A Review of Research on Fall Prevention in Elderly Hospitalized Patients

Yingying Liu[1], Liping Zeng[1], Shengnan Han[2], Huixian Lin[3*]
1. School of Nursing Dali University, Dali 671003, China.
2. Daizhuang Hospital of Shandong, Jining 272075, China.
3. Department of Nursing The Third People's Hospital of Yunnan Province, Kunming 650011, China.

Abstract: With the increasing aging of our population, the proportion of elderly inpatients is increasing year by year, and falls are a common injury in elderly inpatients with increasing incidence. They are one of the leading causes of severe complications and death. Therefore, early recognition of falls in elderly inpatients has become even more critical. This paper reviews the risk factors and protective measures for falls in elderly inpatients to guide the development of clinical fall protection, improve inpatient safety, and promote the harmonious development of the doctor-patient relationship.

Keywords: Elderly Inpatients; Falls; Care

Introduction

A fall is a sudden, involuntary, unintentional change in body position, falling to the ground or a lower plane[1] . The National Cause of Death Surveillance Dataset issued by the Chinese CDC shows that falls are the leading cause of injury-related death among people aged 65 and older in China, with a mortality rate of 67.74 per 100,000, adding to the economic and medical burden on families and society. The incidence of falls in the elderly population is high, with studies showing that 30% of people over 65 fall one or more times per year, and the incidence of falls in people over 80 years of age is as high as 50%[2]. In addition, the incidence of falls is more elevated in hospitals[3], and the incidence of inpatient falls is one of the most critical indicators to evaluate the quality of hospital care management[4] . This study outlines the risk factors and protective measures for falls in elderly inpatients to provide a guiding basis for the preventive care of falls in elderly inpatients and contribute to improving the quality of hospital care.

1. Factors associated with falls in elderly hospitalized patients

1.1 Physiological factors

Degeneration of physiological functions, reduced muscle capacity, gait stability, and balance are the main factors affecting falls in the elderly. It has been reported that the incidence of falls among hospitalized patients with an abnormal ratio is about 38.24% in the elderly[5] .

1.2 Disease factors

Cardiovascular diseases, diabetes, hypertension, etc. are all common diseases in the elderly as they age, and those with these diseases are at high risk of falling in the elderly[6]. Cardiovascular diseases such as hypertension and cardiac arrhythmia can cause blurred vision, darkness and loss of consciousness in a short period, resulting in a dramatic increase in the risk of falls; meanwhile, because of the high sensitivity of the visual and auditory systems, these symptoms may be triggered or aggravated by sudden changes in external environmental stimuli. The audiovisual and other proprioceptive

senses and human balance are closely related. The audiovisual dysfunction makes the patient slow to respond to the sound and color signals of danger alarms, causing the patient's peripheral vestibular function to diminish, leading to falls.

1.3 Drug factors

Prolonged oral use of capillary dilators, sedative sleeping pills, antiglycemic drugs and NSAIDs can affect patients' consciousness, gait and blood pressure, increasing the risk of falls. A cross-sectional study based on U.S. Medicare data showed that the incidence of falls among medication users was as high as 10.29% compared to 5.42% in the non-medication taking population[7] . A prospective case-control study showed that a pharmacist-led intervention to screen for and recommend medications that increase the risk of falls successfully reduced the incidence of falls in older patients by 12.4%[8] .

1.4 Environmental factors

Environmental factors also have a significant impact on the safety of hospitalized patients. Wet floors, uneven floors, poor lighting, obstacles en route, misplaced furniture, and the absence of handrails on toilets or low-floor steps increase the risk of falls in older adults. Studies show that 57.7% of fall place situations during hospitalization for elderly patients are in toilets and 30.8% are at the bedside[9] .

1.5 Psychological factors

Negative psychological conditions, such as depression, frustration, and irritability, can impair the elderly's ability to assess and recognize risky events around them, thereby increasing the risk of falls. Patients with a history of falls are more prone to negativity, inactivity, and fearfulness when moving around, which significantly increases the probability of falls.[10] .

2. Protective measures for falls in elderly inpatients

2.1 Fall risk assessment tool

Accurate assessment of fall risk in older adults is a prerequisite for fall prevention. The Morse Fall Scale, Thomas Fall Risk Assessment Tool, and Johns Hopkins Fall Risk Assessment Scale are commonly used in clinical practice today. Nursing staff can choose different assessment tools according to the place of treatment and purpose of treatment of the assessment target, assess patients' fall risk, and give early interventions to reduce the adverse events caused by falls.

2.2 Health Education

Health education is one of the effective ways to prevent falls among the elderly. Chen Gaofei[11] found that the occurrence of falls was related to the lack of knowledge of fall prevention among the elderly and caregivers through a comprehensive assessment of 65-year-olds, and based on this, the results showed that the incidence of falls among the elderly and the degree of injury was reduced by strengthening fall prevention health education (including guidance on dressing for the elderly, guidance on the use of bed rails, and guidance on the "three steps of waking up"). The difference is statistically significant when compared with the control group. The implementation of health education should be based on guiding the elderly to identify the risk factors in daily life and then targeting the corresponding interventions.

2.3 Application of management methods

Root cause analysis (rootcauseana1ysis, RCA) is a quality management approach that uses an organizational, systematic, retrospective analysis of adverse events as its core concept. Using root cause analysis helps identify the root cause of a patient's fall and then find targeted ways to reduce the occurrence of the fall by addressing the cause. A study by Wu et al.[12] showed that using RCA can accurately find the root cause of falls and has a good effect on reducing patient falls. Liu-Liu

Xu[13] applied RCA to manage fall prevention in female psychiatric patients.

2.4 Fall detection system

Choosing a real-time and efficient fall detection system is crucial to prevent falls in elderly hospitalized patients. A fall monitoring system accomplishes real-time monitoring of falls by monitoring the patient's physiological information and processing the results professionally accordingly. Currently, a wearable fall monitoring system is commonly used in clinical practice. This system usually embeds the device into the patient's cell phone, clothing, accessories, and other locations, collect the body parameters in real-time, and uses the relevant data to determine whether there is a risk of falling. The method is not constrained by physical activity areas and is easy to operate. Ruru Zhao et al.[14] designed a cell phone short message-based fall detection device for the elderly, which can distinguish between regular physical activity and fall events and automatically generate fall alarm signals to improve the efficiency of patient rescue and treatment. However, the accurate recognition rate and effectiveness of the fall detection device are not high due to the complexity and variability of daily human activities and fall situations, and the elderly have not accepted such devices; therefore, only by enhancing the recognition rate and effectiveness of the fall detection system can we benefit elderly patients.

3. Conclusion

The occurrence of falls in elderly inpatients is the result of a combination of factors, but the prevention of falls in elderly inpatients remains a major challenge in clinical care. The study of falls in elderly inpatients should not only analyze the relevant factors and preventive measures but also focus on multi-departmental and multidisciplinary cooperation using a combination of resources and technologies. Only by combining these prevention strategies can patients be better protected from falls. There are many ways to prevent falls in elderly inpatients, all of which can be effective, but there is a lack of appropriate fall management models. In the future, a multidisciplinary fall prevention team should be formed based on the data of elderly inpatients in China. A fall prevention management model should be built for elderly inpatients in China based on foreign experience.

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About the author: Liu Yingying, female, current master's students, cardiovascular nursing direction. About corresponding author: Lin Huixian, female, master's degree, Director of Nursing Department, Master's degree advisor.