by Social worker. Individuals who did not wish to participate in study, severe mental illness, visual or hearing disability that may interfere with answering were excluded. Participants were selected by convenient sampling method. Study was conducted between February 2018 to July 2018. Following completion of the survey, participants were provided with the correct information regarding risk factors of falls as well as they will be made aware about the role of physiotherapy and its importance in prevention of falls.

## 3. Data Collection

### Outcome Measure: Questionnaire for Falls Perception in elderly

- 1) Questionnaire was given to every participant and they were asked to answer the given questions
- 2) If any individual was not able to read, then the investigator read out the questions and participant answered it.
- 3) This questionnaire was structured to know the perception of geriatric population regarding the issue of falls, risk factors and its prevention.
- 4) Questionnaire was first structured in English language and later converted to Local language of Ahmednagar i.e. Marathi.
- 5) It contains 10 questions having dichotomous answers (Yes or No) related to seriousness of falls among geriatric individuals, risk factors, prevention measures to avoid the possibility of falls and role of physiotherapy in management.

### The questionnaire was subdivided into:

- 1) Demographic data (living area, age, gender, educational level).
- 2) Experience regarding falls (Did you suffer falls or know someone who suffered falls, how do you rate your knowledge about falls). This part was added to make sure that personal experience is used as a co-variant in analysis to exclude it as a confounder.
- 3) Questions regarding intrinsic & extrinsic factors which causes fall and prevention of falls included 2 options – Yes or No, so the participant can choose from them; ‘Yes’ as answer to that particular question was considered as being aware of that respective component.
- 4) Question regarding falls being a serious disease in elderly just like other diseases was asked; anyone who

answered Yes was considered as being aware about seriousness of falls.

- 5) Question regarding the awareness about risk factors of falls was included in which the respondent has to respond the answer as Yes, by which he/she will be considered as aware about this component.
- 6) Question regarding changes that take place in elderly person which leads to more chances of falls as compared to younger people was added, to which the respondent has to respond the answer as Yes, by which he/she will be considered as aware about this component.
- 7) Question regarding knowledge of health conditions that causes fall was asked, anyone who answered Yes was considered as aware about it.
- 8) Question about visiting a doctor in a case of fall was added to the questionnaire to understand how much they are aware of such medical emergency.
- 9) Question regarding their use of any preventive measure was asked to understand their awareness to avoid the incidence of fall.
- 10) Question regarding arrangement and placement of furniture that causes possibility of indoor fall was added to understand their knowledge about this particular component.
- 11) Question regarding increased chances of outdoor falls than indoor falls was asked to know their awareness about this component.
- 12) Question regarding role of physiotherapy in treatment of falls was added to rule out the awareness in people about physiotherapy.

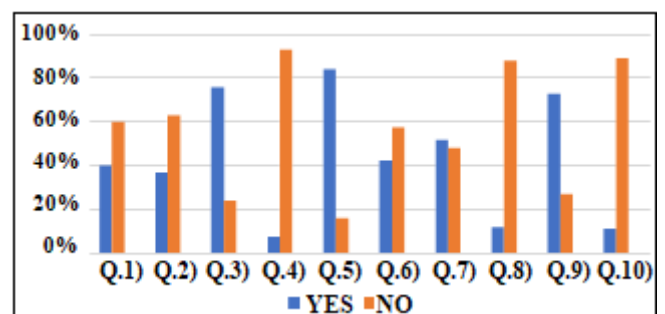
### Data Analysis

Graph Pad 8 software was used for analysis at the end of the study. Descriptive analysis of the data was carried out percentage wise based on the responses from the participants and different components of the questionnaire.

## 4. Results

**Table 1:** Awareness of falls in elderly (%) (n= 100)

Sr.no.	% (YES)	% (NO)
1.	40%	60%
2.	37%	63%
3.	76%	24%
4.	7%	93%
5.	84%	16%
6.	42.42%	57.57%
7.	52%	48%
8.	12%	88%
9.	73%	27%
10.	11%	89%



**Figure 1:** Graphical representation Demographic Data

Gender wise – Awareness of falls in elderly (%)

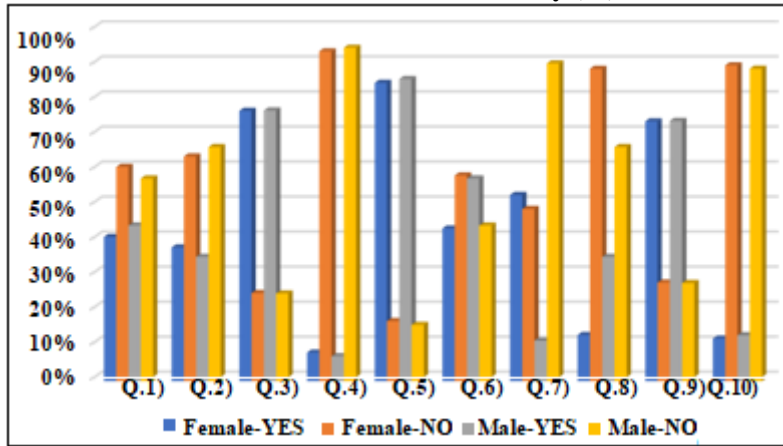
**Table 2 (a): Female (n=33)**

Sr.no.	% (YES)	% (NO)
1.	40%	60%
2.	37%	63%
3.	76%	24%
4.	7%	93%
5.	84%	16%
6.	42.42%	57.57%
7.	52%	48%
8.	12%	88%
9.	73%	27%
10.	11%	89%

**Table 2 (b): Male (n=67)**

S. No.	% (YES)	% (NO)
1.	43.28%	56.71%
2.	34.32%	65.67%
3.	76.11%	23.88%
4.	5.97%	94.02%
5.	85.07%	14.92%
6.	56.71%	43.28%
7.	10.44%	89.55%
8.	34.32%	65.67%
9.	73.13%	26.86%
10.	11.94%	88.05%

**No. of awareness of falls in elderly (%)**



**Figure 2:** Graphical representation of gender wise awareness of falls in elderly (%)

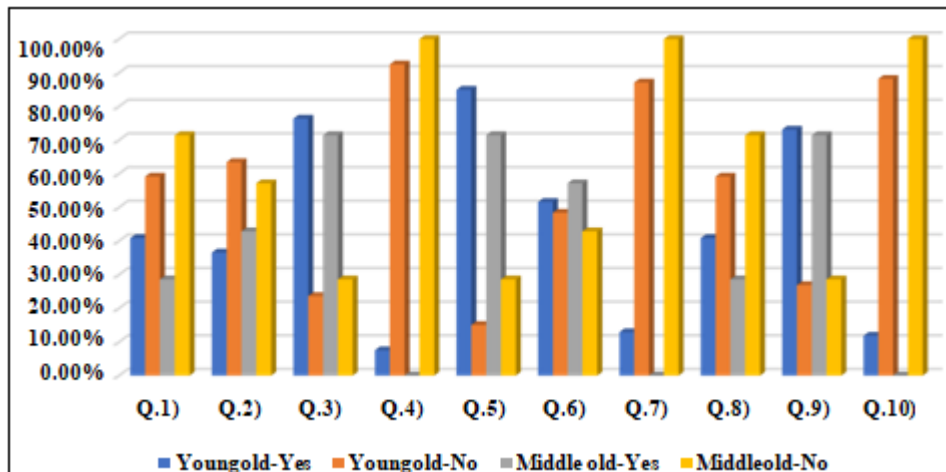
Age Wise: Awareness of falls in elderly (%)

**Table 3 (a): Young old (n=93)**

Sr. no.	% (YES)	% (NO)
1.	40.86%	59.13%
2.	36.55%	63.44%
3.	76.34%	23.65%
4.	7.52%	92.47%
5.	84.94%	15.03%
6.	51.61%	48.38%
7.	12.90%	87.09%
8.	40.86%	59.13%
9.	73.11%	26.88%
10.	11.82%	88.17%

**Table 3 (b): Middle old (n =7)**

Sr. no.	% (YES)	% (NO)
1.	28.57%	71.42%
2.	42.85%	57.14%
3.	71.42%	28.57%
4.	0%	100%
5.	71.42%	28.57%
6.	57.14%	42.85%
7.	0%	100%
8.	28.57%	71.42%
9.	71.42%	28.57%
10.	0%	100%



**Figure 3:** Graphical representation - Age wise awareness of falls in elderly (%)

Educational level wise: Awareness of falls in elderly (%)

Table 4 (a): Illiterate (n=56)

Sr. no.	% (YES)	% (NO)
1.	33.92%	66.07%
2.	35.71%	64.28%
3.	75%	25%
4.	7.14%	92.85%
5.	82.14%	17.85%
6.	48.21%	51.78%
7.	14.28%	85.71%
8.	41.07%	58.92%
9.	69.64%	30.35%
10.	10.71%	89.28%

Table 4 (b): Primary (1<sup>st</sup> to 5<sup>th</sup> std.) n =21

Sr. no.	% (YES)	% (NO)
1.	42.85%	57.14%
2.	28.57%	71.42%
3.	80.95%	19.04%
4.	4.76%	95.23%
5.	85.71%	14.28%
6.	61.90%	38.09%
7.	14.28%	85.71%
8.	38.09%	61.09%
9.	85.71%	14.28%
10.	9.52%	90.47%

Table 4 (c): Secondary (6<sup>th</sup> to 10<sup>th</sup> std.) n=18

Sr. no.	% (YES)	% (NO)
1.	55.55%	44.44%
2.	50%	50%
3.	83.33%	16.66%
4.	11.11%	88.88%
5.	88.88%	11.11%
6.	44.44%	55.55%
7.	0%	100%
8.	38.88%	61.11%
9.	77.77%	22.22%
10.	5.55%	94.44%

Table 4 (d): Higher Secondary (11<sup>th</sup>, 12<sup>th</sup> & above) n =5

Sr. no.	% (YES)	% (NO)
1.	40%	60%
2.	40%	60%
3.	40%	60%
4.	0%	100%
5.	80%	20%
6.	80%	20%
7.	20%	80%
8.	40%	60%
9.	40%	60%
10.	40%	60%

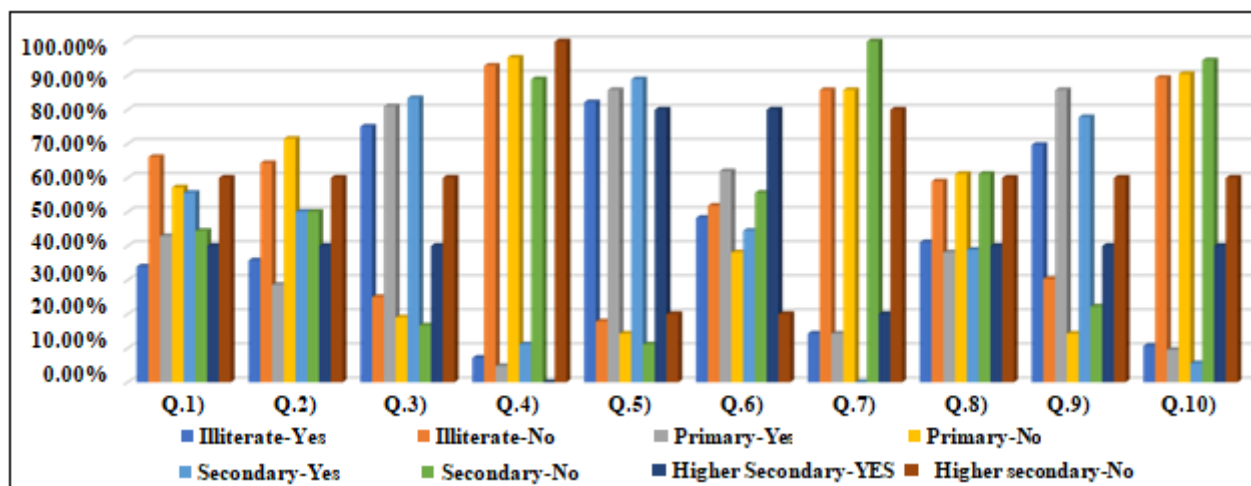


Figure 4: Graphical representation - Educational level wise: Awareness of falls in elderly (%)

5. Discussion

This study reports awareness about falls, its risk factors, preventive measures and related physiotherapy treatment among geriatric population visiting our mobile falls clinic set-up in different villages throughout the district. In this study 96% of population is not having complete awareness but, in some way, or other they have and 4% of population is not aware of falls in any ways. Gutta S et al. reviewed poor knowledge of Indian elderly people related to falls and its preventive strategies through another cross-sectional study conducted in South India which is consistent with our study.<sup>(14)</sup>

In our study a total of 95 respondents were aware about falls in some way or the other, 1% were completely aware and 4 % were completely unaware. 37% were aware of the risk factors of falls while 63% were unaware. 76% of the

respondents were aware about changes that take place in elderly which lead to more possibility of fall as compared to younger people while 24% were unaware of these changes. Only 7% geriatric population were aware about certain health conditions that causes fall due to loss of balance and 93% were completely unaware of this fact. 84% population agreed to visit a doctor if they suffer fall or visited a doctor after a fall 16% respondent refused to visit a doctor after they suffer fall. 42.42% respondents said Yes that they take preventive measures to avoid chances of fall while 57.57% said no when they were asked about taking any preventive measures to avoid fall.

In one of the previous study which support our findings, it was understood that most of the older people knows the external factors causing fall but they ignore the environmental hazards. For example, one participant said he knows that the carpet on his floor makes him lose balance but he uses it as he likes that carpet. However, they knew

some internal factors which causes fall like chronic conditions due to back or knee pain or age related physiological changes.<sup>(15)</sup> (P Morsch et al. 2016). In our study, 52% population was aware of indoor falls due to arrangement and placement of furniture while 48% were unaware. 12% of the respondents were aware of the fact that possibility of outdoor falls is more as compare to indoor fall while 88% of the respondents were unaware. 73% respondents think that only medicine can prevent them from falling while 27% respondents think only medicine cannot help. 11% respondents are aware of the importance of Physiotherapy in prevention of falls while 89% were completely unaware. Prevalence of falls increases by 50% due to home hazards. However, Cesari et al. suggest that the home modification should be in combination with the prevention of intrinsic risk factors, because they alone seem to be insufficient to prevent falls, because of its diverse nature. This demonstrates necessity for an appropriate information on fall prevention and risk factors, also considering that older adults appear to be giving less importance to intrinsic risk factors.<sup>(16,17)</sup>

% respondents gave mixed reviews as they answered Yes for the use of only medicine as a preventive measure and then answered Yes for Physiotherapy treatment as prevention to avoid falls. Later they changed their view as medicine and Physiotherapy both are the essential Preventive measures to be taken. Majority of the Geriatric people, even after being aware of the fact that changes which takes place in elderly person leads to more chances of fall than younger person and risk factors that cause indoor falls were not following any preventivemeasures.

However, in our study out of total 100 respondents 33% were female & 67% were male. Pohl P et al suggested that, concept of fall prevention program and their wish to participate in it differs in women and men. However, gender differences in relation to risk awareness and risk-taking behaviour tend to decrease with increasing age.<sup>(18-22)</sup> The awareness about risk factors, health conditions provoking possibility of falls and factors responsible for indoor falls and more chances of out door falls than indoor falls were more in females than males while awareness about falls being a serious problem in elderly just like other diseases, certain changes taking place in elderly person causing more chances of falls than younger person, visiting a doctor after suffering a fall and physiotherapy as prevention was more in males than female. Awareness about changes taking place in elderly person which increases the chances of fall as compared to younger person and response to medicine being the only prevention to avoid falls was almost similar in both Genders.

Through discussion we came to know that awareness about visiting a doctor after suffering fall was more in males because females try to avoid visiting doctor due to expenses. And so, they have developed a careless attitude towards themselves. Due to this reason, awareness about preventive measures was also less in females. Awareness about more chances of indoor falls due to placement and arrangement of furniture was more in females as they have experience about such possibility of indoor fall while performing daily household chores. Males were having awareness about more

components from our questionnaire than females. When we classified the results according to age, we considered individuals with age between 60 to 75 years as young old, individuals with age between 76 to 85 years as middle old and individuals above the age of 86 years as old – old. Out of total 100 respondents 93% were from the young old age group and 7% from middle old age group and old – old age group had no any individual from our study. Reason behind this is that individuals who fall into old– old age group are already undergoing the adverse effects of aging due to lack of knowledge regarding care to be taken to prevent fall and are not able to visit our Falls Clinic.

Hence, preventive measures should be taught when an individual is in young old age group.

Also, Yardley et al. (2006) who found that awareness of individual risk is also an important factor for fall prevention, but many older adults may not consider their own fall-risk levels. Previous research shows that although older adults may understand the risk of falling, they underestimate their own susceptibility to fall, confident that, even if they fell, they would be able to return to their current living situations (Braun, 1998). This lack of awareness of fall risk has not been acknowledged as a self-risk that might motivate change in behaviour.<sup>(15,25)</sup> P Pohl et al showed that the fall risk awareness process should be began and can include precautions as well as various preventive measures. There are many ways to make older people understand about falls prevention strategies. This study gives holistic approach to understand older persons perception about risk of fall and preventivemeasures.

<sup>(18)</sup> Morsch P et al. stated an efficient participation of an elderly in fall prevention program occurs when provided an accurate information to them.<sup>(26)</sup> Hence, we educated the geriatric population through establishing mobile Falls Clinic in different villages in Ahmednagar. We circulated pamphlets among our subjects which included prevention measure to be taken during daily activities, home modification to be done as prevention and physiotherapy treatment to deal with their fear of fall.

Despite significant results, this study has some limitations which include small sample size, inability to generalize the results. Also, the study had less female than male. We suggest to carry future studies on large number of population to explore more about perception of falls amongst Indian population and create awareness about the fall prevention program among elderly population.

## 6. Conclusion

This study concluded that although the awareness about falls and its risk factors in geriatric population was there upto some extent as compared to those who were not aware about falls in any means, some gaps in knowledge still exist. A number of individuals were aware of falls in some way or other but were not aware about the preventive measures and related physiotherapy treatment. Therefore, awareness should be made necessarily during young old age. Also, it is very essential to create awareness in illiterate geriatric population.

## 7. Acknowledgement

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### Conflicts of Interest

The authors report no potential conflicts of interest in this work.

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