FALL RISK PREVENTION: RELATED FACTORS TO NURSES' PRACTICE AT CU CHI DISTRICT HOSPITAL

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ABSTRACT

Aim: This study aimed to assess the practices of nurses toward fall risk prevention and the related factors at Cu Chi District Hospital. ***Methods:*** This was a descriptive correlational study of 98 nurses. Data were collected by using a structured questionnaire, and logistic regression analysis was used to analyze the data. ***Results:*** The results showed that more than three-fourths of the nurses (84.7%) had good fall prevention practices. Factors related to nurses' fall prevention practices include knowledge, attitude toward fall prevention, age, gender, work experience, department, number of patients cared for per shift, fall prevention training during work, and the demand for updates to fall prevention. The findings of this study can be used to inform managers about factors contributing to fall prevention in nurses' practices and ultimately enhance the quality of patient care and patient safety.

Keywords: *Practice, Fall prevention, Nurses, District hospital*

I. INTRODUCTION

Falls can happen to anyone and are a health issue that requires attention. Falls are a prevalent safety concern in healthcare facilities. The consequences of fall-related injuries contribute to increased treatment costs [10]. Identifying risks and implementing effective interventions can reduce the risk of falls by 20% to 30%, with nursing interventions playing a crucial role in improving the fall rate among hospitalized patients [10]. Good nursing practices in fall prevention can significantly reduce the fall rate among patients. Several reports have indicated that nursing practices for fall prevention are generally good. A study in South Korea [6] reported a correct nursing practice rate of 82.3% for fall prevention, and a similar survey in Vietnam reported a rate of 85% [1].

Nursing staff with good fall prevention knowledge demonstrate better adherence to good practices, and a positive attitude among nursing staff towards fall prevention is a crucial factor influencing their practices [5]. Besides, several other factors also impact nurses' fall prevention practice, such as older nursing staff exhibiting higher adherence to fall prevention practices, and fall prevention training is effective in enhancing the practical activities of nursing staff [7]. This study aimed to survey nursing practices in fall prevention at Cu Chi District Hospital in 2023 and identify related factors.

II. METHODS

2.1. Design

This was a cross-sectional, correlational, descriptive study.

2.2. Sample size and sampling method

This study was conducted at a general hospital in Vietnam, Cu Chi District Hospital. Out of 139 nurses, 104 met the inclusion criteria. However, six were on extended study and maternity leave,

considered as exclusion criteria, resulting in a final sample size of 98. The sample included nurses directly involved in patient care. Exclusion criteria were department head nurses.

2.3. Measurement

Demographic data collected included age, sex, education, experience, position, patient load, fall prevention education in nursing school, fall prevention training during work, working unit, and the need for updated fall prevention knowledge.

Nurses' practice in fall prevention was measured using the "Fall Prevention Activities" toolkit developed by Hwang In Young in 2011 [4]. The toolkit consists of 20 items, using a four-point Likert scale ranging from "Never" - 1 point, "Sometimes" - 2 points, "Frequently" - 3 points, and "Always" - 4 points. Scores of 3 or 4 indicated "good practices," while scores of 1 or 2 indicated "poor practice." Total scores ≥ 64/80 points (≥ 80%) were considered "good practices" and < 64/80 points (< 80%) as "poor practice" [11]. The Cronbach's Alpha reliability of the toolkit in the study was 0.94.

2.4. Data collection procedure

The researcher met with nurses during the nursing endorsement to explain the study's purpose, risks, benefits, and confidentiality. Afterward, the researcher distributed surveys with recruitment statements, inviting willing participants to complete them anonymously. Completed surveys were returned in sealed envelopes to the researcher.

2.5. Data analysis

Participants' characteristics, fall-related education, and practice in fall prevention were analyzed using frequency percentages. Associations were quantified using odds ratio (OR) with a 95% confidence interval (CI). Statistical significance was set at $p < 0.05$, with the CI excluding the value of 1. Data analyses were performed using SPSS 16.0.

2.7. Ethical considerations

The study was approved by the Research and Ethics Committee of Pham Ngoc Thach University (Approval No. 746/TĐHYKPNT-HĐĐĐ, dated 15th November 2022) [4]. Institutional review board approval and permission to use the instrument were obtained. Nurses were informed of voluntary participation and the right to withdraw at any time without penalty. Responses were kept anonymous, with data reported in aggregate to protect department identities.

III. RESULTS

A total of 98 nurses were enrolled in the study. The characteristics of the participants are shown in Table 1.

Table 1. *Characteristics of participants (n=98)*

Characteristics	Frequency (n)	Percentages (%)
Age		
< 30	26	26.5
30 - 40	62	63.3
> 40	10	10.2
Gender		
Male	24	24.5
Femal	74	75.5
Level of education		
Secondary	29	29.6
College	30	30.6

Characteristics	Frequency (n)	Percentages (%)
Bachelor	39	39.8
Work experience		
< 10 years	68	69.4
≥ 10 years	30	30.6
Number of patients cared per shift	42	42.9
≤ 10	56	57.1
> 10		
Types of unit	36	36.8
Medical units	31	31.6
Surgical units	31	31.6
Critical care units		
Position	10	10.2
Charge nurse	88	89.8
Staff nurse		
Fall - prevention education in nursing school		
Yes	87	88.8
No	11	11.2
Fall - prevention training during work		
Yes	81	82.6
No	17	17.4
Demand for updating in fall prevention		
Yes	90	91.8
No	8	8.2

The majority of participants (63.3%) are aged 30 - 40. Most are female (75.5%), and 39.8% have a bachelor's degree. The majority (69.4%) have less than ten years of work experience. Nurses working in medical units account for a higher proportion compared to those in surgical and critical care units (36.8% versus 31.6%). Meanwhile, the nursing workload for over ten inpatients per shift accounts for 57.1%, and 89.8% of participants work as staff nurses.

Most participants (88.8%) reported that they had received education on fall prevention in nursing school during their studies as nursing students. 82.6% of participants were trained in fall prevention knowledge during their professional work. Most of the participants expressed a need for updating and training in fall prevention, accounting for 91.8%.
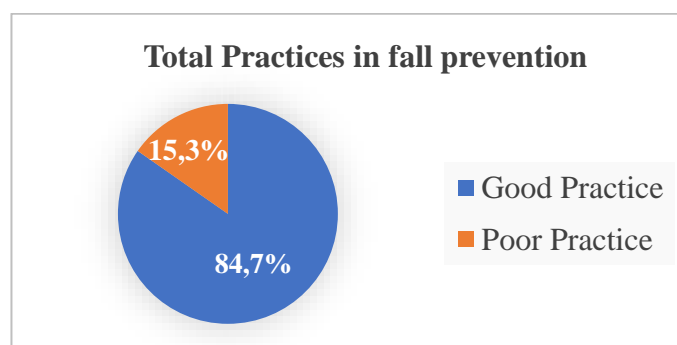

Figure 1. *Total practices in fall prevention (N=98)*

Figure 1 shows that more than three-fourths of nurses (84,7%) have good practice in fall prevention, and the percentage of poor practice is 15,3%.

Table 2. *Nurses' practices in fall prevention (n=98)*

	Fall Prevention Practices	Good Practices n (%)	Poor Practices n (%)
1	Assess fall risk on admission	88 (89.8)	10 (10.2)
2	Reassess fall risk when changes of patient's condition	76 (77.5)	22 (22.5)
3	Assess patients motor function	83 (84.7)	15 (15.3)
4	Attach fall risk signs to records, rooms, and beds for high-risk patients	81 (82.6)	17 (17.4)
5	Provide instructions and reminders patients and caregivers on fall prevention	87 (88.8)	11 (11.2)
6	Raise bed rails for vulnerable patients	93 (94.9)	5 (5.1)
7	Monitor side effects of drugs that may cause fall	88 (89.8)	10 (10.2)
8	Educate patients and caregivers safe moving to bed, chair, bathroom, and wheelchair	90 (91.8)	8 (8.2)
9	Ensure clear walkways	87 (88.8)	11 (11.2)
10	Ensure patients wear non-slip, properly sized shoes	70 (71.4)	28 (28.6)
11	Maintain proper lighting on beds and in bathroom	85 (86,7)	13 (13,3)
12	Place non-slip mats for bathing	76 (77.5)	22 (22.5)
13	Lock wheelchairs brakes during patient transfers	88 (89.8)	10 (10.2)
14	Raise bed rails when moving patients on stretchers	90 (91.8)	8 (8.2)
15	Assist risk patients getting out of bed for the bathroom	71 (72.5)	27 (27.5)
16	Assist unconscious, unstable, post-surgery patients when moving	91 (92.9)	7 (7.1)
17	Ensure that at risk patients walking with a caregiver	85 (86.7)	13 (13.3)
18	Encourage patients to ask for help to prevent falls	86 (87.8)	12 (12.2)
19	Remind fall prevention frequently	84 (85.7)	14 (14.3)
20	Encourage high-risk patients to exercise regularly unless contraindicated	73 (74.5)	25 (25.5)

Results showed that the highest adherence rate in fall prevention practices among nurses was observed for raising bed rails for vulnerable patients, with a compliance rate of 94.9%. Assisting unconscious, unstable, and post-surgical patients during movement was the second most adhered-to practice, with 92.9% of nurses performing it correctly. Two other practices followed closely, each with a compliance rate of 91.8%, including educating patients and caregivers on safe transfers to and from beds, chairs, bathrooms, and wheelchairs, as well as raising bed rails when transferring patients on a stretcher. Conversely, the practice with the lowest adherence was ensuring patients wore non-slip, appropriately sized shoes, with only 71.4% of nurses complying with this measure.

Table 3. *Factors related to nurse's practices in fall prevention (n=98)*

Characteristics	Practices		OR (CI 95%)	p
	Good Practices n(%)	Poor Practices n(%)		
Knowledge				
Good	67 (91.8)	6 (8.2)	6.28	**0.002***
Poor	16 (19.3)	9 (80.7)	(1.95 – 20.20)	
Attitude				
Positive	68 (90.7)	7 (9.3)	5.18	**0.006***

Characteristics	Practices		OR (CI 95%)	p
	Good Practices n(%)	Poor Practices n(%)		
Negative	15 (18.1)	8 (81.9)	(1.63 – 16.49)	
Gender				
Female	67 (90.5)	7 (9.5)	4.79 (1.51 – 15.14)	**0,008***
Male	16 (66.7)	8 (33.3)	1	
Age				
< 30	18 (69.2)	8 (30.8)	1	
30 – 40	57 (91.9)	5 (8.1)	5.07 (1.47 – 17.45)	**0.010***
> 40	8 (80)	2 (20)	1.78 (0.31 – 10.32)	0.521
Level of education				
Secondary	24 (82.3)	5 (17.7)	1	
College	24 (80)	6 (20)	0.83 (0.22 – 3.10)	0.786
Bachelor	35 (89.7)	4 (10.3)	1.82 (0.44 – 7.49)	0.405
Work experience				
≥ 10 years	62 (91.2)	6 (8.8)	4.43 (1.41 – 13.92)	**0.011***
< 10 years	21 (70)	9 (30)	1	
Number of patients cared per shift				
< 10	40 (95.2)	2 (4.8)	6.05 (1.28 – 28.48)	**0.008***
≥ 10	43 (76.8)	13 (23.2)	1	
Types of unit				
Critical care units	21 (67.7)	10 (32.3)	1	
Surgical units	28 (90.3)	3 (9.7)	4.44 (1.08 – 18.18)	**0.038***
Medical units	34 (94.4)	2 (5.6)	8.09 (1.61 – 40.61)	**0.011***
Position				
Charge nurses	9 (90.0)	1 (10.0)	1,70 (0,19 – 14,52)	0.515
Staff nurses	74 (84.1)	14 (15.9)	1	
Fall - prevention education in nursing school				
Yes	75 (87.4)	12 (12.5)	2.34	0.276
No	8 (72.7)	3 (27.3)	(0.54 – 10.09)	
Fall - prevention training during work				
Yes	74 (91.4)	7 (8.6)	9.39	**<0.001***
No	9 (52.9)	8 (47.1)	(2.75 – 32.08)	
Demand for updating in fall prevention				
Yes	80 (88.9)	10 (11.1)	13.33	**0.001***
No	3 (37.5)	5 (62.5)	(2.76 – 64.42)	

The study results indicate a correlation between knowledge, attitude, and practice regarding fall prevention among nurses in Table 3 by using the odds ratio (OR) with a 95% confidence interval (95% CI). The criteria for determining the association include $p < 0.05$ and a 95% confidence interval that does not contain the value of 1. Specifically, nurses with good knowledge have a 6.28 times higher likelihood of good practice compared to those with poor knowledge, which is statistically significant ($p = 0.002$). Nurses with positive attitudes have a 5.18 times higher likelihood of good practice compared to those with negative attitudes, and this difference is statistically significant ($p = 0.006$).

There is a correlation between gender, age, years of experience, and practice in fall prevention among nurses. Specifically, female nurses have a 4.79 times higher likelihood of good practice compared to male nurses ($p = 0.008$). Additionally, nurses in the 30 – 40 years have a 5.07 times higher likelihood of good practice compared to those in the < 30 years ($p = 0.01$).

Furthermore, nurses with ≥ 10 years of experience have a 4.43 times higher likelihood of good practice compared to those with < 10 years of experience (p = 0.011).

The correlation between fall prevention practices among nurses working in different units is statistically significant. Specifically, medical-surgical nurses have an 8.09 times higher likelihood of practicing correctly compared to critical care nurses (p = 0.011). Additionally, surgical nurses have a 4.44 times higher likelihood of practicing correctly compared to emergency nurses (p = 0.038). Furthermore, the study analysis revealed a correlation between the average number of patients cared for per shift and fall prevention practices among nurses. Specifically, nurses caring for fewer than ten patients per shift have a 6.05 times higher likelihood of practicing correctly compared to nurses caring for ten or more patients per shift (p = 0.008).

The analysis results found a statistically significant correlation between receiving fall prevention training/updates during work and the need for updating/training with fall prevention practices among nurses. Specifically, nurses who received training/updates during work have a 9.39 times higher likelihood of practicing correctly compared to those who did not receive such training/updates during work (p < 0.001). Additionally, nurses with a need for updating/training in fall prevention have a 13.33 times higher likelihood of practicing correctly compared to those without such a need, with statistical significance (p = 0.001). However, the study did not find a statistically significant correlation between having received training in nursing school, educational level, nursing position, and fall prevention practices among nurses (p > 0.05).

IV. DISCUSSION
Nurses' practices in fall prevention
Assessing the risk and preventing falls in hospitalized patients is crucial. In Vietnam, fall prevention is one of the criteria for evaluating hospital quality. Research findings indicate that the self-reported rate of nursing practice adherence is 84.7%. Our study's rate of good practice is comparable to that of Yeong Hwa Han's study (86.4% good practice) [7] and Mi-young Cho's study (82.3% good practice) [5]. However, our results are higher than those of Sania Said Ghanim's study, which had a good practice rate of 61% [9] and Le Quang Tri's study had a good practice account of only 22,6% [1], Nguyen Thi Minh Chinh at 48,8% [2].

Preventive measures to reduce fall incidents have shown effectiveness, with compliance rates exceeding 90%. Notably, consistently elevating bed rails for vulnerable groups such as the elderly and unconscious patients achieved a high compliance rate of 94.9%, indicating specialized care for high-risk individuals. Guidance on safe movement to beds, chairs, and bathrooms was also effectively implemented, with a compliance rate of 91.8%, highlighting the importance of training for patients and families. Additionally, maintaining elevated bed rails during patient transfers on stretchers reached a compliance rate of 91.8%, showcasing awareness of the significance of assistive devices in fall prevention. These measures not only protect patients but also enhance trust in the quality of care provided. However, compliance for ensuring patients wear correct-sized non-slip footwear was

only 71.4%, significantly lower than that reported in Saad Mohammad's study at 90.3% [3]. This disparity highlights various challenges in implementing this preventive measure within the healthcare system. Factors contributing to this discrepancy may include differing healthcare procedures, varying levels of staff understanding regarding the importance of non-slip footwear, and inconsistencies in training and supervision. The shortfall in compliance increases the risk of patient falls and potential injuries. Therefore, improving awareness, training, and implementation of preventive measures is crucial for enhancing patient safety and care quality.

Factors related to nurses' practices in fall prevention

The correlation between nursing knowledge and practice in fall prevention ensures that knowledge is effectively applied in practice to ensure safety and enhance the quality of care for patients. The study found a significant correlation between nursing knowledge and fall prevention practice. Nurses with good knowledge were 6.28 times more likely to practice effectively (p = 0.002). These results are consistent with studies by Sania Said Ghanim (2023) [9], Yeong Hwa Han (2020) [7], and Pham Thi Bich Ngoc (2020) [2]. These findings affirm a significant positive correlation between nursing knowledge and practice in fall prevention. This implies that nurses who understand and apply fall prevention knowledge tend to implement preventive measures more effectively. The correlation between attitude and nursing practice in fall prevention is particularly crucial because a positive attitude can lead to increased awareness and commitment to implementing preventive measures, promoting adherence to

procedures, and contributing to creating a safe and efficient patient care environment. Nurses' attitudes can play a significant role in determining outcomes and performance related to fall prevention practices. In our study, we found a significant correlation between attitude and fall prevention practice, with statistical significance (p = 0.006). Nurses with a positive attitude were 5.18 times more likely to practice correctly compared to those with a less positive attitude. This finding, although not novel, once again reinforces the strong relationship between attitude and nursing practice, consistent with previous studies such as Yeong Hwa Han's (2020) [7], Mi-young Cho's (2020) [5], and Kim Sang Hee's (2017) [6]. This indicates that when nurses recognize the importance of fall prevention and the consequences of falls, preventive activities are also heightened.

Gender also influences practices, with female nurses exhibiting higher compliance than males, which is consistent with Le Quang Tri's findings [1]. Nursing involves not only educating patients and being attentive to the surrounding environment but also listening to patients to develop tailored fall prevention plans based on individual personality differences. Female nurses may exhibit better attention to and execution of these practices due to their ability to empathize and connect with patients on a deeper level. Additionally, age plays a role, as nurses aged 30 to 40 demonstrate better fall prevention practices than those under 30, likely due to their greater experience and professional responsibility, consistent with research by Yeong Hwa Han and Kim Sang Hee [6], [7]. Nurses in the 30 to 40 age group typically have more experience in the healthcare field compared to those under 30,

which enables them to have a better understanding of patient care processes and recognize fall-related risk factors. Additionally, nurses aged 30 to 40 often exhibit higher professional awareness and responsibility, focusing more on implementing fall prevention measures. Moreover, work experience is a significant factor, with nurses having over ten years of service being more likely to practice correctly, as observed in studies by Yeong Hwa Han and Kim Sang Hee [6], [7]. Specifically, nurses with over ten years of service are 4.43 times more likely to practice correctly compared to novice nurses (p = 0.11). This difference emphasizes that experience is a crucial factor that helps nurses grasp knowledge and skills through exposure to real-life situations. Experienced nurses possess broad knowledge and confidence, enabling them to apply theoretical knowledge and practical skills accurately and flexibly. The average number of patients per nurse shift also affects fall prevention practice, highlighting the challenges of managing a large workload, and this study yielded similar results to the research by Victoria Bowden [8]. The observed difference may be attributed to the challenges posed by managing many patients per nurse shift, which creates pressure and challenges in implementing fall prevention measures. The level of attention and interaction with patients, the ability to appropriately focus on each case, identify individual patient risks, and utilize resources efficiently play crucial roles in fall prevention practice.

Receiving updated fall prevention training during work significantly influences nursing practice, leading to a better understanding and implementation of preventive measures, as supported by studies by Yeong Hwa Han and Sania Said Ghanim [7], [9]. When nurses are regularly provided with updated fall prevention training, it helps them understand effective methods and measures to prevent patient falls. Additionally, nurses are more likely to practice fall prevention correctly and effectively, thereby creating a safer environment for patients, especially in hospital settings. This contributes to improving the quality of patient care and reducing the risk of falls.

Expressing a demand for training is also linked to better practice, indicating a desire for improvement and understanding of the importance of fall prevention, consistent with findings by Pham Thi Bich Ngoc [2]. The difference can be attributed to the fact that nurses expressing a need for training often better understand the importance of fall prevention and a desire to improve their knowledge and skills to enhance their practice and confidence in implementing fall prevention measures for patients.

Limitations, recommendations for future research, and implications for nursing practice

This study has limitations. Data were collected from one district hospital in Vietnam, and convenience sampling limits the generalizability. Future research should use stronger designs and sampling methods to improve external validity. Additionally, this study primarily assesses knowledge, attitudes, practices, and factors related to fall prevention but does not propose interventions. This highlights the need for training programs to address gaps in

practices among nurses.

The hospital should develop a comprehensive fall prevention training program for nurses, with quarterly sessions

that include both theoretical and practical aspects, focusing on male nurses, those under 30, and those with under ten years of experience. Sessions should highlight patient benefits, encourage experience-sharing, and offer incentives to foster positive attitudes toward fall prevention. Additionally, nursing resources should be allocated based on patient numbers in each department to ensure effective care.

V. CONCLUSION

This cross-sectional descriptive study at a district hospital in Vietnam assessed nurses' practice in fall prevention, revealing that 84,7% of nurses have good practice. Nurses' knowledge and attitudes regarding falls were positively correlated with their practice in fall prevention. Key factors also influencing these practices included gender, age group, work experience, unit type, patient load per shift, updated fall prevention training, and demand for training updates.

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