

Vol. 9. No.4. 2020
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Contents available at:

www.crdeepjournal.org

International Journal of Environmental Sciences (ISSN: 2277-1948) (CIF: 3.654)



Full Length Research Article

Fall Prevention in Hospitalized Patients: An Evaluation through the Nursing Outcomes

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ARTICLE INFORMATION

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Article history:

Received: 01-11-2020
Revised: 05-11-2020
Accepted: 15-11-2020
Published: 18-11-2020

Key words:

Fall Prevention,
inpatients, Nursing
assessments, Nursing
Outcomes

ABSTRACT

Globally, and in Kenya falls have become a major significant factor in hospitalized patients. Falls reflect effects of medications, environment hazards and the type of illness. Generally falls can cause devastating effects thus an increase in morbidity rates of hospitalized patients, institutionalization, loss of independence and even death. Falls in adults can affect the self-esteem and confidence of older adults. Falls are recognized once they occur and if reported appropriately. Falls represent one of the major safety incidents in the hospital settings. Nurses play a pivotal role in fall prevention through nursing care interventions, assessment and reassessment of patients focusing on patient individualized outcomes. To evaluate the nursing outcomes of hospitalized patients at risk for falls through nursing outcome classification. A cross sectional study was conducted in one of the private hospitals in Kisumu County, a sample of 70 adult patients admitted into the medical surgical wards were recruited into the study. Data was collected prospectively and three evaluations were done on the nursing interventions given to the patients. Descriptive and analytical analysis was considered using a checklist that had yes/no answers and scored. Patients at high risk for falls were predominantly female (57.1%), in clinical treatment (42.8%), with presence of cardiovascular comorbidities (57.1%) and in use of drugs considered at risk of falls (71.4%). Knowledge on fall prevention and its indicators (66.5%) of the patients was increasing at each level of evaluation. Indicators whose scores improved represented a change in the level of behavior. Findings of this study would contribute to the progress of the knowledge about nursing outcomes through interventions in the context of fall prevention and patient safety (Joint International Commission, 2017). Fall prevention and behavior fall prevention showed significant improvement over days towards behavior change.

Introduction

Globally, falls are a major public health problem. An estimated 646 000 fatal falls occur each year, making it the second leading cause of unintentional injury death, after road traffic injuries. Over 80% of fall-related fatalities occur in low- and middle-income countries, with regions of the Western Pacific and South East Asia accounting for 60% of these deaths. In all regions of the world, death rates are highest among adults over the age of 60 years. Though not fatal, approximately 37.3 million falls severe enough to require medical attention occur each year. The largest morbidity occurs in people aged 65 years or older, young adults aged 15–29 years and children aged 15 years or younger (Finlayson, 2010). In addition, those individuals who fall and suffer a disability, particularly older people, are at a major risk for subsequent long-term care and institutionalization. Falling is a common problem for older adults.

Approximately 30% of persons aged ≥ 65 years suffer a fall each year (WHO, 2008). After 75 years of age, fall rates increase up to 50% per year with an increase in concomitant injury and mortality (Bergen et al 2016). Unfortunately, after an initial fall, the risk of a repeat fall within a year is 66% (Viera et al 2016).

Globally, and in Kenya observations have been made on falls that has become a major significant factor in hospitalized patients. Falls reflect effects of medications, environment hazards and the type of illness. Generally falls can cause devastating effects thus an increase in morbidity rates of hospitalized patients, institutionalization, loss of independence and even death. Falls in adults can affect the self-esteem and confidence of older adults. Falls are recognized once they occur and if reported appropriately (Tinetti., 2003). According to World Health

Organization 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. Fall-related injuries may be fatal or non-fatal depending on the surrounding circumstances. Risk factors for falls include: occupations at elevated heights or other hazardous working conditions, alcohol or substance use, socioeconomic factors including poverty, overcrowded housing, sole parenthood, young maternal age, underlying medical conditions, such as neurological, cardiac or other disabling conditions, side effects of medication, physical inactivity and loss of balance, particularly among older people, poor mobility, cognition, and vision particularly among those living in an institution such as a nursing home or chronic care facility, unsafe environments particularly for those with poor balance and limited vision. (Agency for Healthcare Research and Quality; 2008).

Butcher et, al 2018 demonstrates that fall prevention measures are key components in the care of hospitalized patients and this is done from the aspect of nursing care interventions instituted to our hospitalized patients that provide quality care to our patients. Falls represent one of the major safety incidents in the hospital setting where the role of nursing is fundamental in preventing these events, from risk assessment to outcome evaluation and one of the strategies for evaluating nursing outcomes is the use of Nursing Outcomes Classification (Butcher, Bulecheck, Dochterman, & Wagner, 2018).

Prevention of these events is a worldwide concern, and one of WHO's international patient safety goals is to "Reduce the risk of patient harm from falls" (Joint Commission International, 2017). Patient falls continue to be a top adverse event in hospital settings, often resulting in injury and even death. Although fall risk is more common among elderly and frail patients, any patient can be at risk for a fall due to physiological changes related to medications, surgery, procedures, diagnostic tests, or a medical condition, among other factors. In addition, the patient's location, or physical environment, should be considered as it may be a factor leading to increased fall risk. Despite these risks, many falls are preventable in the hospital's inpatient and outpatient settings. An important element to preventing falls is implementing appropriate measures and interventions for those patients, situations, and locations assessed to be at risk and an evaluation be done to determine the possible interventions for fall prevention (Joint Commission International, 2017).

This study was undertaken with an objective to evaluate the nursing outcomes of hospitalized patients at risk for falls through nursing outcome classification.

Materials and Methods

A cross sectional study was conducted in one of the private hospitals in Kisumu County, with a bed capacity of 70 beds that was working towards the Joint Commission Accreditation. The hospital instituted the patient safety international goals with a patient fall policy and a management plan for fall prevention. The hospital uses a nursing process plan for all patients admitted into the facility depending on patient factors, risk factors and was individualized. Falls in the hospitals were being monitored using clear indicators for quality care of patients. The nurses

were performing the nursing interventions based on the classification of patients from high risk, moderate and low risk for fall. The instrument that was used to monitor the falls in the hospital was the Morse fall scale (Urbanetto et al., 2013). This instrument was applied by the nurses within the first 24 hours of patient's admission (Severo et al., 2019). According to the classification of the Morse Fall Scale patients were treated with specific measures to prevent falls. Among the interventions instituted were risk for fall signal where the patients had a yellow wrist band, prescription of nursing care related to patient assessment, supervision and attention to medication use, educating the patient and family about the risk of falls and about preventive measures (requesting assistance to get out of bed, walking only accompanied, staying with a companion for 24 hours, wearing appropriate shoes); environmental safety (ensuring adequate lighting, keeping raised bed rails, low beds and locked wheels, belongings near the patients by the ward nurse and preventing slippery floors).

Sample Size

The sample consisted of 70 patients, considering the calculation outcomes the improvement of the score of the clinical indicator scales of nursing outcome classification and the correlation of the data basing on the mean scores. The study included patients aged ≥ 18 years, hospitalized in medical clinical and surgical wards of the hospital within 24 hours, with high risk for falls identified by the Morse Fall Scale score applied and recorded in the medical records department. Patients with communication barriers, cognitive impairment and mental confusion, and patients with absolute bed rest were excluded. This last criterion is due to the fact that several outcome indicators evaluated in the study were related to patient mobility, which could not be assessed in bedridden patients. The measurement of the outcome related to knowledge also required that the sample consisted of patients with guidance and cognitive ability.

Procedures

Data collection took 3 months; patients' capture was through an active surveillance carried out by the researchers at the medical clinical and surgical wards of the hospital, based on the inclusion criteria of the study. Clinical and sociodemographic data for sample characterization were collected from the patient's electronic medical record. The selection of the outcomes for the evaluation of patients with high risk for falls was carried out based on nursing outcome classification of the nursing diagnoses of patients as individuals (Moorhead et al., 2018; Moorhead, Johnson, Maas, & Swanson, 2013). An analysis of these results and their respective indicators was also performed, selecting some of them for evaluation based on the main risk factors for falls in the hospital environment (Abreu et al., 2015), as well as the preventive interventions used in the field of study. Thus, nursing outcomes and indicators were selected, which comprised the assessment instrument developed by the researchers. Each outcome had its own indicators, with the respective definitions (conceptual and operational), and the checklist that had yes and no answers for the patient. A pilot study was carried out in a different ward that allowed the improvement of the items and its operationalization and further refinement of the instrument before commencement of the study. The outcomes with the yes and no answers and definition, as well as the respective selected nursing

outcome indicators were:

Safe Health Care Environment– Physical and system arrangements to minimize factors that might cause physical harm or injury in the health care facility. The six indicators were: Provision of lighting; nurse call system within reach; bed in low position; arrangement of furniture to reduce risks based on patient needs; personal belongings within the patient's reach and Fall Risk Alert System (Yellow wristband) as used in the institution's field of study.

Knowledge: Fall Prevention – extent of understanding conveyed about prevention of falls. The indicators were: Correct use of assistive devices; appropriate footwear; correct use of grab bars; when to ask for personal assistance, use of safe transfer procedure ,reasons for restraints, prescribed medications that increase risk for falls, illnesses that increase risk for falls, blood pressure changes that increase risk for falls and strategies to safely ambulate.

Vital Signs – Extent to which temperature, pulse, respiration and blood pressure are within normal range. The indicators were: Body temperature); Radial pulse rate Respiratory rate and Blood pressure.

Medication Response– Therapeutic and adverse effects of prescribed medication. The indicators were: Expected therapeutic effects and adverse effects.

Fall Prevention Behavior – personal or family caregiver actions to

minimize risk factors that might precipitate falls in the personal environment. The indicators were: Uses assistive devices correctly, uses grab bars as needed, uses well-fitting tied shoes, adjusts bed height as needed, asks for assistance and uses safe transfer procedure. This data collection instrument was applied at the bedside of the patient by two research nurses, who were not part of the institution's care team, independently and simultaneously, which also allowed the evaluation of the study. Patients received three evaluations 24 hours apart, the first being performed within the first 24 hours of hospitalization or admission. The patients were also asked if they agreed with the high risk for falls identified by the unit nurse to verify their self-perception. The Safe Health Care Environment outcome was assessed by observing the patient's room, with a checklist that had the yes and no responses to indicate whether the environment was adequate or not for all the indicators.

The study was approved by the research ethics committee of the institution. All participants signed an informed consent form before commencing the study.

Data analysis

All data were entered into spreadsheets and analyzed by the Statistical Package for the Social Sciences (SPSS) version 21.0. The nursing outcomes were analyzed by the yes and no responses of its indicators obtained in each evaluation and obtaining the average percentage scores per indicator.

Results

Table 1. Sociodemographic and clinical characteristics of patients at risk for falls

| Variable | Number/Percentage | Total n=70 |
|---------------------------------------|-------------------|------------|
| Age | | |
| 18 to 45 years | 15 (21.4%) | |
| 45 to 60 years | 20 (28.5%) | |
| Above 60 years | 35 (50%) | |
| Gender | | |
| Male | 30 (42.8%) | |
| Female | 40 (57.1%) | |
| Profession | | |
| Educated | 40 (57.1%) | |
| Not educated | 30(42.8%) | |
| Reason for hospitalization | | |
| Orthopedic/traumatological diseases | 20 (28.5%) | |
| Gastrointestinal tract diseases | 15 (21.4%) | |
| Rheumatological | 30 (42.8%) | |
| Cerebrovascular/neurological diseases | 5 (7.1%) | |
| Other | ----- 40 | |
| Comorbidities | (57.1%) | |
| Cardiovascular diseases | 10 (14.2%) | |
| Endocrine Diseases | 10 (14.2%) | |
| Cerebrovascular Diseases | 10(14.2%) | |
| Others | | |
| Taking fall risk medication | 50 (71.4%) | |
| Antihypertensive | 5 (7.1%) | |
| Antidepressants | 5 (7.1%) | |
| Anxiolytics | | |

Patients at high risk for falls were predominantly female (57.1%), in clinical treatment (42.8%), with presence of cardiovascular comorbidities (57.1%) and in use of drugs considered at risk of falls (71.4%) (Table 1). The high risk for falls of the patients studied was evidenced by the age above 60 years (50%) of the patients. The majority (50%) of the patients

in the sample agreed with the risk assessment performed by the inpatient unit nurse, that is, considered themselves to be at risk of falling. Among the main factors for this, they reported difficulty walking (42.8%), previous falls (28.5%) and lack of balance and/or dizziness (7.1%).

Table 2. Average Score of knowledge: Fall prevention outcome and its indicators

| Nursing outcome and its indicators | Evaluation 1 | Evaluation 2 | Evaluation 3 | Overall Evaluation |
|--|--------------|--------------|--------------|--------------------|
| Knowledge of fall prevention | 35 (50%) | 45 ((64.2%) | 60 (85.7%) | 46.6(66.5%) |
| Correct use of grab bars | 30 (42.8%) | 40 (57.1%) | 45 (64.2%) | 38.3 (55%) |
| Blood pressure changes | 20 (28.5%) | 40 (57.1%) | 50 (71.4%) | 36.6 (52.2%) |
| Strategy to safely ambulate | 35 (50%) | 50 (71.4%) | 55 (78.5%) | 46.6 (66.5%) |
| Appropriate foot wear | 40 (57.1%) | 50 (71.4%) | 60 (85.7%) | 50 (71.4%) |
| When to call and ask for assistance | 30(42.8%) | 60 (85.7%) | 65 (92.8%) | 51.5 (73.5%) |
| Illness that increase risk for fall | 20 (28.5%) | 45 (64.2%) | 55 (78.5%) | 40 (57.1%) |
| Prescribed medications that can increase risk for fall | 20 (28.5%) | 35(50%) | 50 (71.4%) | 38.3 (54.7%) |
| Use of safe transfer procedures | 35 (50%) | 45 (64.2%) | 50 (71.4%) | 43.3 (61.8%) |
| Correct use of assistive devices | 30 (42.8%) | 40 (57.1%) | 45 (64.2%) | 38.3 (54.7%) |
| Reasons for restraint | 15(21.4%) | 30 (42.8%) | 50(71.4%) | 31.6 (45.1%) |

On the average scores of knowledge on fall prevention and its indicators (66.5%) of the patients were knowledgeable, strategy to safely ambulate (66.5%), majority of the patients knew the appropriate foot wear (71.4%), when to call for assistance (73.5%), and half of the patients did not know the reason for restraint (54.1%). Generally the knowledge level

was increasing at each level of evaluation. There was a significant improvement in the averages of all indicators, with changes in the level of knowledge in five out of ten evaluated: knowledge of fall prevention, strategy to safely ambulate, appropriate foot wear, when to call and ask for assistance and use of safe transfer devices.

Table 3. Average score of the Fall Prevention Behavior outcome and its indicators in patients at risk for falls

| Nursing outcome Indicator | Evaluation 1 | Evaluation 2 | Evaluation 3 | Average Score |
|----------------------------------|--------------|--------------|--------------|---------------|
| Uses grab bars as needed | 30(42.8%) | 40 (57.1%) | 45 (64.2%) | 38.3(54.7%) |
| Asks for assistance | 30 (42.8%) | 60 (85.7%) | 65 (92.8%) | 51.6 (73.7%) |
| Adjusts bed height as needed | 20 (28.5%) | 40 (57.1%) | 50 (71.4%) | 36.6 (52.2%) |
| Uses safe transfer procedure | 35 (50%) | 40 (57.1%) | 50 (71.4%) | 41.6 (59.4%) |
| Uses assistive devices correctly | 30 (42.8%) | 40 (57.1%) | 45 (64.2%) | 38.3 (54.7%) |
| Uses well-fitting tied shoes | 40(57.1%) | 50 (71.4%) | 60 (85.7) | 50 (71.4%) |

Indicators whose scores improved represented a change in the level of behavior

Table 4. Average score of the Safe Health Care Environment outcome and its indicators in patients at risk for fall

| Nursing outcome and its indicators | Evaluation 1 | Evaluation 2 | Evaluation 3 | Average Score |
|---|--------------|--------------|--------------|---------------|
| Safe Health Care Environment | 40(57.1%) | 45(64.2%) | 42 (60%) | 42.3(60.4%) |
| Provision of lighting | 50 (71.4%) | 48 (68.5%) | 48 (68.5%) | 48.6 (69.4%) |
| Arrangement of furniture to reduce risks based on patient needs | 45(64.2%) | 50 (71.4%) | 50 (71.4%) | 48.3 (69%) |
| Personal belongings within patient reach | 35 (50%) | 38 (54.2%) | 38 (54.2%) | 37 (52.8%) |
| Nurse call system within reach | 32(45.7%) | 30 (42.8%) | 30 (42.8%) | 30.6 (43.7%) |
| Bed in low position | 30 (42.8%) | 25 (35.7%) | 25 (35.7%) | 26.6 (38%) |

The evaluation on bed in low position and adjustment of the bed wheels was addressed .In general the health care environment was well assessed as in (table 4).

Table 5. Vital Signs and Medication Response outcomes and their indicators in patients at high risk for falls

| Nursing outcomes/indicators | Evaluation 1 | Evaluation 2 | Evaluation 3 | Outcome |
|--|--|-----------------|-----------------|------------------------------------|
| Vital Signs | Slight deviation from normal | Normal | Normal | Normal |
| Body temperature | Slight deviation(0.5 higher) | Normal | Normal | Normal |
| Radial pulse rate | Slightly raised | Normal | Normal | Normal |
| Blood pressure | Slight deviation on the higher side | Normal | Normal | Normal |
| Medication Response | Not compromised | Not compromised | Not compromised | Not compromised |
| Expected therapeutic effects (Antihypertensive) | An increase or reduction of the blood pressure | Normal | Normal | Slight deviation of blood pressure |
| Expected therapeutic effects (Opioid analgesics) | Normal | Normal | Normal | Normal |
| Expected therapeutic effects (Anxiolytics) | Slight deviation from normal | Normal | Normal | Slight deviation from normal |
| Adverse effects | Nil | Nil | Nil | Nil effects |

The Vital Signs outcome was evaluated considering the deviation from normal range. This was rated as normal or abnormal given the parameters. The medication response outcome was evaluated considering the range of vital signs, if at all there was a deviation from the normal parameters. This was rated as compromised or not compromised. The scores indicated that patients remained at the level of slight deviation from normal variation of vital sign parameters and with slightly compromised drug response. There was no significant difference in the responses of these two outcomes or in their indicators in the three evaluations performed.

Discussion

This study evaluated nursing outcomes of hospitalized patients at risk for falls through nursing outcome classification that allowed the identification of patient's knowledge on fall prevention, environmental safety, patient reactions and feedback, and clinical situation while hospitalized. Generally the knowledge level was increasing at each level of evaluation. There was a significant improvement in the averages of all indicators, with changes in the level of knowledge in five out of ten evaluated: knowledge of fall prevention, strategy to safely ambulate, appropriate foot wear, when to call and ask for assistance and use of safe transfer devices. Fall risk screening often involves a tool, which may include a minimal number of yes/no questions that get assigned a numerical score based on the patient's answers. If the results of screening indicate the outpatient is at risk for falls, interventions are implemented to reduce risk while the patient is hospitalized (Fielding et, al 2013). In general, it was observed that patients had limited knowledge about their medication prescription, especially the possibility of medication causing

some undesirable effect. This was rated as compromised or not compromised. The scores indicated that patients remained at the level of slight deviation from normal where there was variation of vital signs parameters and with slightly compromised drug response. There was no significant difference in the responses of these two outcomes or in their indicators in the three evaluations performed.

Therefore, reviewing the patient's prescription, paying attention to times and doses of risky medications, advising patients and family members to recognize and report undesirable effects and supervising the patient during these changes can minimize the risk for falls (CDC, 2017). In general the health care environment was well assessed and found to be adequate and safe.

The outcomes evaluation subsidizes the nurse for the selection of preventive interventions for falls, focusing on the indicators that have the worst scores. By identifying the most critical indicators of the patient's behavior and preventive knowledge, for example, the nurse will be able to prioritize and implement more specific interventions and with a greater frequency to modify what is not yet adequate; while the indicators that have reached the desired scores can be maintained with positive reinforcement to the patient (Lee, 2018).

Patients who agreed with the risk assessment performed by the unit's nurse had a better level of preventive behavior. It follows that if a patient understands their vulnerability to falls and the importance of preventive actions, they may have a more active position for their safety. Similarly, those who incorrectly do not see themselves as vulnerable people are more resistant to

preventive education and may have difficulty following directions (Falvo et, al 2010).

The unknown and unfamiliar environment in which the patient faces hospitalization can aggravate conditions related to physical mobility (balance/gait), eliminations and vision, increasing the risk for falls. Therefore, it is important that, in addition to assessing intrinsic risks to the patient, those related to the environment are also identified and controlled, contributing to the reduction of the event during hospitalization (Victor et al., 2017).

Supervising the environment conditions and intervening when something inappropriate is identified, by requesting review and repair, is also the nurse's role. Risk assessment is considered an essential intervention for fall prevention, guiding the implementation of care and contributing to achieve positive patient outcomes (Severo et al., 2019).

Conclusion

Findings of this study would contribute to the progress of the knowledge about nursing outcomes through interventions in the context of fall prevention and patient safety (Joint International Commission, 2017). This research can support the development of other studies that assess nursing outcomes in different settings and populations that can incorporate and promote teaching based on clinical practice scenarios. The study pointed out that there was adequate patient monitoring and a safe health care environment for the patients. This was from the indicators of vital signs and medication response and that there is a great need to reinforce educational measures for these patients, as they need to refine them considering individual needs, self-perceived risk, autonomy/independence of the condition or comorbidities that they might be having. Fall prevention and behavior fall prevention showed significant improvement over days towards behavior change.

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