



KNOWLEDGE, ATTITUDE, AND PRACTICE ON FALL RISK FACTORS AND FALL PREVENTION AMONG COMMUNITY-DWELLING MIDDLE-AGED AND OLDER ADULTS IN CHAROTAR REGION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Falls are a significant health problem among middle-aged and older adults, contributing to injury, disability, and decreased quality of life. Knowledge, attitude, and practice related to fall prevention are important in reducing fall risk.

Aim: The study aimed to assess and compare fall risk assessment, knowledge of fall risk factors, attitude toward fall prevention, and practice on fall prevention between middle-aged and older adults in Charotar region.

Method: A cross-sectional comparative study was conducted among 200 community-dwelling adults from the Charotar region, comprising 100 middle-aged adults (45-59 years) and 100 older adults (≥ 60 years) selected through purposive sampling. Data were collected using a structured questionnaire along with standardized tools to assess knowledge, attitude, practice, and fall risk. Data were analyzed using SPSS. An independent t-test assuming unequal variances was used to compare the mean scores between the two groups. Statistical significance was set at $p < 0.05$.

Result: Significant differences were found for all variables ($p < 0.05$). Older Adults had higher Fall Risk (6.98 ± 3.76 vs 2.75 ± 2.98), better Knowledge (22.88 ± 5.36 vs 21.21 ± 5.87), more positive Attitudes (87.84 ± 7.84 vs 85.32 ± 9.55), and better Practice (10.25 ± 2.66 vs 7.57 ± 4.10) than Middle-Aged adults.

Conclusion: Significant differences exist in knowledge, attitude, practice, and fall risk between middle-aged and older adults in the Charotar region. The findings highlight the need for targeted health education programs to improve awareness and preventive practices among both groups.

Keywords: Knowledge, Attitude, Practice, Fall Risk, Fall Prevention, Middle-aged Adults, Older Adults, Charotar Region, Cross-sectional Study

INTRODUCTION

In India, falls constitute a significant public health burden among middle-aged and older persons, resulting in morbidity, disability, and a lower quality of life as the population ages ^(1,2). Falls are the second most common cause of unintentional injury deaths worldwide (about 680,000 per year), with over 80% of these deaths happening in low- and middle-income nations ^(3,4). Fall risk increases with age: 32–42% of persons over 70 and 28–35% of those over 65 report at least one fall per year ⁽⁵⁾. Approximately 30% of persons over 65 who live in communities worldwide experience falls every year ^(2,6,7). Home hazards, polypharmacy, chronic

sickness, and age-related decreases are important dangers^(8,9). Consequences include fractures, fear of falling, and increased expenses; prevention measures include home safety, exercise, medication review, and vitamin D^(4,9,10,11).

In India, there is limited community-based evidence on Knowledge, Attitude, and Practice (KAP) regarding fall risk and prevention among middle-aged and older adults. Therefore, this cross-sectional study aims to assess KAP regarding fall risk factors and prevention among community-dwelling middle-aged and older adults in the Charotar region to inform targeted, culturally appropriate interventions.

METHODOLOGY

Study Design: Cross-sectional study

Study Setting: Charotar Region (community)

Sampling Method: Convenient sampling

Sample Size: 196 (Middle aged (45-65 years) group=98, Older adults (≥65 years) group=98) (Considering as a 5% to 10% drop out)

• The sample size (n) is calculated according to the formula:

$$n = Z^2 \times p \times (1-p) / e^2$$

Where: n = Sample Size

Z = 1.96 for 95% Confidence Interval

p = Expected proportion 5% (0.5)

e = Margin of error 7% (0.07)

Eligibility Criteria: (Same for both groups)

Inclusion criteria:

- Indian citizen.
- Age: ≥ 45 years
- Who able to read and understand English language.

Exclusion Criteria:

- People who were unable to walk and bedridden.
- Age: < 45 years
- Disagree to participate in the study.
- People who have cognitive impairment.

Data collection tools:

1. Data collection form
2. Fall questionnaire

1. Data collection form: The socio-demographic details of the participants include name, age, gender, address, and contact number, occupation, self-reported health behavior and Living arrangement.

The next section is General Information Related to Falls. The first question asks whether the participant has had a history of falls in the last 12 months with Yes/No options. If yes, a sub-question follows to record the number of times they have fallen, ranging from 1 to 10. The second question is about the use of assistive devices. If the participant answers yes, they are asked to specify the type of device used. For better clarity, pictures of three types of devices are provided: cane/stick, walker, and crutches.

2. Fall questionnaire: The self-administered fall questionnaire consisted of four domains: 1) Fall risk assessment, 2) Knowledge of risk factors of falls, 3) Attitudes toward fall prevention, 4) practice on fall prevention.

The questionnaire in English language has been developed using Centers for Disease Control and Prevention (CDC)-2017 instrument^(11,12) and existing literature^(4,13). Expert opinions were taken from physicians, public health professionals, physiotherapists, language experts, and social scientists. It was then translated into Gujarati and validated by experts. Pilot testing was carried out with 10 participants, and required changes were incorporated based on the results. The face validity of the tool was confirmed through expert review and the pilot study.

Data collection procedure:

A total of 220 participants were screened. Eight with cognitive impairment were excluded. The remaining 212 were recruited by convenient sampling from the Charotar region and divided equally into Middle-Aged (n=106) and Older Adult (n=106) groups. After 6 dropouts from each group due to incomplete questionnaires, 100 participants per group were included in the final analysis. Recruitment was done from community settings like senior meetings, health camps, and spiritual gatherings. Interviews were conducted in a private space after obtaining informed consent and lasted 30–40 minutes.

Fall Risk Assessment: CDC 2017, 12-item tool. Score ≥ 4 indicated risk⁽¹²⁾.

Knowledge of Fall Risk Factors: 14-item questionnaire, score 0–38. Classified as Poor (0–18), Fair (19–28), Excellent (29–38).

Attitude Toward Fall Prevention: 26-item HBM-based Likert scale, score 26–130. Categorized as Negative (26–64), Neutral (65–97), Positive (98–130).

Practice on Fall Prevention: 14-item checklist, score 0–14. Classified as Poor (0–6), Fair (7–10), Good (11–14).

RESULTS

Demographic Details and General Information

Table 1 shows the demographic details of the study participants. The mean age $\pm$ standard deviation of participants in the middle-age group was 53.47 ± 5.60 years, whereas in the older adult group it was 76.07 ± 6.66 years.

Middle-Age Group n=100 (100%)			Older Adult Group n=100 (100%)		
Characteristics	Frequency	Percentage	Characteristics	Frequency	Percentage
Age (Years)			Age (Years)		
(Mean $\pm$ SD)	53.47 $\pm$ 5.60		(Mean $\pm$ SD)	76.07 $\pm$ 6.66	
45-60	16	16%	66-70	25	25%
61-65	83	83%	71-75	25	25%
			76-80	25	25%
			81-85	16	16%
			86-90	7	7%
			>90	2	2%
GENDER			GENDER		
Male	50	50%	Male	60	60%
Female	50	50%	Female	40	40%

Table 1 Demographic Characteristics

Characteristics	Middle-Age Group n=100 (100%)		Older Adult Group n=100 (100%)	
	Frequency	Percentage	Frequency	Percentage
Marital Status				
Unmarried	0	0%	7	7%
Married	97	97%	49	49%
Divorced	1	1%	4	4%
Widow	1	1%	15	15%
Widower	1	1%	25	25%
Education Level				
Illiteracy	5	5%	17	17%
Primary Education	30	30%	21	21%
Secondary Education	20	20%	15	15%
High School Education	21	21%	14	14%
Graduation	16	16%	22	22%
Post Graduation & Above	8	8%	11	11%
Occupation				
Employed	16	16%	1	1%
Retired	7	7%	53	53%
Private Business	35	35%	11	11%
Housewife	42	42%	35	35%
Self-Report / Health Behaviour				
Alcohol Use	3	3%	2	2%
Tabacco Smoking	20	20%	22	22%
Physical Exercise	1	1%	27	27%
None of The Above	76	76%	49	49%
Living Arrangement				
Living with Family	99	99%	83	83%
Living Alone	1	1%	4	4%
Other	0	0%	13	13%

Table 2 summarizes participants' fall history and use of assistive devices. Over the past 12 months, 17% of middle-aged adults and 34% of older adults reported experiencing a fall. A single fall was the most commonly reported in both groups, reported by 7% of middle-aged and 9% of older adults. Regarding assistive device use, only 2% of middle-aged participants used one, compared to 56% of older adults. Among older adults, cane/stick was the most frequently used device (40%), followed by walker (13%) and crutches (3%). In the middle-aged group, only 2% reported using a cane/stick.

Table 2 General Information's of Participants

Bio-demographic data	Middle-Age Group n=100 (100%)		Older Adult Group n=100 (100%)	
	Frequency	Percentage	Frequency	Percentage
Do you have a history of falls in the last 12 months?				
Yes	17	17%	34	34%
No	83	83%	66	66%
If yes, how many times have you fallen?				
1	7	7%	9	9%
2	7	7%	17	17%
3	1	1%	6	6%
4	1	0%	1	1%
5	0	0%	0	0%
6	0	0%	0	0%
7	1	1%	0	0%
8	1	0%	1	1%
Do you use assistive device?				
Yes	2	2%	56	56%
No	98	98%	44	44%
If yes, then which assistive device you use?				
Cane / Stick	2	2%	40	40%
Walker	0	0%	13	13%
Crutches	0	0%	3	3%

Fall Risk Assessment

Figure 1 show the fall risk assessment of participants. Using a cut-off score of ≥ 4 , (Frequency and % both are same). Thus, older adults had a significantly higher risk of falling compared to middle-age participants.

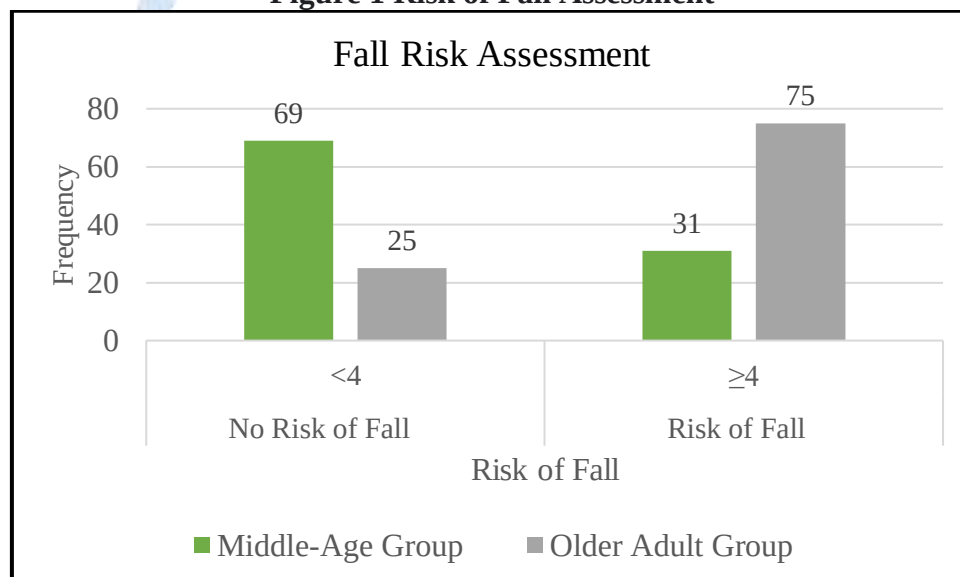
Figure 1 Risk of Fall Assessment**Knowledge of Risk Factors of Falls**

Figure 2 depict that fair knowledge of fall risk factors was the most common category in both groups, reported by 49% of middle-age and 66% of older adult participants. Thus, older adults demonstrated somewhat better knowledge than their middle-age counterparts (Frequency and % both are same). Table 1 presents responses

to 14 knowledge questions on fall risk factors. Older adults had higher correct response rates than middle-age participants in most areas.

Figure 2 Level of knowledge about Risk Factors of Falls

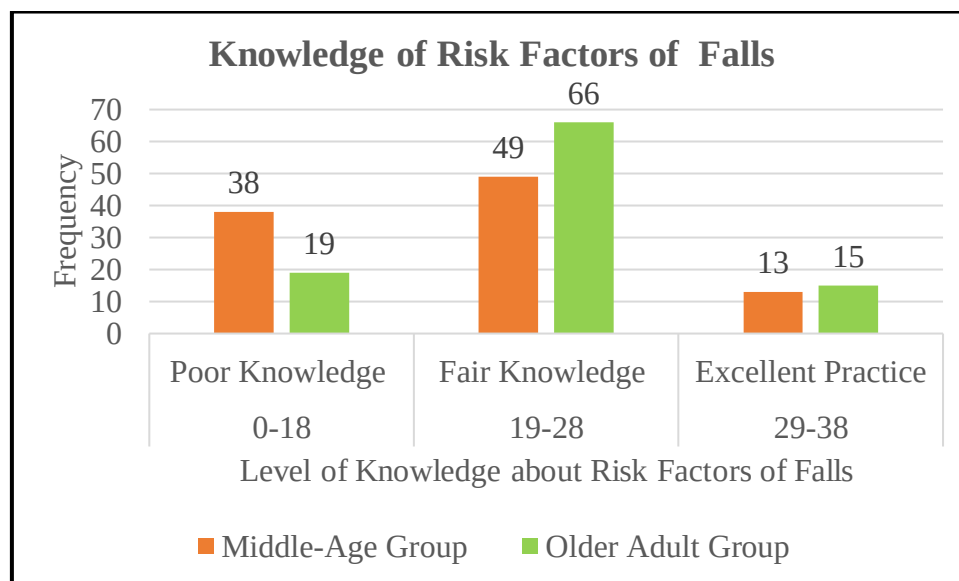


Table 1 Participants Response to the Level of knowledge about Risk Factors of Falls Questionnaire

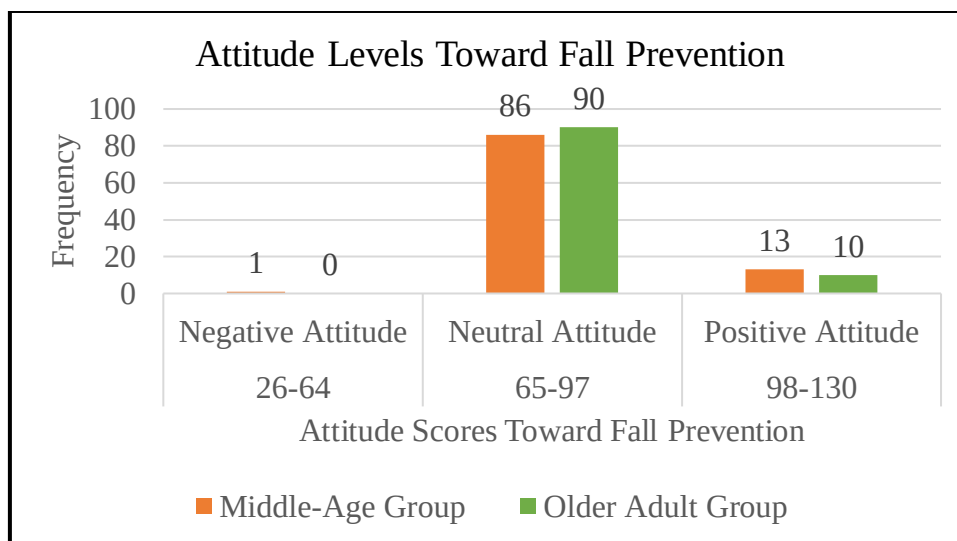
No.	Questions	Middle-Age Group n=100 (100%)		Older Adult Group n=100 (100%)	
		Correct n (%)	Incorrect n (%)	Correct n (%)	Incorrect n (%)
1	Older age increases a person's risk of falling.	95 (95%)	5 (5%)	98 (98%)	2 (2%)
2	The following may increase an older adult's chance of falling:				
a)	Bunions	8 (8%)	92 (92%)	11 (11%)	89 (89%)
b)	Balance problem	79 (79%)	21 (21%)	88 (88%)	12 (12%)
c)	Feeling dizzy	93 (93%)	7 (7%)	100 (100%)	0 (0%)
d)	Limping or difficulty walking	62 (62%)	38 (38%)	56 (56%)	44 (44%)
e)	Weak legs	48 (48%)	52 (52%)	35 (35%)	65 (65%)
f)	Standing on a stool	85 (85%)	15 (15%)	89 (89%)	11 (11%)
g)	Being sick with a cold	20 (20%)	80 (80%)	16 (16%)	84 (84%)
h)	Feeling tired or fatigued	54 (54%)	46 (46%)	65 (65%)	35 (35%)
3	Health problems like Alzheimer's disease affect an older adult's chance of falling.	37 (37%)	63 (63%)	34 (34%)	66 (66%)

4	Having had a stroke affects an older adult's chance of falling.	88 (88%)	11 (11%)	88 (88%)	12 (12%)
5	Being deaf increases an older adult's chance of falling.	22 (22%)	78 (78%)	16 (16%)	84 (84%)
6	Ear problems such as vertigo or ear infections affect an older adult's chance of falling.	59 (59%)	41 (41%)	74 (74%)	26 (26%)
7	The risk of falling is increased by drinking alcohol.	97 (97%)	2 (2%)	99 (99%)	1 (1%)
8	The following medication may increase an older adult's chance of falling:				
a)	Medicines that treat anxiety	11 (11%)	89 (89%)	24 (24%)	76 (76%)
b)	Medicines to help with sleeping	55 (55%)	45 (45%)	67 (67%)	33 (33%)
c)	Water pills	16 (16%)	84 (84%)	17 (17%)	83 (83%)
d)	Medicines that help your mood	10 (10%)	90 (90%)	16 (16%)	84 (84%)
e)	Tranquilizers or nerve pills for symptoms such as hallucinations	39 (39%)	61 (61%)	44 (44%)	56 (56%)
f)	Medicines to lower blood pressure	65 (65%)	35 (35%)	84 (84%)	16 (16%)
9	Taking more than one medications may increases an older adult's chance of falling.	38 (38%)	62 (62%)	49 (49%)	51 (51%)
10	Difficulty controlling bladder or bowels may lead to falls.	40 (40%)	60 (60%)	42 (42%)	58 (58%)
11	Being concerned about falling may increase the likelihood of an older adult falling.	71 (71%)	29 (29%)	81 (81%)	19 (19%)
12	Older adults are more likely to fall than younger adults.	84 (84%)	16 (16%)	92 (92%)	8 (8%)
13	Proper footwear helps prevent falls.	47 (47%)	53 (53%)	45 (45%)	55 (55%)
14	Eye checkups help prevent falls.	60 (60%)	40 (40%)	70 (70%)	30 (30%)

Attitudes Toward Fall Prevention

Figure 3 The majority of both middle-aged and older adults had a neutral attitude, accounting for 86% (n=86) and 90% (n=90) respectively. A positive attitude was observed among 13% (n=13) of middle-aged adults and 10% (n=10) of older adults. Negative attitude was found only among 1% (n=1) of middle-aged adults, while none of the older adults had a negative attitude.

Figure 3 Attitude Levels Toward Fall Prevention



Practice on Fall Prevention

Figure 4 indicates fair practice was most common. Middle-aged: 49% poor, 24% fair, 27% good. Older adults: 5% poor, 48% fair, 47% good. Older adults demonstrated better fall prevention practice. Table 2 further shows older adults had better practice across most of the 14 questionnaire items.

Figure 4 Practice on Fall Prevention

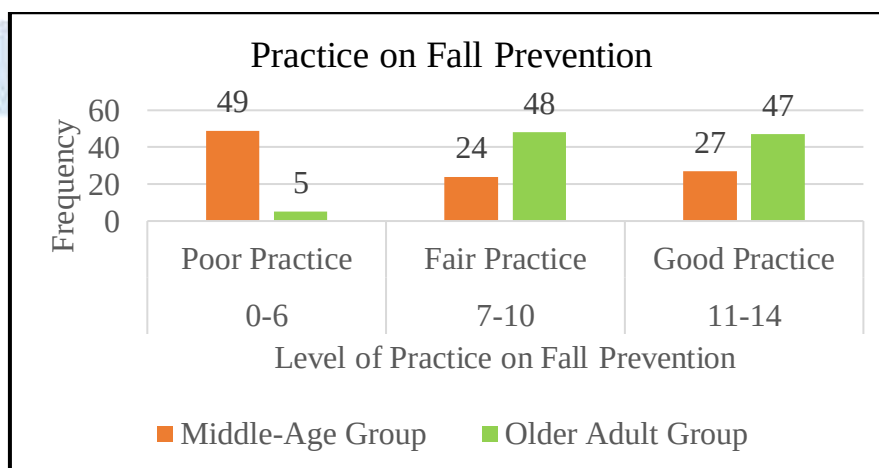


Table 2 Responses of Participants to the Fall Prevention Practice Questionnaire

No.	Questions	Middle-Age Group n=100 (100%)		Older Adult Group n=100 (100%)	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
1	Remove obstacle such a papers, books, clothing, and footwear from stairs and frequently traveled places.	68 (68%)	32 (32%)	93 (93%)	7 (7%)

2	Use non-slips mats, or fix carpets so as not slip, do not spread loose mats in the house.	96 (96%)	4 (4%)	98 (98%)	2 (2%)
3	Installing lighting and improving indoor lighting.	63 (63%)	37 (37%)	81 (81%)	19 (19%)
4	Wear matching shoes with good support inside outside the home.	48 (48%)	52 (52%)	74 (74%)	26 (26%)
5	Install railing in stairs, bathroom, toilets.	41 (41%)	59 (59%)	48 (48%)	52 (52%)
6	Keep frequently used items in your closet so they can be easily accessed without using stools or climbing up to retrieve items.	61 (61%)	39 (39%)	91 (91%)	9 (9%)
7	Learn how to use assistive devices.	23 (23%)	77 (77%)	63 (63%)	37 (37%)
8	Exercise regularly.	48 (48%)	52 (52%)	46 (46%)	54 (54%)
9	Proper, healthy nutrition.	83 (83%)	17 (17%)	96 (96%)	4 (4%)
10	Positive lifestyle changes such as reducing alcohol consumption, increasing daily exercise, etc.	39 (39%)	61 (61%)	29 (29%)	71 (71%)
11	Find out the risk of falling.	48 (48%)	52 (52%)	50 (50%)	50 (50%)
12	Talk to family members, friends, or health providers about health conditions, drug use, vision of himself.	47 (47%)	53 (53%)	56 (56%)	44 (44%)
13	Regular health check-ups.	52 (52%)	48 (48%)	58 (58%)	42 (42%)
14	Learn about fall prevention measures.	40 (40%)	60 (60%)	42 (42%)	58 (58%)

Comparison of Fall Risk, Knowledge, Attitude and Practice Between Middle-Aged and Older Adults

An independent t-test assuming unequal variances was conducted to compare the mean scores of fall risk assessment, knowledge of risk factors of fall, attitudes toward fall prevention, and practice on fall prevention between middle-aged and older adults. The analysis revealed that there was a statistically significant difference between the two groups for all the variables. (Table 3)

Table 3 Comparison of Fall Risk, Knowledge, Attitude and Practice Between Middle-Aged and Older Adults

Variable	Group	Mean±SD	t	df	p-value
Fall Risk Assessment	Middle – Age	2.75±2.98	-8.82	188	<0.001
	Older Adult	6.98±3.76			
Knowledge of Risk Factors of Fall	Middle – Age	21.21±5.87	-2.10	196	0.037
	Older Adult	22.88±5.36			
Attitudes Toward Fall Prevention	Middle – Age	85.32±9.55	-2.04	191	0.042
	Older Adult	87.84±7.84			

Practice on Fall Prevention	Middle – Age	7.57±4.10	-5.49	170	<0.001
	Older Adult	10.25±2.66			
Independent t-test assuming unequal variances was performed to compare the mean scores for between group.					
n=100 for both group (Middle – Age and Older Adult)					
P <0.05 Statistically Significant					

DISCUSSION

The present cross-sectional study was conducted to compare knowledge, attitude, and practice on fall risk factors and fall prevention among community-dwelling middle-aged and older adults in the Charotar region. The independent t-test revealed statistically significant differences between middle-aged and older adults for fall risk assessment, knowledge, attitude, and practice ($p < .05$). This indicates that age significantly influences awareness and behavior related to falls.

Fall Risk Assessment: In the current study, older adults had significantly higher fall risk scores than middle-aged adults. This finding is consistent with Tinetti et al. (1988), who reported that fall risk increases with age due to age-related declines in balance, gait, vision, and muscle strength. Similarly, a study by Rubenstein (2006) stated that adults aged 60 years and above are twice as likely to experience falls compared to younger adults. The higher fall risk among older adults in the Charotar region may be attributed to similar physiological changes and environmental hazards in community settings^(14,15).

Knowledge on Fall Risk Factors: A significant difference was found in knowledge scores between the two groups. This is supported by Stevens et al. (2006), who found that older adults had better knowledge of fall risk factors compared to middle-aged adults, possibly due to direct experience or health education programs. However, this contrasts with the study by Zijlstra et al. (2009) in the Netherlands, which reported low levels of knowledge about fall prevention even among older adult^(16,17). The difference may be due to variations in health literacy and community health programs between regions. In the Charotar region, ASHA workers and primary health centers may contribute to better awareness among older adults.

Attitude Toward Fall Prevention: The present study showed that older adults had a significantly more positive attitude toward fall prevention than middle-aged adults. This aligns with the findings of Friedman et al. (2002), who reported that perceived susceptibility to falls increases with age, leading to a more favorable attitude toward prevention. In contrast, a study by Yardley et al. (2006) found that many older adults had a negative attitude and considered falls as an inevitable part of aging. The more positive attitude in the present study may reflect increasing awareness campaigns in Gujarat on healthy aging^(18,19).

Practice on Fall Prevention: Significant differences were also observed in practice scores. Older adults reported better preventive practices such as removing home hazards, using proper footwear, and engaging in exercises. This is consistent with Clemson et al. (2004), who found that older adults who perceived themselves at risk were more likely to adopt preventive behaviors. However, this differs from Mahler and Sarvimäki (2012), who reported poor practice of fall prevention despite adequate knowledge in Finnish older adults^(20,21). The gap between knowledge and practice suggests that while awareness exists, barriers such as cost, lack of family support, or cultural beliefs may affect implementation.

The findings of this study suggest that although older adults in the Charotar region have higher knowledge, more positive attitude, and better practice than middle-aged adults, their fall risk remains significantly higher. This indicates that knowledge and attitude alone are not sufficient to reduce fall risk unless translated into consistent practice. This is supported by the Health Belief Model, which states that perceived susceptibility and perceived benefits must lead to action (Rosenstock et al., 1988)⁽²²⁾.

Limitations

1. This study only includes the people from Charotar region so this study results can not apply for generalized population.
2. Practice was measured by self-report, which may be prone to social desirability and recall bias.

Future recommendations

- Conduct longitudinal and interventional studies to establish cause-effect and evaluate effectiveness of educational programs.
- Future studies should include a wider range of predictors like environmental, psychological, and social factors.
- Multi-center studies across Gujarat are recommended for broader generalizability.

CONCLUSION

The study concluded that community-dwelling middle-aged and older adults in the Charotar region differ significantly in their knowledge, attitude, and practice regarding fall prevention. The findings highlight a significant positive relationship between knowledge and attitude. In older adults, attitude emerged as an important factor influencing knowledge. This suggests that health education programs should not focus only on providing information but also on changing attitudes toward fall prevention. Targeting middle-aged adults is crucial to establish preventive behaviors early, before the risk of falls increases with age. Improving knowledge and fostering positive attitudes can ultimately lead to better fall prevention practices and reduce fall-related burden in the community.

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