

# Fall prevention activities and associated factors among nurses in Vietnam's Mekong Delta

Original Article

Nhan Thi Nguyen<sup>a,\*</sup>, Thuy Hong Phan<sup>a</sup>, Faye Irene Hummel<sup>b</sup>

<sup>a</sup>Faculty of Nursing and Medical Technology, University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City 700000, Vietnam

<sup>b</sup>School of Nursing, University of Northern Colorado, Greeley, CO 80639, USA

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**Abstract:** **Objective:** Patient falls in the healthcare settings are unwanted events that can have severe consequences for both inpatients and outpatients; however, falls are preventable and nurses play an important role in this prevention. The purpose of this study was to investigate nurse activities in fall prevention and its relevant factors.

**Methods:** This descriptive cross-sectional study was conducted at Can Tho Central General Hospital, with the participation of 90 nurses. Data were collected using a structured questionnaire consisting of five parts, including personal characteristics, knowledge about fall prevention, self-efficacy in fall prevention, nursing practice environment, and fall prevention activities. The data were entered and analyzed using SPSS 18.0 software with descriptive statistics, independent *t*-test, one-way ANOVA, and Pearson's correlation coefficients.

**Results:** The mean score of participants' knowledge in fall prevention was 4.67 (SD = 2.50) out of 11 scores; the self-efficacy score was 49.43 (SD = 8.55) out of 66 scores; nursing practice environment score was 29.69 (SD = 4.00) out of 40 scores; and the fall prevention activity scores were 75.58 (SD = 9.96) out of 100 scores. Factors related to fall prevention activities included gender ( $p = 0.03$ ), place of work ( $p = 0.02$ ), number of fall prevention training sessions ( $p = 0.03$ ), self-efficacy in fall prevention ( $r = 0.61$ ,  $p < 0.001$ ), and the nursing practice environment ( $r = 0.25$ ,  $p < 0.05$ ).

**Conclusions:** An intervention program for fall prevention can be implemented to enhance the knowledge about fall prevention among nurses and improve the nursing practice environment to enhance patient safety.

**Keywords:** fall prevention • hospital • nurses • patients • Vietnam

## 1. Introduction

According to the World Health Organization, falls are the second cause of death from unintentional injuries worldwide.<sup>1</sup> In the hospital, falls are the most commonly reported patient safety incidents.<sup>2</sup> Falls in the hospital can worsen a patient's condition. In addition, fall-related injuries can

increase the cost of treatment and the length of hospital stay.<sup>3</sup> Therefore, falls are not only a burden for individuals and families but also a burden for the health sector.

The incidence of falls among the elderly in Vietnam ranged from 21.6% to 35.5%<sup>4</sup> and 16.8% of patients

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\*Corresponding author.

who had a fall, needed to be admitted to the hospital.<sup>5</sup> To prevent falls at hospitals, the Joint Commission International (JCI) established standards for hospitals to enhance the safety of inpatients.<sup>6</sup> The Vietnamese Ministry of Health established fall prevention as one criteria used to measure, check, and monitor the quality of care in hospitals.<sup>7</sup> Identifying risks and devising effective interventions can reduce the fall rate by 20%–30%.<sup>2</sup> Falls can be significantly decreased through nursing instruction or intervention strategies.<sup>8</sup> Accordingly, nurses play an important role in preventing this risk for patients in the hospital; so it is necessary to explore the nurse activities in fall prevention.

Recently, research on the fall prevention activities of nurses has become increasingly focused on understanding the situation and related factors to decrease fall risk in the hospital.<sup>9–11</sup> However, in Vietnam, current research on fall prevention is limited. These studies focus only on surveying nurses' fall prevention knowledge and activities, without exploring other relevant factors.<sup>12–14</sup> Can Tho Central General Hospital is a tertiary hospital in the Mekong Delta where patients who require specialized care are received and treated; this care is unavailable at the lower level hospitals in the Mekong Delta. This tertiary hospital is responsible for the care of approximately 20 million people in this area, with a daily census of approximately 200 patients. Therefore, it is crucial to focus on fall prevention and identify the factors related to nurse activities in this hospital. The research results captured nurse activities in fall prevention and identified the related factors to guide the development of fall prevention education for nurses to reduce falls to enhance and ensure patients' safety in the hospital. Therefore, the objectives of this study were to investigate nurse activities in fall prevention and to identify the factors that related to nurse activities in fall prevention.

## 2. Methods

### 2.1. Study design

A descriptive cross-sectional study was conducted at Can Tho Central General Hospital in Vietnam to identify factors related to nurse activities in fall prevention.

### 2.2. Participants

The population of the study was nurses working in clinical departments at Can Tho Central General Hospital. The inclusion criteria included nurses who directly participated in nursing care in internal and surgical medicine departments. The exclusion criteria were nurses

who were absent at the time of data collection, such as those in postpartum period, study, sickness, and/or nurses who were in management tasks and not in direct patient care. Participation in the study was voluntary.

The sample size was calculated by using the one-mean estimation formula. In this study, the results of minimum sample size was estimated at 89 participants. A convenient sampling method was used to recruit 90 participants from February 2022 to May 2022.

### 2.3. Measurements

The research instrument was developed and modified from previous studies<sup>13,15–17</sup> and translated into Vietnamese language by back-translation method for the instrument that was originally developed in English.<sup>18</sup> Then the validity of the whole questionnaire was determined by the evaluation of 3 experts with the results of I-CVI = 1.00. The reliability of the questionnaire was verified by the pilot study with the participation of 30 nurses with characteristics similar to the sample population. The reliability of fall prevention knowledge scale was tested by KR-20 with a result of 0.8; the Cronbach's alpha of self-efficacy in fall prevention scale, nursing practice environment scale, and nurse activities for fall prevention scale were 0.90, 0.91, and 0.92, respectively. The questionnaire consisted of five parts as follows.

#### 2.3.1. Part 1

Personal characteristics included nine items in the form of multiple choices and filling in the blanks. It consisted of age, gender, professional qualifications, work experience, place of work, the number of assigned patients per day, experience with patient falls, and fall prevention training.

#### 2.3.2. Part 2

Fall prevention knowledge scale was modified from an existing instrument<sup>15</sup> and consisted of 11 true/false items to assess the knowledge of fall risk, fall prevention, and fall management. One point was given for each correct answer for a total score of 11 points, where higher scores indicate the higher level of fall prevention knowledge.

#### 2.3.3. Part 3

Self-efficacy in fall prevention was modified from an existing instrument<sup>16</sup> and consisted of 11 items to assess the self-efficacy among nurses about sharing the information to prevent falls and use of the fall assessment tool. The response of each item was a 6-point Likert

scale in which 1 = strongly unconfident and 6 = strongly confident with a total score of 66 points; higher scores indicate higher self-efficacy in fall prevention.

#### **2.3.4. Part 4**

The nursing practice environment was modified from existing published instruments<sup>17</sup> and consisted of 10 items about the characteristics of the organization that facilitate or limit the fall prevention activities of nurses. The items were in the 4-level rating scale from 1 = strongly disagree and 4 = strongly agree. The total score ranged from 10 points to 40 points, where higher scores indicate an enhanced nursing practice environment for fall prevention.

#### **2.3.5. Part 5**

The fall prevention activities tool was developed from a published instrument<sup>13</sup> consisting of 20 items that described nurses' fall prevention activities, including patient fall risk, activities in fall prevention, and activities in fall management. The responses were in the 5-point Likert scale ranging from 1 = never to 5 = always. The total scores ranged from 20 points to 100 points, where higher scores indicate the higher nurses' fall prevention activities.

### **2.4. Data collection**

The data collection steps were as follows: the researchers gained permission from the director and the dean of clinical departments to contact nurses to obtain the consent form. The time for data collection was from 9:30 am to 10:30 am or from 1:30 pm to 3:00 pm, after the nurses finished their daily duties. Completion of the questionnaire took approximately 30–40 min. After receiving the self-administered questionnaires, the researchers entered the data into the statistical software for data analysis.

### **2.5. Data analysis**

Data were analyzed using SPSS 18.0 software with the significance level set at 0.05. Assumptions were checked and met before conducting the analysis. The continuous variables (fall prevention knowledge, self-efficacy in fall prevention, the nursing practice environment, and fall prevention activities) were tested for normality and the value of skewness/SD skewness was within  $\pm 1.96$ . Descriptive statistics were used to describe the personal characteristics and calculate the scores of fall prevention knowledge, self-efficacy, nursing practice

environment, and fall prevention activities. The difference in fall prevention activity mean scores between groups in personal characteristics were analyzed by *t*-test or ANOVA. The Pearson correlation was used to identify the relationship between fall prevention knowledge, self-efficacy in fall prevention, nursing practice environment, and nurse activities in fall prevention.

### **2.6. Ethical considerations**

This research was approved by the Ethics Committee in Biomedical Research of the University of Medicine and Pharmacy at Ho Chi Minh City, No. 824/HDDD-DHYD signed on December 17, 2021. The study respected voluntary participation and ensured compliance with ethical regulations in biomedical research. The informed consent was obtained and questions answered from the nurse participants before data collection. All information was confidential and used only for scientific research purposes.

## **3. Results**

### **3.1. Personal characteristics of nurses participating in the study**

Most participants were aged <30 years (46.67%); the youngest participant was 23 years old and the oldest was 55 years old. The ratio between females and males was 3:1. In terms of professional qualifications, most of the participants earned the college degree with 3 years of training in nursing (65.56%); 43.33% of participants reported  $\geq 10$  years of nursing experience. Nurses working in the surgical medicine department accounted for a higher proportion of internal medicine department (58.89% vs 41.11%). About 58.89% of the nurses reported a daily workload of >10 patients. Most nurses (80.00%) had experience with caring for patients who had fallen. Most nurses regularly participated in fall prevention training (93.33%), of which 85.71% participated in training once a year and 14.29% had training twice a year. The details of the results are shown in Table 1.

### **3.2. The scores of knowledge, self-efficacy in fall prevention, practice environment, and fall prevention activities of nurses**

The mean scores of fall prevention knowledge among nurses was 4.67 (SD = 2.50) out of 11 scores. The mean score of nurse self-efficacy in fall prevention was 49.43 (SD = 8.55) out of 66 scores, with a higher score meaning greater self-efficacy in fall prevention. The mean score of the nursing practice environment was 29.69 (SD = 4.00) out of 40 scores. The higher the score,

Personal characteristics	Frequency (n)	Percentage (%)
<i>Age (years old), Median = 31.00, Range (26.00–38.00), Min = 23, Max = 55</i>		
≤30	42	46.67
31–45	41	45.55
≥46	7	7.78
<i>Gender</i>		
Male	21	23.33
Female	69	76.67
<i>Professional qualifications</i>		
Intermediate	8	8.89
College	59	65.56
University	23	25.55
<i>Work experience (years)</i>		
<3	14	15.56
3–5	14	15.56
5–10	23	25.55
≥10	39	43.33
<i>Place of work</i>		
Internal medicine department	37	41.11
Surgical medicine department	53	58.89
<i>The number of patients taking care per day</i>		
≤10	37	41.11
>10	53	58.89
<i>Experience with patient falls</i>		
Yes	72	80.00
No	18	20.00
<i>Fall prevention training</i>		
Yes	84	93.33
Once a year	72	85.71
Twice a year	12	14.29
No	6	6.67

**Table 1.** Frequency and percentage of participants classified according to the personal characteristics (N = 90).

the more favorable the practice environment for nursing care. The mean score of fall prevention activities was 75.58 (SD = 9.96) out of 100 scores. The detailed results are shown in Table 2.

### 3.3. Factors related to the fall prevention activities of nurses at the hospital

There was a difference in fall prevention activity between gender and place of work, which was statistically significant ( $p < 0.05$ ). Specifically, compared with the male nursing group, the female nursing group had a statistically significantly higher fall prevention activity on average.

Variables (items)	Total score			
	Possible range	Actual range	M	SD
Fall prevention knowledge (11)	0–11	0–10	4.67	2.50
Self-efficacy in fall prevention (11)	11–66	11–66	49.43	8.55
The nursing practice environment (10)	10–40	10–40	29.69	4.00
Fall prevention activities (20)	20–100	47–100	75.58	9.96

**Table 2.** The overall and average scores of the variables knowledge, self-efficacy in fall prevention, the practice environment, and fall prevention activities of nurses (N = 90).

Nurses who worked in the internal medicine department had higher fall prevention activities than those working in the surgical medicine department (M = 3.93 vs M = 3.67,  $p < 0.05$ ). There was a difference between nurses with twice-a-year training compared with nurses with once-a-year training, which was statistically significant (M = 3.97 vs M = 3.74,  $p < 0.05$ ). In addition, other factors in the personal characteristics of participants, including age, professional qualification, work experience, number of patient workload per day, experience with fallen patients, and fall prevention training, were not associated with nurse activities for hospital fall prevention. The detailed results are shown in Table 3.

The results showed a positive correlation between self-efficacy in fall prevention and fall prevention activities ( $r = 0.61$ ,  $p < 0.001$ ), and the nursing practice environment ( $r = 0.25$ ,  $p < 0.05$ ). There was no statistically significant correlation between the knowledge of nurses about fall prevention and fall prevention activities ( $p > 0.05$ ). The detailed results are presented in Table 4.

## 4. Discussion

Most participants were young and female. This was consistent with the reality of nursing in Vietnam,<sup>12,14</sup> as well as in the world. In this study, most nurses had a college or university degree, with only 8.89% of nurses with intermediate qualifications (2-year training); this finding shows that the education level of nurses is improving when compared with previous studies in Vietnam<sup>13,14</sup> and the hospital is increasingly focused on improving the professional qualifications among nurses. This is also consistent with the standardization roadmap for college degrees of the Vietnamese Ministry of Health. In addition, the result showed the heavy workload of nurses every day at the hospital, with 58.89% of nurses having to care for >10 patients

Characteristics	Fall prevention activity			p-value
	Frequency	M	SD	
<i>Age (years old)</i>				0.618 <sup>a</sup>
≤30	42	3.80	0.48	
31–45	41	3.80	0.49	
≥46	7	3.60	0.67	
<i>Gender</i>				0.028 <sup>b</sup>
Male	21	3.57	0.48	
Female	69	3.84	0.49	
<i>Professional qualifications</i>				0.145 <sup>a</sup>
Intermediate	8	3.87	0.40	
College degree	59	3.70	0.53	
University	23	3.94	0.42	
<i>Work experience (years)</i>				0.883 <sup>a</sup>
<3	14	3.85	0.56	
3–5	14	3.78	0.42	
5–10	23	3.72	0.51	
10	39	3.78	0.51	
<i>Place of work</i>				0.017 <sup>b</sup>
Internal medicine	37	3.93	0.46	
Surgical medicine	53	3.67	0.50	
<i>The number of patients taking care per day</i>				0.808 <sup>b</sup>
≤10	37	3.76	0.94	
>10	53	3.79	0.51	
<i>Experience with fallen patients</i>				0.232 <sup>b</sup>
Yes	72	3.81	0.50	
No	18	3.65	0.47	
<i>Fall prevention training</i>				0.513 <sup>b</sup>
Yes	84	3.77	0.51	
No	6	3.90	0.30	
<i>Number of times to participate in fall prevention training/year</i>				0.030 <sup>b</sup>
Once	72	3.74	0.53	
Twice	12	3.97	0.28	

Note: <sup>a</sup>ANOVA; <sup>b</sup>t-test.

**Table 3.** Differences in fall prevention activities between some personal characteristics of nurses (N = 90).

Pearson correlation	Fall prevention activities	
	r	p-value
Fall prevention knowledge	-0.093	0.384
Self-efficacy in fall prevention	0.614	<0.001**
Practice environment	0.251	0.017*

Note: \*p-value <0.05; \*\*p-value <0.001.

**Table 4.** Correlation between knowledge, self-efficacy in fall prevention, practice environment, and fall prevention activities of nurses at the hospital (N = 90).

per day. The experience of contact with patient falls in this study was higher than in previous studies.<sup>10,19,20</sup> This finding evoked the necessity of a greater focus on fall prevention in the hospital. The rate of regular participation in fall prevention training was high in the current study; however, the number of training sessions for fall prevention was only from one to two a year in the current study because of the impact of the COVID-19 pandemic in Vietnam.

In recent years, the health sector has paid great attention to the infrastructure and policies to improve the quality of patient care at the hospital.<sup>21</sup> At the same time, it has enhanced training programs to promote patient safety and minimize incidents affecting patient safety at medical facilities.<sup>22</sup> Specifically, these research results demonstrated that nurses' knowledge about fall prevention has improved compared with that in previous studies in Vietnam.<sup>12,14</sup> However, there is still a clear gap between Vietnam's fall prevention knowledge and that of countries like Korea<sup>9,23,24</sup> or Indonesia.<sup>11</sup> Therefore, the nursing staff's knowledge of patient safety and fall prevention needs to be further improved.

In Vietnam, there was no published research on the self-efficacy of nurses in fall prevention prior to this research. The results in this study showed that nurses were very confident in implementing fall prevention for patients. This was not so disparate from nurses' self-efficacy in fall prevention in other countries.<sup>10,24</sup> This is the strength of nursing to be able to promote practical fall prevention actions and programs in the facility in the most effective way, even though the knowledge of fall prevention was not high in the current study. In the care environment, self-efficacy was nurtured and promoted during the care process when caring for patients who had fallen. However, self-efficacy must be supported by appropriate nursing knowledge and practice to reduce patient falls and increase patient safety.

The nursing practice environment is a surrounding condition that contributes to the level of satisfaction of nurses in their work, thereby promoting the responsibilities of nurses and improving the quality of care for patients. In this study, the average score of the practice environment of nurses was relatively high when compared with previous studies.<sup>9,24</sup> The results showed that the hospital had a reasonable allocation of personnel, the leader can guide the staff and have cooperation, support, and listen to the process of nursing care. Although this was not the highest score in the nursing practice environment, it was the practical environment that can promote development of nurses' capacity and expertise, while improving the quality of care and ensuring the safety of patients at the hospital.

Fall prevention knowledge, and fall prevention activities of nurses in this study showed improvement compared with previous studies in Vietnam.<sup>12–14</sup> This progress reflects increased attention to and improvement in fall prevention to ensure patient safety. However, this result highlights the need for a greater focus on fall prevention activities in Vietnam when compared with nurses in Korea.<sup>10,23,25</sup> Therefore, fall prevention activities need to be maintained and further promoted.

The results showed that gender was a factor influencing fall prevention activities. This result was consistent with the study of Nguyen Thi Thuy and Le Quang Tri with the rate of adherence to fall risk assessment of female nurses being twice higher than male nurses.<sup>12,14</sup> Place of work is a factor influencing fall prevention activities. This result was consistent with the study of Jin Misook and colleagues<sup>10</sup>; this finding may be due to the characteristics of diseases and length of hospital stays. Specifically, each disease in each department may require a different time period of hospitalization. For example, in the internal department, most patients receive treatment for chronic diseases and thus require longer hospital stays than those patients in the surgical departments. Therefore, fall prevention is more focused in settings with longer length of stay.

The results found training to be a factor influencing fall prevention activities. According to Letrud,<sup>26</sup> the ability to remember and retain knowledge decreases over time; the ability to remember will be up to 90% when teaching such knowledge to others, 75% knowledge retention when applying such knowledge to practice, and 5% knowledge retention with lecture only.

Self-efficacy in fall prevention was a statistically significant factor related to fall prevention activities. This result once again reinforced the evidence for a close link between self-efficacy and the activities of nurses in fall prevention as reported in previous studies.<sup>9,19,23</sup> When nurses were confident and aware of the importance of falls and the consequences of falling, fall prevention activities also increased.

Similarly, environmental practice was a statistically significant factor related to fall prevention activities. This result was consistent with the study of Jin Misook and colleagues,<sup>10</sup> and Park Yunhee and colleague.<sup>24</sup> There are many practical issues in choosing a workplace that is commonly valued by prospective employees, more than salary and rewards, but training and

development, colleagues, leadership, as well as policies and regulations in the work environment. These factors impact on an individual's performance and engagement with the organization. Therefore, it is not difficult to understand that when the working environment is comfortable, convenient, coordinated, and has mutual support, the effective leader will contribute to improving the spirit as well as the quality of nursing activities.

Due to time and human resource limitations, and the impact of the COVID-19 pandemic, the study was conducted at one hospital; therefore, the findings cannot be generalized. However, the results are informative to ongoing work to improve nursing care quality and patient safety in the healthcare settings.

## 5. Conclusions

The nurse activities in fall prevention were moderate scores and the factors associated with fall prevention activities were gender, place of work, self-efficacy in fall prevention, nursing practice environment, and number of times to participate in fall prevention training/year. From the findings of the study, the number of fall prevention training per year should be increased and the development of fall prevention education should focus on teaching strategies that enhance retention of knowledge over time. Self-efficacy was statistically significant to fall prevention; therefore, it is necessary to strengthen fall prevention training for nurses, with evaluation and supervision after the training to enhance their self-efficacy. In addition, the hospital policymakers need to pay more attention to building comfortable, convenient, coordinated, and mutual support for the nursing practice environment. Additionally, further research should be conducted with greater scope and focus to develop an intervention program that affects multiple factors to promote fall prevention activities in the future.

## Ethical approval

This study was approved by the Ethics Committee in Biomedical Research of the University of Medicine and Pharmacy at Ho Chi Minh City (No. 824/HDDD-DHYD).

## Conflicts of interest

All contributing authors declare no conflicts of interest.

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