Knowledge, Attitudes on Fall and Awareness of Hospitalized Patient’s Fall Risk Factors Among the Nurses Working in Tertiary Care Hospitals.

Kavin Mozhi James  
Panimalar College of Nursing  

Divya Ravikumar  
Panimalar Medical College Hospital & Research Institute  

Sindhura Myneni  
Panimalar Medical College Hospital & Research Institute  

Poonguzhali Sivagnanam  
Panimalar College of Nursing  

Poongodi Chellapandian  
Panimalar College of Nursing  

Rejili Grace Joy Manickaraj  
Panimalar College of Nursing  

Yuvasree Sargunan  
Panimalar Institute of Technology Department of Computer Science and Engineering  

Sai Ravi Teja Kamineni  
Panimalar Medical College Hospital & Research Institute  

Krishna Mohan Surapaneni (✉️ krishnamohan.surapaneni@gmail.com)  
Panimalar Medical College Hospital & Research Institute  
https://orcid.org/0000-0002-5204-5708

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Abstract

**Background:** Fall is the most common patient safety incident in health care organization. This study was initiated to obtain information regarding knowledge & attitude on fall and awareness of fall risk factors among nurses to device evidence based and multidisciplinary educational and training programme to improve patient safety and thereby reducing morbidity and mortality associated with fall.

**Methods:** A descriptive cross sectional survey study was conducted among 339 registered nurses working in Tertiary care hospitals across Chennai, Tamil Nadu, India. Modified version of previously validated standard questionnaire was administered by the investigators through online survey method to explore the level of knowledge & attitude on fall and awareness of inpatient fall risk factors among Nurses.

**Results:** In this study, 15.6% of participants had adequate knowledge on fall, 57.2% had favorable attitude towards fall and 38.3% adequate awareness on fall risk factors. Years of experience in nursing has statistical significant association with level of knowledge on fall. The participant's attitude towards fall had statistical significant relationship with age, education, experience in nursing and previous patient fall experience. The correlation between fall knowledge, attitude of fall and awareness of fall risk factors were highly significant. Majority of the participants expressed their favorable attitude towards need for fall preventive education.

**Conclusion:** In our study, it is evident that there is a void which has to be filled to improve the knowledge, attitude and awareness on fall and its risk factors. There is a need for extensive education and holistic, multifactorial and interdisciplinary training program to be undertaken through various health care organizations.

Introduction

A fall is defined as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level (1). Falls and its consequences are major public health problem, making it the second leading cause of accidental deaths worldwide (2). Fall is reported as the most frequent patient safety event occurring in hospitals (3). Fall occur at a rate of 3–5 per 1,000 occupied bed-days, and the Agency for Healthcare Research and Quality estimates that each year 700,000 to 1 million hospitalized patients fall (4). Nearly one in every three inpatients aged 65 years and older sustains fall. The traumatic complications of fall includes physical injury, functional impairment, increased rate of hospitalization and delayed recovery as a result people suffer a lot with a huge burden to the family, health sector, and economy of the country (5, 6, 7). A significant proportion of non-traumatic falls, often instill fear of fall - a post fall syndrome which includes dependency, loss of autonomy, confusion, immobilization, and depression, which will lead to a further restriction in daily activities and thus affects Quality of life (8, 9). Despite the continued efforts to decrease falls in the hospital settings, there continues to be an increased incidence of inpatient falls. Nurses are the true backbone for any health facility. They provide constant care to patients and it is important that they are properly trained to identify risk factors and employ strategies to prevent them. Due to demanding working schedule, lack of awareness, complex patient
profiles, there are high chances that preventable aspect of these “geriatric giants” are not well addressed and often overlooked. Knowledge and attitude of nurses attribute to disseminate and establish a foundation for fall preventive activities in Tertiary care hospitals. Even though falls among hospitalized patient is a well-recognized topic in both nursing and medical literature, in many developing countries it has not been prioritized for research. Hence, the current study had been devised to find out these lacunae and establish the best care for the patients.

Materials And Methods

Study participants

This is a cross sectional study was conducted in Panimalar Medical College Hospital & Research Institute, Chennai, Tamil Nadu, India. A probability random sampling technique was used for selecting the study participants. The Researchers recruited 339 registered nurses who are working in tertiary care hospitals across Chennai aged over 20 years. Registered nurses who are able to read and write English and those willing to give informed consent were only included in the study. Nursing students, trainees and who were not available during data collection were excluded from participating in the study. A semi structured questionnaire was used to gather information from concerned participants at single point in time. Confidentiality of all participants was maintained by assigning unique respondent ID to each participant. This study protocol was approved by the Institutional Review Board (IRB) of the Panimalar Medical College Hospital & Research Institute, Chennai (Panimalar Medical College Hospital & Research Institute IRB #1/2020/003) and conformed to the requirements of the Declaration of Helsinki (as revised in Seoul 2008).

Measures

Modified version of previously validated standard questionnaire was administered by the investigators comprised on 52 questions/ statements on demographic characteristics and information pertaining to the fall and its risk factors. The demographics were followed by 3 sections with set of questions/statements. The Section-1 incorporated 16 simple questions, to assess the knowledge on fall by selecting correct and incorrect options. Section − 2 embraced 13 positive and negative statements on 5 point likert scale, the respondents have to record their response on the 5 point Likert scale ranging from: Strongly agree (SA), Agree (A), Unsure (U), Disagree (D), Strongly Disagree (SD) for obtain information on attitude of fall and Sect. 3 – encompassed risk factor category question with the list of 16 risk factors where the respondent have to select related /unrelated option. The reliability of this tool was analyzed using Cronbach's alpha, wherein \( \alpha = 0.75 \).

Statistical analysis

Each statement/ question was numerically coded to obtain score for knowledge and attitude of fall and awareness of fall risk factors. All the categorical variables are presented as numbers and percentages. Descriptive analysis was performed using univariate statistics to report the Mean and Standard Deviation...
(SD) for the continuous variable and frequency distributions for the categorical variables. Correlation, non-parametric tests of Kruskal-Wallis and Mann-Whitney Test were performed to compare differences in the variables. All reported statistically significant differences were calculated at the 95% confidence level. Spearman’s rho test measured the strength and direction of the relationship between two variables. Chi-square test was used to assess the association between categorical variables. Statistical significance was set at $p < 0.05$. All statistical analyses were performed using Statistical Package for Social Science (SPSS, version 17) for Microsoft windows, SPSS Inc. USA.

Results

Of the 439 participants who were intended to receive survey questionnaires, 339 participants submitted completed questionnaires: a response rate of 75% leaving 339 valid for analysis. Table 1 depicted the demographic characteristics of the nurses. Out of the participants ($n = 339$) are Female (84.1%) and Male (15.9%). Most of the nurses participated in the study (36.3%) were their professional experience is less than 6 months. 21% of the respondent have experienced patients’ that have sustained falls whereas (56.3%) have not experienced previous patient fall. Majority of the respondent (71.7%) have received fall prevention education. However, only (18.3%) were extremely familiar with fall prevention activities.

Knowledge on fall

Considering overall level of knowledge of the 339 participants, 26.8% ($n = 91$) of individuals had inadequate knowledge, 57.5% ($n = 193$) had moderately adequate knowledge, and 15.6% ($n = 53$) had adequate knowledge on fall. (Fig. 1). The average mean knowledge of the study participants was $10.05 \pm 2.219$ (Table 5). Correlation between level of knowledge and participants’ years of experience in nursing alone showed statistically significant relationship at $p<0.01$ among all the selected demographic variable. (Table 6) Similarly only years of experience in nursing has statistical significant association ($p<0.01$) with level of knowledge on fall. (Table 7)

The statements concerned with diseases condition and medications related to fall as expressed by the participants represented lowest of all knowledge scores were: 42% for “Taking medicine for diabetics is not related to fall” and “Intravenous therapy or intravenous access has a risk for fall,”. 46% for “Depression is not related to fall and 47.2% for Taking medicines for blood pressure is not related to fall” (Table 2)

Attitude towards fall

In this present study, 2% ($n = 6$) had unfavorable attitude, 42.2% ($n = 143$) had moderately favorable attitude and 57.2% had favorable attitude towards fall. (Fig. 1) 49.69 $\pm 5.746$ was the average mean attitude of the study participants. (Table 5) The participants’ attitude towards fall had statistical significant relationship at $p0.001$ with age, education, experience in nursing and previous fall experience at $p0.05$. (Table 6) There were statistical significant associations between attitude of fall with age ($0.05$), gender ($p0.001$), educational qualification ($p < 0.001$) and experience in nursing ($p 0.001$). (Table 7)
The lowest mean score for the statements on attitude of fall were: 2.58 ± 1.24 for the statement “hospital environment is safe for fall”. 2.66 ± 1.26 for “fall is unavoidable” Majority of the participants expressed their favorable attitude towards need for fall preventive education. 4.56 ± 0.74 (Table 3)

**Awareness of fall risk factors**

The participants level of awareness on fall risk factors were 38.3% (n = 130) adequate, 52.2% (n = 177) moderately adequate and 9.4% (n = 32) inadequate. (Fig. 1) The average mean value was 11.48 ± 2.165. (Table 5) The correlation between fall knowledge, attitude of fall and awareness of fall risk factors were highly significant at p0.0001 with 95% CI. (Table 5)
Table 1
Demographic characteristics of the nurses included in the study (N = 339)

| Demographics                      | Frequency | Percentage (%) |
|-----------------------------------|-----------|----------------|
| **AGE**                           |           |                |
| ≤ 20 years                        | 47        | 13.9           |
| 21–25 years                       | 174       | 51.3           |
| 26–30 years                       | 56        | 16.5           |
| > 30 years                        | 285       | 84.1           |
| **GENDER**                        |           |                |
| Female                            | 87        | 25.7           |
| Male                              | 3         | .9             |
| **EDUCATIONAL QUALIFICATION**     |           |                |
| Diploma in nursing & Midwifery    | 205       | 60.5           |
| P.C.B.Sc                           | 44        | 13.0           |
| Midwifery                         | 123       | 36.3           |
| B.Sc Nursing                      | 75        | 22.1           |
| M.Sc Nursing                      | 19        | 5.6            |
| **EXPERIENCE IN NURSING**         |           |                |
| Less than 6 months                | 148       | 43.7           |
| 6 months – 2 years                | 191       | 56.3           |
| 2–6 years                         | 243       | 71.7           |
| 7–10 years                        | 96        | 28.3           |
| More than 10 years                | 62        | 18.3           |
| **PREVIOUS PATIENT FALL EXPERIENCE** |   |                |
| Yes                               | 32        | 37.2           |
| No                                | 16        | 9.4            |
| **RECEIVED FALL PREVENTION EDUCATION** | |                |
| Yes                               | 126       | 4.7            |
| No                                | 103       | 30.4           |
| Demographics               | Frequency | Percentage (%) |
|----------------------------|-----------|----------------|
| Extremely familiar         |           |                |
| Very familiar              |           |                |
| Somewhat familiar          |           |                |
| Not so familiar            |           |                |
| Not at all familiar        |           |                |
Table 2
Statements that evaluate participants knowledge on fall in this study (N = 339)

| Items                                                                 | Mean | Standard Deviation |
|-----------------------------------------------------------------------|------|--------------------|
| Recurrence rate is high among anyone who has already experienced a fall | .67  | .472               |
| Falls occur most frequently among safety incidents in hospitals.      | .58  | .495               |
| Falls increase an elderly persons’ death rate.                        | .77  | .420               |
| Elderly hip fractures occur by falls                                  | .89  | .312               |
| Sliding is not falling                                                | .55  | .499               |
| The more medicine you take, the higher your fall risk.                | .58  | .494               |
| The more diseases you have, the higher your fall risk                 | .66  | .473               |
| Depression is not related to falls                                    | .46  | .499               |
| Someone who has a visual impairment has a higher risk for falls.       | .91  | .280               |
| Being numb in the limbs is not related to falls                       | .57  | .496               |
| Dysuria is a risk factor for falls                                     | .70  | .458               |
| Taking medicine for diabetes is not related to falls                   | .42  | .495               |
| Taking medicine for blood pressure is not related to falls            | .47  | .500               |
| Hearing impaired is not related to falls                               | .53  | .500               |
| Falls occur more when getting up from and down on beds in hospitals.  | .86  | .343               |
| IV therapy or IV access has a risk for fall                           | .42  | .495               |
| Items                                                                 | Mean | Std. Deviation |
|----------------------------------------------------------------------|------|----------------|
| I am concerned about patient falls.                                  | 4.39 | .726           |
| I think falls among patients is unavoidable                          | 2.66 | 1.268          |
| I think nurses are responsible for patients’ falls.                  | 3.75 | 1.235          |
| Fall prevention is higher priority for intervention.                | 4.35 | .794           |
| I have concern about nursing interventions for fall prevention      | 4.29 | .872           |
| Fall prevention interventions should be conducted actively          | 4.37 | .725           |
| A patients’ fall risk level should be inspected when hospitalised.  | 4.32 | .900           |
| Falls preventive education is necessary.                             | 4.56 | .741           |
| Falls occur because of patients.                                     | 2.59 | 1.082          |
| I will help immediately if someone asks for help when they move.    | 4.53 | .750           |
| Physical injury is not severe even if a fall happens                 | 3.07 | 1.218          |
| The hospital environment is safe for falls.                          | 2.58 | 1.241          |
| I feel guilty if my patient falls.                                   | 4.21 | .908           |

Table 4: Frequency and Percentage of level of awareness on fall risk factors among the nurses (N = 339).
Table 5
Correlation between knowledge, attitudes on fall and awareness of fall risk factors among nurses (N = 339)

| RISK FACTOR               | CATEGORY  | n    | Percentage (%) |
|---------------------------|-----------|------|----------------|
| Gender                    | Related   | 182  | 53.7           |
|                           | Unrelated | 157  | 46.3           |
| Educational level         | Related   | 138  | 40.7           |
|                           | Unrelated | 201  | 59.3           |
| Hearing                   | Related   | 247  | 72.9           |
|                           | Unrelated | 92   | 27.1           |
| Depression                | Related   | 254  | 74.9           |
|                           | Unrelated | 85   | 25.1           |
| Taking medicine           | Related   | 290  | 85.5           |
|                           | Unrelated | 49   | 14.5           |
| Urinary incontinence      | Related   | 205  | 60.5           |
|                           | Unrelated | 134  | 39.5           |
| Number of chronic disease | Related   | 258  | 76.1           |
|                           | Unrelated | 81   | 23.9           |
| Cognitive impairment      | Related   | 283  | 83.5           |
|                           | Unrelated | 56   | 16.5           |
| Insomnia                  | Related   | 294  | 86.7           |
|                           | Unrelated | 45   | 13.3           |
| Age                       | Related   | 302  | 89.1           |
|                           | Unrelated | 37   | 10.9           |
| Use of assistive device   | Related   | 268  | 79.1           |
|                           | Unrelated | 71   | 20.9           |
| Anxiety for fall          | Related   | 276  | 81.4           |
|                           | Unrelated | 63   | 18.6           |
| Sight                     | Related   | 291  | 85.8           |
|                           | Unrelated | 48   | 14.2           |
| RISK FACTOR               | CATEGORY   | n   | Percentage (%) |
|--------------------------|------------|-----|----------------|
| Walking disorder         | Related    | 313 | 92.3           |
|                          | Unrelated  | 26  | 7.7            |
| Activities of daily living | Related    | 262 | 77.3           |
|                          | Unrelated  | 77  | 22.7           |
| Dizziness                | Related    | 306 | 90.3           |
|                          | Unrelated  | 33  | 9.7            |

Table 6
Correlation of different characteristic variables with knowledge and attitude of fall

| Variables                  | Mean   | S.D   | Spearman’s rho & p-value, Sig. |
|----------------------------|--------|-------|--------------------------------|
| Knowledge                  | 10.05  | 2.22  | r = 0.206                      |
| Attitude                   | 49.7   | 5.75  | p = 0.001                      |
| Knowledge                  | 10.05  | 2.22  | r = 0.252                      |
| Awareness on fall risk factors | 11.48  | 2.16  | p = 0.001                      |
| Attitude                   | 49.7   | 5.75  | r = 0.214                      |
| Awareness on fall risk factors | 11.48  | 2.16  | p = 0.001                      |
Table 7
Association of demographic variables with level of knowledge and level of attitude among participants enclosed in this study.

| Variables                          | Knowledge on Fall | Attitude on Fall |
|-----------------------------------|-------------------|------------------|
|                                   | N     | Mean Rank | N     | Mean Rank |
| **Kruskal-Wallis Test**           |       |           |       |           |
| **Age**                           |       |           |       |           |
| ≤ 20 Years                        | 47    | 155.93    | 47    | 143.17    |
| 21–25 Years                       | 174   | 161.02    | 174   | 157.05    |
| 26–30 Years                       | 56    | 191.46    | 56    | 175.93    |
| > 30 Years                        | 62    | 186.48    | 62    | 221.31    |
| **Gender**                        |       |           |       |           |
| Female                            | 285   | 170.28    | 285   | 174.42    |
| Male                              | 54    | 168.50    | 54    | 146.67    |
| **Educational Qualification**     |       |           |       |           |
| Diploma in Nursing and Midwifery  | 87    | 169.11    | 87    | 125.41    |
| P.C.B.Sc                          | 3     | 159.00    | 3     | 174.33    |
| B.Sc Nursing                      | 205   | 170.33    | 205   | 175.27    |
| M.Sc Nursing                      | 44    | 170.95    | 44    | 233.32    |
| **Experience in Nursing**         |       |           |       |           |
| Less than 6 Months                | 123   | 165.21    | 123   | 153.56    |
| 6 Months – 2 Years                | 75    | 153.81    | 75    | 163.08    |
| 2–6 Years                         | 82    | 175.11    | 82    | 151.40    |
| 7–10 Years                        | 19    | 212.21    | 19    | 228.61    |
| Variables                      | Knowledge on Fall | Attitude on Fall |   |   |
|-------------------------------|-------------------|------------------|---|---|
|                               | N     | Mean Rank | N  | Mean Rank |
|                               | More than 10 Years  | 40 | 184.56 | 40 | 243.83 |
|                               | Previous fall experience  | Yes | 148 | 170.50 | Z = 0.083 p = 0.934 | 148 | 152.44 | Z = 2.909 p = 0.004 |
|                               |                               | No  | 191 | 169.62 |                             | 191 | 183.61 |
|                               | Received fall prevention education  | Yes | 243 | 176.62 | Z = 1.997 p = 0.046 | 243 | 176.14 | Z = 1.839 p = 0.066 |
|                               |                               | No  | 96  | 153.26 |                             | 96  | 154.45 |
|                               | Fall prevention activity  | Extremely familiar  | 62 | 149.93 | H = 7.091 d.f = 4 p = 0.131 | 62 | 162.38 | H = 6.042 d.f = 4 p = 0.196 |
|                               |                               | Very familiar      | 103| 183.88 |                             | 103 | 185.34 |
|                               |                               | Somewhat familiar  | 126| 175.00 |                             | 126 | 170.72 |
|                               |                               | Not so familiar    | 32 | 145.84 |                             | 32  | 145.84 |
|                               |                               | Not at all familiar | 16 | 167.38 |                             | 16  | 143.44 |

H: Kruskal–Wallis test; Z: Mann-Whitney Test, p < 0.05 is considered as Statistically significant.

NS – Not significant.
| Demographics       | Level of Knowledge on fall | Level of Attitude on fall |
|--------------------|----------------------------|----------------------------|
|                    | Inadequate | Modately Adequate | Adequate | Chi-Square Test, P-value & Sig. | Unfavorable | Modately Favorable | Favorable | Chi-Square Test, P-value & Sig. |
| Age                |            |                  |          |                               |             |                      |           |                               |
| ≤ 20 Years         | 15     | 26               | 6        | $\chi^2 = 6.695$ d.f = 6     | 0           | 25                   | 22        | $\chi^2 = 14.39$ d.f = 6     |
| 21–25 Years        | (31.9%)  | (55.3%)          | (12.8%)  |                               | (0.0%)      | (53.2%)              | (46.8%)   |                               |
|                    | 50      | 103              | 21       |                               | 2           | 81                   | 91        |                               |
|                    | (28.7%)  | (59.2%)          | (12.1%)  |                               | (1.1%)      | (46.6%)              | (52.3%)   |                               |
| 26–30 Years        | 12      | 32               | 12       |                               | 0           | 22                   | 34        |                               |
|                    | (21.4%)  | (57.1%)          | (21.4%)  |                               | (0.0%)      | (39.3%)              | (60.7%)   |                               |
| >30 Years          | 14      | 34               | 14       |                               | 0           | 15                   | 47        |                               |
|                    | (22.6%)  | (54.8%)          | (22.6%)  |                               | (0.0%)      | (24.2%)              | (75.8%)   |                               |
| Gender             |            |                  |          |                               |             |                      |           |                               |
| Female             | 78      | 161              | 46       | $\chi^2 = 0.807$ d.f = 2     | 0           | 115                  | 170       | $\chi^2 = 13.81$ d.f = 3     |
|                    | (27.4%)  | (56.5%)          | (16.1%)  |                               | (0.0%)      | (40.4%)              | (59.6%)   |                               |
| Male               | 13      | 34               | 7        |                               | 2           | 28                   | 24        |                               |
|                    | (24.1%)  | (63.0%)          | (13.0%)  |                               | (3.7%)      | (51.9%)              | (44.4%)   |                               |
| Educational Qualification | 19  | 56               | 12       | $\chi^2 = 3.319$ d.f = 6     | 1           | 57                   | 29        | $\chi^2 = 33.28$ d.f = 2     |
| Diploma in Nursing and Midwifery | (21.8%)  | (64.4%)          | (13.8%)  |                               | (1.1%)      | (65.5%)              | (33.3%)   |                               |
| P.C.B. Sc          | 1       | 2                | 0        |                               | 0           | 1                    | 2         |                               |
|                    | (33.3%)  | (66.7%)          | (0.0%)   |                               | (0.0%)      | (33.3%)              | (66.7%)   |                               |
| Demographics   | Level of Knowledge on fall | Level of Attitude on fall | Chi-Square Test, P-value & Sig. | Chi-Square Test, P-value & Sig. |
|----------------|---------------------------|---------------------------|--------------------------------|--------------------------------|
|                | Inadequate | Moderately Adequate | Adequate | Unfavorable | Moderately Favorable | Favorable |                |                |
| B.Sc Nursing   | 60        | 111 (54.1%)        | 34 (16.6%) | 1           | 77 (37.6%)       | 127 (62.0%) | χ² = 20.81 | p = 0.001     |
|                | (29.3%) |                   |          | ( )         | ( )             | ( )         | d.f = 8     | N.S           |
| M.Sc Nursing   | 11        | 26 (59.1%)        | 7 (15.9%) | 0           | 8 (18.2%)       | 36 (81.8%)  | χ² = 31.44 | p = 0.001     |
|                | (25.0%) |                   |          | ( )         | ( )             | ( )         | d.f = 8     | N.S           |
| Experience in Nursing | Less than 6 Months | 31 | 78 (63.4%) | 14 (11.4%) | 0 | 61 (49.6%) | 62 (50.4%) | χ² = 0.404 | p = 0.817     |
|                | (25.0%) |                   |          | ( )         | ( )             | ( )         | d.f = 2     | N.S           |
|                | 6 Months - 2 Years | 21 | 47 (62.7%) | 7 (9.3%) | 2 | 30 (40.0%) | 43 (57.3%) | χ² = 5.606 | p = 0.061     |
|                | (28.0%) |                   |          | ( )         | ( )             | ( )         | d.f = 2     | N.S           |
|                | 2-6 Years | 28 | 35 (42.7%) | 19 (23.2%) | 0 | 43 (52.4%) | 39 (47.6%) | χ² = 20.81 | p = 0.001     |
|                | (34.1%) |                   |          | ( )         | ( )             | ( )         | d.f = 8     | N.S           |
|                | 7-10 Years | 4 | 8 (42.1%) | 7 (36.8%) | 0 | 4 (21.1%) | 15 (78.9%) | χ² = 31.44 | p = 0.001     |
|                | (21.1%) |                   |          | ( )         | ( )             | ( )         | d.f = 8     | N.S           |
|                | More than 10 Years | 7 | 27 (67.5%) | 6 (15.0%) | 0 | 5 (12.5%) | 35 (87.5%) | χ² = 0.404 | p = 0.817     |
|                | (17.5%) |                   |          | ( )         | ( )             | ( )         | d.f = 2     | N.S           |
| Previous patient fall experience | Yes | 38 | 88 (59.5%) | 22 (14.9%) | 1 | 73 (49.3%) | 74 (50.0%) | χ² = 5.606 | p = 0.061     |
|                | (25.7%) |                   |          | ( )         | ( )             | ( )         | d.f = 2     | N.S           |
|                | No | 53 | 107 (56.0%) | 31 (16.2%) | 1 | 70 (36.6%) | 120 (62.8%) | χ² = 0.404 | p = 0.817     |
|                | (27.7%) |                   |          | ( )         | ( )             | ( )         | d.f = 2     | N.S           |
| Demographics | Level of Knowledge on fall | Level of Attitude on fall | Chi-Square Test, P-value & Sig. | Chi-Square Test, P-value & Sig. |
|--------------|---------------------------|---------------------------|--------------------------------|--------------------------------|
|              | Inadequate | Moderately Adequate | Adequate | Unfavorable | Moderately Favorable | Favorable |              |
| Received fall prevention education | Yes | 63 (25.9%) | 136 (56.0%) | 44 (18.1%) | 1 (0.4%) | 97 (39.9%) | 145 (59.7%) | $\chi^2 = 3.986$, d.f = 2 |
|              | No | 28 (29.2%) | 59 (61.5%) | 9 (9.4%) | 1 (1.0%) | 46 (47.9%) | 49 (51.0%) | $\chi^2 = 2.402$, d.f = 2 |
| Fall prevention activity | Extremely familiar | 18 (29.0%) | 38 (61.3%) | 6 (9.7%) | 0 (0.0%) | 31 (50.0%) | 31 (50.0%) | $\chi^2 = 15.08$, d.f = 8 |
|              | Very familiar | 27 (26.2%) | 55 (53.4%) | 21 (20.4%) | 0 (0.0%) | 35 (34.0%) | 68 (66.0%) | $\chi^2 = 11.47$, d.f = 8 |
|              | Some what familiar | 31 (24.6%) | 71 (56.3%) | 24 (19.0%) | 1 (0.8%) | 52 (41.3%) | 73 (57.9%) | $\chi^2 = 19.8$, d.f = 8 |
|              | Not so familiar | 13 (40.6%) | 17 (53.1%) | 2 (6.3%) | 1 (3.1%) | 17 (53.1%) | 14 (43.8%) | $\chi^2 = 17.8$, d.f = 8 |
|              | Not at all familiar | 2 (12.5%) | 14 (87.5%) | 0 (0.0%) | 0 (0.0%) | 8 (50.0%) | 8 (50.0%) | $\chi^2 = 17.8$, d.f = 8 |

$p < 0.05$ is considered as Statistically significant.

NS – Not significant.

**Discussion**

Fall in hospitalized patients is almost always preventable (10, 11). Nurses with adequate knowledge and awareness on fall and its risk factors, are anticipated to bring about be a significant reduction in the prevalence of fall occurrence and positive influence on fall among hospitalized patients (12). In our
present study, 43.7% of nurses had previous patient fall experience which is similar to that reported by various studies (13, 14). This is much higher than that reported by Kim et al (15). These differences may be due to nature of hospital infrastructure, years of nursing training program and difference in patient profiles.

Despite the fact that majority of the participants (71.7%) reported “received fall prevention education”, only 15.6% had adequate level of knowledge which was lower when compared with the study reported by Kim et al (15), where 85.7% of nurses had high level of knowledge. Similar to our study, Laing et al (16) reported a lower level of knowledge among health workers about fall. In our study majority of the nurses had working experience of less than 2 years hence low level of knowledge regarding a complex multifactorial event like fall can be attributed.

In the assessment of knowledge session of the questionnaire statements pertaining to diseases condition, treatment related and medications related to fall as expressed by the participants represented lowest of all score similar with a previous studies (15, 16). This could be attributed to not incorporating multidisciplinary evidenced based training on fall with new perspective. In India, it is a harsh reality that many hospitals neither have standard policies and procedures nor training programs on falls and its prevention. Laing et al (16) revealed that knowledge and skills of nurses related to fall and its prevention was improved after the training confirmed the need for evidence based training. Hence, introduction of a care bundle approach frequent in-services and focus groups may enhance nurses learning and improve clinical outcomes.

This study revealed majority 57.2% had favorable attitude towards fall which supports the study by Kim CG et al (14) where the attitude level of nurses was 77.2% positive on fall. This may be due to the social and cultural empathy incorporated in training. Contradictory results have been shown in various other studies (13, 14, 17). This may be due to difference in nature of study participants (students, workers). However, the potential gaps in awareness of fall risk factors may be addressed through developing nurse sensitive, context-specific fall-prevention clinical guidelines for practice in India.

In our study 52.2% had moderately adequate awareness on fall risk factors .In contrast 60% of health care professionals including nurses had little or some awareness on fall risk factors in a study (18, 19). Therefore, an onsite training program on awareness of fall risk factors designed for nurses is crucial and need of the hour in order to help them identify the most important risk factors for falls and translate the knowledge into practice. Majority of the participants (66.1%) expressed need for fall preventive education in this study this achieved through developing multifactorial, multidisciplinary fall preventive educational program and introducing bundle approach on fall.

The years of experience in nursing showed both strong association and positive relationship with level of knowledge. This implies that the knowledge improves as they gain more working experience because they obtain more information and hands on experience. The attitude of nurses towards fall had strong associations with age, gender, educational qualification and experience in nursing. This implies that as
their experience in nursing care increases with education and patient care the more the positive attitude they develop on fall and its preventive measure.

Interestingly, our study also showed a strong correlation between knowledge, attitude and awareness of fall preventive measures with each other. This is supported by several studies as well (14, 15, 16, 20). This shows that continued medical education and training of nurses is required to bring about an overall change in fall incidents in hospitalized patients.

**Conclusion**

In our study, it is evident that there is a void which has to be filled to improve the knowledge, attitude and awareness on fall and its risk factors. There is a need for extensive education and holistic, multifactorial and interdisciplinary training program to be undertaken through various health care organization including governmental and non-governmental organizations regarding fall and risk factors of fall to reduce fall occurrence thereby ensuring patient safety.

**Declarations**

**Ethics approval and consent to participate:** Institutional Review Board (IRB) Approval has been obtained prior to start of the study (Panimalar Medical College Hospital & Research Institute IRB #1/2020/003). Informed Consent has been obtained from all the participants of the study.

- **Consent for publication:** All authors provided their consent for publication of this manuscript.

- **Availability of data and material:** The data used to support the findings of this study are available from the corresponding author upon request.

- **Competing interests:** “All the authors declare no conflict of interest.”

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- **Authors' contributions:** KMJ, DR, SM, SKM: having contributed equally to the work; PS, YS: contributed to data curation, validation, visualization and writing the manuscript; PC, RGJM, SRTK: contributed to formal analysis, validation, visualization and writing the manuscript; KMJ, DR, SM, PS, PC, RGJM, YS, SRTK & SKM: All authors reviewed the manuscript and approved the submitted manuscript.

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- **Author’s Information:**
Mrs. Kavin Mozhi James is Professor in Department of Medical Surgical Nursing, Panimalar College of Nursing, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: kavin1608@gmail.com

Dr. Divya Ravikumar is a Junior Resident in Department of Obstetrics & Gynecology, Panimalar Medical College Hospital & Research Institute, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: divya.ravi.chennai@gmail.com

Dr. Sindhura Myneni is Senior Resident in Department of Obstetrics & Gynecology, Panimalar Medical College Hospital & Research Institute, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: sindhuramyneni15@gmail.com

Mrs. Poonguzhali Sivagnanam is Principal cum Professor in Department of Medical Surgical Nursing, Panimalar College of Nursing, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: kuzhaliram@gmail.com

Mrs. Poongodi Chellapandian is an Associate Professor in Department of Obstetrics & Gynaecological Nursing, Panimalar College of Nursing, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: cpoongodi@hotmail.com

Mrs. Rejili Grace Joy Manickaraj is Assistant Professor in Department of Mental Health Nursing, Panimalar College of Nursing, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: rgracejoy@yahoo.co.in

Ms. Yuvasree Sargunan is an Assistant Professor in Department of Computer Sciences, Panimalar Institute of Technology, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: sargunanyuvasree@gmail.com

Dr. Sai Ravi Teja Kamineni is a Junior Resident in Department of Tuberculosis & Respiratory Diseases, Panimalar Medical College Hospital & Research Institute, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: ravi.kaminenin@gmail.com

Dr. Surapaneni Krishna Mohan is Professor in Department of Biochemistry; Head of Department of Clinical Skills & Simulation, Panimalar Medical College Hospital & Research Institute, Varadharajapuram, Poonamallee, Chennai – 600 123, Tamil Nadu, INDIA. E-mail: krishnamohan.surapaneni@gmail.com

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Figures

![Bar Chart]

**Figure 1**

Overall percentage distribution of level of knowledge & attitude on fall and awareness of fall risk factors.