

## Nurses Assessment of Falling Risk and Barriers of Patient's Safety Measures among Patients with Neurological Disorders, at Tanta University Hospital, 2018

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### Abstract

**Objective:** Fall is one of the major risks among different categories of patients including patient with neurological disorder who is at high risk of falling, which increasing their level of dependency. Nurses' roles in identifying the falling risk and barriers of patient safety became a vital need in order to alleviate those risks and improving patients' safety and to minimize this adverse event. **Aims of the study are to:** identify nurse's assessment of falling risk and barriers of patient safety measures among patients with neurological disorders. **Research questions:** can nurses identify falling risk among neurological patients with different conditions? Does nurses aware about the barriers of applying universal precautions and patients safety in different conditions? What are the interventions methods to overcome these barriers? **Research design:** A descriptive cross sectional research design was used. **Setting:** The study was conducted at center of psychiatric medicine and brain and neurology disease, Tanta University. **Subjects:** finite sample including, all nurses work in ICU and brain and neurology units (46 nurses out of 50) nurses. **Tool:** Two tools were used for data collection. Tool one "Nurses assessment of the factors affecting patient condition", tool two ""Prevention of fall" to assess. **Results:** there was a significant difference regarding insisting of patient to move as barriers of patient's safety. **Conclusion:** the present study finding concluded that: Lack of nurses' knowledge and practice in applying risk assessment of fall and universal precautions due to number of barriers including inadequate facilities and negligence of hospital management. **Recommendations:** application prevention of falling program by hospital management, and establish interdisciplinary team for training programs for staff nurses.

**Key words:** falling risk, barriers of patient's safety, patients with neurological disorders.

### Introduction

Fall is one of the major risks among different categories of patients. This risk increase and became a common adverse event in different acute care settings. This risk if occurred will increase hospital stay that negatively affects the patient and his or her family(Hunderfund, et la 2011).Patient with neurological disorder is at high risk

of falling, thus increases their level of dependency(Huang et la 2016), (Saverino et la 2014) and (Reuben et la 2017). This increasing risk may be related to the effect of neurological disorders mainly in the form of gait disturbance, neuromuscular alteration and loss of balance (Formiga, et la 2016).

Fall may be defined as abrupt, unexpected and unexplainable change in patient position, in which patients come

to the floor unintentionally. This slip can occur anytime anywhere, it has so many different causes including aging process, disturbed level of consciousness, effect of some medications and some medical problems such as postural hypotension, bladder or bowel incontinence and sensory and motor impairment. This fall can results in many different consequences starting with simple bruises and may ends with complicated fracture. Simply, it can be prevented by stressing on applying safety measures for those patients as a part of nursing role with collaboration of patient and the family because these safety measures needs comprehensive application to maximize its effect(Sato,, et la 2018).

In order to implement these safety measures, comprehensive assessment of risk factors of fall and barriers of safety measures application became a vital need. A detailed assessment of the uncommon or unknown risk factors with a comprehensive plan to overcome these risk factors is the key to avoid falling among all patients including patients with neurological disorder (Selge,, et la 2018).

In order to avoid or minimize the burden of fall as an adverse event of patient, family and hospital; smart identification of the common risk factors within patient, hospital environment, hospital resources, system of care and family behaviors. All these risk factors need to be included in the falling prevention plan. After complete risk factor identification, preventive measures can be applied effectively. Nurses' assessment of patient at risk of fall based on identifying level of risk, individualizing patient needs and limitations, identifying patient's history of fall and using of safety devices through daily clinical assessment (Kejururawatan & Malaysia, 2018).

Fall could be accidental (unintentional), unanticipated (unpredictable), anticipated (predictable). Accidental fall that may caused by slipping could be prevented by comprehensive assessment of risk factors within patient and environment and application of the needed corrective actions. The predictable type of fall is the most preventable type because the risk factors are known and corrected properly (Kejururawatan & Malaysia, 2018).

One of the most common obstacles for fall prevention in all types of fall is the proper identifying of all fall risk factors including the hidden part regarding system risk factors as staff shortage of continuous observation or lack of safety infrastructures as bedside rails or side walking rails. To some extent, hospitalization itself tends to increase risk for falling due to its unfamiliar environment (Watson,, et la 2015).

Among hospitalized patients the patients with neurological disorder. The increasing number of falls in hospitals precipitates the need to collect and analyze falls data.

Patients with neurological disorder are crucial group who have a great risk of falling because the effect of the disease or medical treatment. Here, come the vital nursing roles in identifying the risk of falling and barriers of patient safety in order to alleviate those risk factors and improving patients' safety and to minimizing this adverse event.

### **Significant of the study**

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Risk of patients fall is a serious problem. Statistics showed that falls occur in approximately 1.9 to 3% of all acute care hospitalizations. Anywhere, about 2 to 15% of hospitalized patients

experiencing at least falling once. These falls result in serious injuries in more than a quarter of hospitalized patients. Because of these injuries and other effects of fall; cost burden increases on patient and hospital as well (Pearson & Coburn, 2011). Fall also has a role in increasing morbidity and mortality among those patients including patients with neurological disorders. Prevention of patients' falls is a major nursing role through assessing and minimizing risk factors (Simpson et al 2013) and (Jeffrey 2017).

### **Aim of the Study**

**To identify nurses' assessment of falling risk and barriers of patient's safety measures among patients with neurological disorders through:**

1. Identifying factors affecting patient's condition.
2. Assessing the availability of universal precautions for prevention of falls.
3. Identify the factors that lead to falling that related to nursing supervision system.

### **Research questions:**

1. Can nurses identify the falling risk among patients with neurological disorder with different conditions?
2. Are nurses aware of the barriers of applying universal precautions and patients' safety measures in different conditions?
3. What are the interventions/methods to overcome these barriers?

### **Material & Method**

#### **Materials**

#### **Research design:**

A descriptive cross-sectional research design was used.

#### **Setting:**

This study was conducted at the center of psychiatric medicine, brain and neurology disease, in Tanta University Hospital. It was started 10 years ago to serve El Gharbia, Kafr El Shekh, El Monophya, El Boheira and El Dakahlia governorates and the other neighborhoods. The center has four units: brain and neurology, addiction, neurology intensive care and psychiatric units. The neurology brain unit contains 4 rooms, with 11 beds and 25 nurses. ICU nurses are 25 nurses and it contains 22 beds.

This setting was selected because the research coordinator works there and she is interested in patients' safety in the selected units. The unit coordinator is a sister of one of the researchers and she asked her to share in this research.

#### **Subjects:**

The subjects were selected from ICU and brain and neurology units because mostly both units are interrelated in caring of patients with neurological disorders without psychiatric or addiction problems.

Finite sample, including all nurses in ICU, brain and neurology units who were accessible and agreed to participate in the study, so 46 nurses were included in the study out of 50 nurses, the other four nurses were included in the pilot study.

**Tools for data collection:**

Two tools were used for data collection; they were developed by the researchers based on reviewing the related literature. The tools were adopted from CNA AND NSO Nurse (2015) Claim Report Update (Nurses Service Organization 2015) and modified by the researchers. Tool one "Nurses assessment of factors affecting patient condition", tool two "Prevention of fall".

Tool one "Nurses assessment of factors affecting patient condition" it was a self-administered questionnaire and it consists of two parts:

1. **Part one;** demographic data. It included questions regarding demographic profile and some other items regarding nurse education, years of studying nursing, qualifications, working unit in the hospital, experience in neurology nursing and participation in patient safety training programs and sources of information about patient safety.
2. **Part two;** assessment of patient's health condition, it included questions regarding history of fall, general health condition, walking aids and special connections. It contains two open-ended questions regarding barriers of patients' safety in these conditions and how to overcome these barriers. The scoring system for the closed-ended questions was three point Likert scale: 1- Present, 2- Absent, 3- Not applicable.

Tool two "Prevention of fall" it was a self-administered questionnaire and it consists of three parts:

1. **Part one:** Universal precautions (essential health care elements) for the

prevention of falls), it included questions regarding familiarity with the environment, using and functioning of bell/light, safety of bathroom, bed, wheelchair, floor, stairs and patient handling. It includes open ended question regarding barriers of applying safety precautions of prevention of patient falling. The scoring system for the closed-ended questions was three point Likert scale: 1- Present, 2- Absent, 3- Not applicable.

2. **Part two:** Nursing supervision system, it included questions regarding hourly rounding, shift handovers and assistance symbol. The scoring system was three point Likert scale: 1- Present, 2- Absent, 3- Not applicable.
3. **Part three:** Nurses action toward the identified risk factors. it included questions regarding regularly patients assessment, inform patients and families of salient risk factors and documentation. The scoring system was three point Likert scale: 1- Present, 2- Absent, 3- Not applicable.

**Statistical analysis of the data**

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent Quantitative data were described using range (minimum and maximum), mean, and standard deviation. Significance of the obtained results was judged at the 5% level.

**The used tests were  
1 - Chi-square test**

For categorical variables, to compare between different groups

### **2 - Fisher's Exact or Monte Carlo correction**

Correction for chi-square when more than 20% of the cells have expected count less than 5

### **3 - Student t-test**

For normally distributed quantitative variables, to compare between two studied groups

### **4 - F-test (ANOVA)**

For normally distributed quantitative variables, to compare between more than two groups

## **Method**

**The study was conducted as follows:**

A review of the past and current related literature covering falling risk and universal precautions for patients with neurological disorder was done using available references as books, articles, periodicals, journals and scientific web sites to ensure acquainted with the research problem and to develop the study tools. Conduction of the study has two phases preparatory and Implementation.

### **I. The preparatory phase:**

1. Permission to conduct the study was obtained from the Dean of the Faculty of Nursing, Damanshour University and from center of psychiatric medicine and brain and neurology disease, Tanta University
2. Tools were adapted and modified by the researchers after consultation jury of five expertise in medical-Surgical

nursing for content validity of the tool in the Egyptian society.

3. Reliability of the tools was done for overall knowledge regarding using standard precautions using Cronbach's Alpha test, the results was 0.727. It is proven to be reliable ( $r = 0.955$ ).

## **II. Implementation phase:**

1. A pilot study was carried out on approximately 10% of the sample (N=4 nurse out of the sample) to test the clarity and applicability of the tool. Accordingly, the necessary modifications were done.
2. The questionnaire was distributed for data collection to nursing staff in ICU and brain and neurology units after explaining the purpose of the study, the researcher coordinator stayed with the nurses to explain any misconceptions and the expected time for completing the tool was about 30 minutes.
3. Data collect starts in 11/4/2018 and continued for 3 weeks.
4. After data collection is completed, the necessary statistical analysis was done.
5. Guidelines for prevention of risk of falling among neurology patients was developed based on the results of the study and it was handled to all hospital staff especially in ICU and brain and neurology units

## **Ethical considerations:**

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- An informed consent was obtained from all nurses in the two units after explanation of the aims of the study before starting the questionnaire.

- Confidentiality, anonymity and privacy were assured.
- Participation on the study was on voluntary basis.
- All the nurses had the right to withdraw from the study at any time without any drawbacks.

**Results**

**Table (1): Comparison between the two studied groups according to demographic data**

Items	Total (n = 46)		Ward (n = 25)		ICU (n = 21)		Test of Sig.	P
	No.	%	No.	%	No.	%		
<b>Gender</b>								
Male	4	8.7	1	4.0	3	14.3	$\chi^2=1.521$	FE p=0.318
Female	42	91.3	24	96.0	18	85.7		
<b>Age (years)</b>								
Min. – Max.	21.0 – 33.0		21.0 – 33.0		24.0 – 32.0		t = 0.339	0.736
Mean ± SD.	26.76 ± 2.73		26.64 ± 3.28		26.90 ± 1.95			
<b>How many years do you studied nursing</b>								
Min. – Max.	2.0 – 8.0		2.0 – 6.0		2.0 – 8.0		t = 0.174	0.863
Mean ± SD.	4.15 ± 1.30		4.12 ± 0.97		4.19 ± 1.63			
<b>Qualification</b>							$\chi^2=0.104$	0.747
School	0	0.0	0	0.0	0	0.0		
Diploma	0	0.0	0	0.0	0	0.0		
Technical	12	26.1	7	28.0	5	23.8		
BSC	34	73.9	18	72.0	16	76.2		
Master	0	0.0	0	0.0	0	0.0		
PhD	0	0.0	0	0.0	0	0.0		
Others studies	0	0.0	0	0.0	0	0.0		
<b>Years of experience in neurology unit</b>								
Min. – Max.	0.42 – 8.0		0.42 – 8.0		1.0 – 7.0		t = 0.967	0.339
Mean ± SD.	3.86 ± 2.0		4.12 ± 2.10		3.55 ± 1.87			
<b>Did you participate in-service training program related to patient safety</b>								
Yes	5	10.9	1	4.0	4	19.0	$\chi^2=2.667$	FE p=0.163
No	41	89.1	24	96.0	17	81.0		
<b>If yes since</b>								
2014	2	40.0	0	0.0	2	50.0	$\chi^2=4.119$	MC p=0.590
2016	1	20.0	0	0.0	1	25.0		
2017	1	20.0	0	0.0	1	25.0		
2018	1	20.0	1	100.0	0	0.0		
<b>Did you think you need more training about patient safety</b>								
Yes	45	97.8	25	100.0	20	95.2	$\chi^2=1.217$	FE p=0.457
No	1	2.2	0	0.0	1	4.8		

$\chi^2$ : Chi square test FE: Fisher Exact, MC: Monte Carlo t: Student t-test p: p value for comparing between the two groups

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**Table (1):** shows that most of nurses in this study were female (91.3%), their mean age was 26.76 years in the two groups Their mean years of studied nursing was 4.15, most of nurses in both group had BSc (Bachelor degree) in nursing (73.9% ). The mean of years of experience in neurology unit (3.86 ), most of them (89.1%) didn't participate in-service training program related to patient safety and most of their response to need more training about patient safety was yes( 97.8%).

**Table (2): Comparison between the two studied groups according to demographic data 'continue'**

Items	Total (n = 46)		Ward (n = 25)		ICU (n = 21)		$\chi^2$	P
	No.	%	No.	%	No.	%		
<b>Sources of information about patient safety</b>								
Physicians	4	8.7	2	8.0	2	9.5	0.033	<sup>FE</sup> p=1.000
Peers	29	63.0	13	52.0	16	76.2	2.867	0.090
In the class at school	15	32.6	8	32.0	7	33.3	0.009	0.923
Hospital policy	4	8.7	4	16.0	0	0.0	3.680	<sup>FE</sup> p=0.114
Media: TV, radio, internet, magazine, newspaper	20	43.5	6	24.0	14	66.7	8.455*	0.004*
Bulletin of hospital	3	6.5	0	0.0	3	14.3	3.821	<sup>FE</sup> p=0.088

$\chi^2$ : Chi square test <sup>FE</sup>: Fisher Exact p: p value for comparing between the two groups  
\*: Statistically significant at  $p \leq 0.05$

**Table (2)** shows that their sources of information about patient safety for group of ward was peers (52%) , class at school (32%) and Media: TV, radio, internet, magazine, newspaper (24%), while sources of information about patient safety for group of ICU was peers(76.2%), Media: TV, radio, internet, magazine, newspaper (66.7%), and In the class at school (33.3%).

**Table (3): Comparison between the two studied groups according to different parameters**

	Total (n = 46)		Ward (n = 25)		ICU (n = 21)		$\chi^2$	P
	No.	%	No.	%	No.	%		
<b>Barriers of patient's safety in these conditions?</b>								
Inadequate supplies	30	65.2	15	60.0	15	71.4	0.657	0.418
Nursing staff shortage	23	50.0	13	52.0	10	47.6	0.088	0.767
Insisting of patient to move	13	28.3	12	48.0	1	4.8	10.524*	0.001*
Inadequate classification of patients with special needs	1	2.2	0	0.0	1	4.8	1.217	<sup>FE</sup> p=0.427
Inability of patient to move alone	3	6.5	0	0.0	3	14.3	3.821	<sup>FE</sup> p=0.088
<b>How to overcome these barriers?</b>								
Attention of hospital administration	4	8.7	4	16.0	0	0.0	3.680	<sup>FE</sup> p=0.114
Providing adequate supplies	18	39.1	9	36.0	9	42.9	0.225	0.635
providing adequate number of nursing staff	16	34.8	8	32.0	8	38.1	0.187	0.665
Adequate maintenance of the beds	4	8.7	4	16.0	0	0.0	3.680	<sup>FE</sup> p=0.114
Implementing training courses on how to maintain safety and protection in hospital	29	63.0	13	52.0	16	76.2	2.867	0.090
<b>Barriers of applying safety precautions of prevention of patient falling</b>								
Negligence of hospital administration in the application of safety precautions	8	17.4	5	20.0	3	14.3	0.259	<sup>FE</sup> p=0.710
Insufficient number of nurses	19	41.3	13	52.0	6	28.6	2.584	0.108
Inadequate supplies	14	30.4	3	12.0	11	52.4	8.790*	0.003*
Inadequate nurses knowledge	27	58.7	12	48.0	15	71.4	2.584	0.108
Increased patient number	1	2.2	0	0.0	1	4.8	1.217	<sup>FE</sup> p=0.457

$\chi^2$ : Chi square test FE: Fisher Exact p: p value for comparing between the two groups

\*: Statistically significant at  $p \leq 0.05$

**Table ( 3)** This table clears that there were significant difference among both groups regarding insisting of patient to move as barriers of patient's safety in which (  $p = 0.001^*$ ), while there were no significant difference among the other barriers including inadequate supplies, nursing staff shortage, inadequate classification of patients with special needs, inability of patient to move alone, which represent(  $p = 0.418$  ,  $0.767$ , <sup>FE</sup> $p=0.427$ , <sup>FE</sup> $p=0.088$ ) respectively.

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Also this table illustrate that no significant difference among both groups in how to overcome these barriers regarding attention of hospital administration, providing adequate supplies, providing adequate number of nursing staff, adequate maintenance of the beds, implementing training courses on how to maintain safety and protection in hospital (  $p = F^E p=0.114, 0.635, 0.665,$   $F^E p=0.114, 0.090$ ) respectively.

In addition, this table shows that no significant difference among both groups regarding barriers of applying safety precautions of prevention of patient falling including: negligence of hospital administration in the application of safety precautions, inadequate nurses' knowledge, increased patient number in which ( $F^E p=0.710, 0.108,$ ) respectively.

### Discussion

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Fall is a recurring problem among different categories of patients. Incidence of fall varies among different unit of care, where they are higher in the department of neurology and psychology units (**Carroll et al 2010 and Haung et al 2016**).

**Abraham (2016)** recorded that falling was associated with number of risk factors as effect of some medications, advance of age, mental confusion, physical environment, change of mobility or movement, incontinence and lack of neuromuscular coordination.

A study by **Delbare et al(2010)**concluded that when the assessment of the risk of falls depend on the perception and physiology of fall, it leads to better implementation of specific interventions to prevent falls.

Health organization should study and understand the process of the

falling in order to be able to implement evidence based preventive measures of falling (**Berryet al 2017**)

Identifying external factors by comprehensive assessment has a vital role in prevention of fall. Certain interventions for patients with high risk of falling have a significant impact to reduce the fall. For example the use of the patient's own identification badges, the use of green labels in the patient's diagram, an electronic sensor for motion sensor and the non-slip mat next to the patient's bed (**Watson et al 2015**).

**Dibardino, et al(2012)**selected a multidisciplinary team to monitor fall screening process. This team includes physicians, pharmacist, nurses, a research analyst and a system analyst. The nurses have a basic role in this assessment because nurses are the most oriented with patient and hospital environment.

The present study revealed that the most of both group were BSc in nursing sciences, mean years of experience in neurology unit at least three years and most of them did not participate in in-service training program related to patient safety. Moreover, most of them need more training about patient safety. This little number of practical (technical) nurses in this study may be due to their lower level of knowledge and skills that may hinder more efficient work with such group of patients. Their year of experience were three because their period of two years commissioning of work after graduation were in critical care units patient who need special care followed by recruitment in neurology units. So they need to update their knowledge and skills through attending a special training program in their specialty. This result is in line with **Haripersad, (2011)**who found in his study that the majority of the participants who being worked in studied hospital

between six and 15 years' experience. Also the result of his study showed that the number of practical nurses was proportionally low in this hospital.

The present study showed that most of both group gained their information about patient safety through their peers. This may be due to lack of communication between staff nurses and other health care team as physician, physiotherapist and pharmacist. Also there was lack of communication and discussion about patient safety with supervisor and manager. The result in line with **Nassar et al (2014)** who explained that effective communication is very important, it is really needed among all member of the health team, and it has a positive impact in successful application of fall prevention program. **Dotson, (2018)** emphasized that communication increases staff and patient awareness and staff competence and compliance in a successful fall prevention program. The current study also revealed significant difference regarding using of the media which include TV, radio, internet, magazine, newspaper as a sources of information about patient safety. This also may be related to the different types of media that suits lots of health care staff including nursing staff.

The present study revealed that there were no significant difference about barriers of patient's safety in these conditions among nurses responses in both group (ward and ICU) regarding inadequate supplies, nursing staff shortage, inadequate classification of patients with special needs and inability of patient to move alone. There was significant difference regarding patient insistence on movement. The result in this study also illustrated that no significant difference in both groups in how to overcome these barriers including attention of hospital administration, ,

providing adequate supplies, providing adequate number of nursing staff, adequate maintenance of the beds and implementing training courses on how to maintain safety and protection in hospital. Also, the study shows that no significant difference among both groups in barriers of applying safety precautions of prevention of patient's falling, these barriers include negligence of hospital administration in the application of safety precautions, insufficient number of nurses, inadequate nurses knowledge and increased patient number.

The limited number of nurses in this study may be due to the nature of female nurses have official vacations (childcare) which affect the actual number of nurses at work. In addition, the lack of interest of hospital manager and supervisors to search with the staff about the important infrastructure and supplies needed for environment and patient safety. **Haripersad, (2011)** found that (42%) of the participants in his study agreed that safety officer is responsible for environmental rounds to identify unsafe areas that contribute to a fall.

Also the increased number of patient in proportional to limited nurses' number affect the nurses competence to prevent fall as each patients need special care and subsequent insufficient time taken to care for them. Lack of nurses' knowledge also affect awareness to engage in prevention of falling program.

The result of this study is in line with **Haripersad, (2011)**.who found that the number of nurses in ward 32% and 11% in ICU (inadequate nursing staff number). Also his study was congruent with the current study in which both were agreed that every patient has the right to take enough time for care needed for assessment and re-assessment risk factors

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of falling which is not applicable with the presence of staff shortage.

media including television, radio, internet, magazine and newspaper.

### **Answer of study questions**

1. Nurses can identify risk of falling among patients with neurological disorders with different conditions.
2. Nurses are aware of barriers of patients' safety in different conditions.
3. The interventions to overcome these barriers are; attention of hospital administration for providing adequate supplies, providing adequate number of nursing staff, periodic maintenance of the beds and implementing training courses on how to maintain safety and protection in hospital
4. The universal precautions are not used efficiently for the prevention of falls because of presence of some barriers).

- Lack of nurses' application of risk assessment of fall and using universal precautions which is due to number of barriers including:
  - ◆ Inadequate facilities; lack nurses number, non-classified patients with special needs, but the significant difference was present regarding inability of patient to move alone.
  - ◆ Negligence of hospital management in the application of these precautions, insufficient number of nurses, insufficient knowledge among nurses, increased patient number but there was statistical significance as regard inadequate supplies.

### **Conclusion**

Based on the present study finding it was concluded that:

- The majority of the study sample was female with the mean age around 26 years old.
- Their qualification mostly was BSc in nursing and about 4 years' experience in neurology units.
- Most of sample did not participate in in-service training program related to patient safety.
- Sources of information about patient safety mainly their peer with statistical significance regarding

### **Recommendations**

1. Increase hospital management orientation and coordination through application of prevention of falling program.
2. Providing adequate needed supplies, manpower, infrastructure, and efficient maintenance protocol.
3. Establish standard care plan for the initiation and application of appropriate safety measures and interventions.
4. Establish and activation of evaluation committee to monitor nurses' performance in application of fall prevention program.

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