

Improving Patient Safety by Reducing Falls in Hospitals Among the Elderly: A Review of Successful Strategies

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Abstract. Patient safety is a main dimension of healthcare quality, considering minimizing, reporting, and analyzing incidents that often lead to avoidable adverse effects. Patient falls among the elderly is a common challenge. To explore strategies for preventing patient falls, a review of literature and a qualitative analysis was conducted. Five strategies were identified: Patient and Staff Education; about risk factors and best practices, Patient Exercise; strengthening body muscles and improving balance, Diagnosis and Treatment of Medical Conditions; vision and balance, Enhancing Surrounding Environment; beds, flooring, rails, and passageways, and Using Information Technology; monitor, alarm, and give feedback on falls and risk situations. Many of the multicomponent programs proved to be cost-effective, considering the extended stays, increased complications, and higher costs of caring for injured patients. The utilization of innovative approaches of big data mining to explore reasons, circumstances of falls, and ways of reducing them are recommended through further research.

Keywords. Patient Safety, Patient Falls, Elderly Patients, Strategies, Hospitals.

1. Introduction

Among the most commonly encountered patient safety challenges is patient falls, especially in the elderly, leading to chronic pain, functional deterioration, physical disability, and death. A patient fall is defined as an unplanned descent to the floor with or without injury to the patient [1]. Hospitalization increases the risk of patient fall because of unfamiliar environment, diseases, and treatments. Elderly patients are three times more likely to fall in the hospital and when this happen, they are over ten times more likely to suffer an injury [2]. Almost 45% of patient falls among elderly lead to some sort of injury and 10% of these lead to serious injuries that end up with a mortality. Falls usually increases the patient's length of stay in the hospital, increases the discharge to a long-term nursing institute, and significantly increases the costs of the healthcare. The operational costs for falling elderly patients, with serious injuries, are US\$13,500 more than regular patients and they stayed 6.3 days longer. In addition to the physical harm and costs, falls may also contribute to emotional injury and decreased quality of life [3]. There are two main measures for monitoring and reporting patient falls; the rate of the total patients falls, and the rate of injurious patients falls per

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1000 inpatient days [1]. Falls input measures include fall incidents, characteristics of falling patients, falls circumstances, and categories of falls [4]. Process measures include the utilization of incidents reporting systems and their usability, acceptance and compliance [5]. Outcome measures include indicators of serious events after falls, such as fractures, delayed patient discharge or patient’s length of stay, estimated costs of patient falls, in addition to measures quality of life following falls [6]. The main objective of this study is to explore effective methods that could form successful strategies for preventing patient falls in hospitals among the elderly.

2. Methods

A review of literature was conducted through searching MEDLINE, EMBASE, CINAHL and Google Scholar for studies including the concepts of Improving, Patient Safety, Preventing, Patient Falls, Elderly. Studies published in English over the last ten years reporting patients 65 years and older were retrieved. Out of 381 identified studies, 34 found to be eligible for review, after screening titles and abstracts for relevance and excluding non-eligible studies by examining full text of the retrieved studies. Inclusion criteria focused on studies describing specific strategies and recommendations for preventing and reducing patient falls among the elderly. Qualitative analysis was used to classify the main strategies of preventing and reducing patient falls.

3. Results

We identified five main strategies for preventing and reducing patient falls among the elderly. 1) Patient and Staff Education; using various approaches and methods to improve awareness of risk factors and follow best practices, 2) Patient Training and Exercise; to strengthen the body muscles, improve balance, and minimize the risk of fall, 3) Diagnosis and Treatment of Predisposing Medical Conditions; which could interfere with vision or vestibular balance function, 4) Enhancing the Surrounding Environment; such as beds, flooring, rails, and passageways, and 5) Using Information Technology; to monitor, alarm, and give feedback on falls and risk situations. Figure 1 shows summary of the strategies for preventing and reducing patient falls.

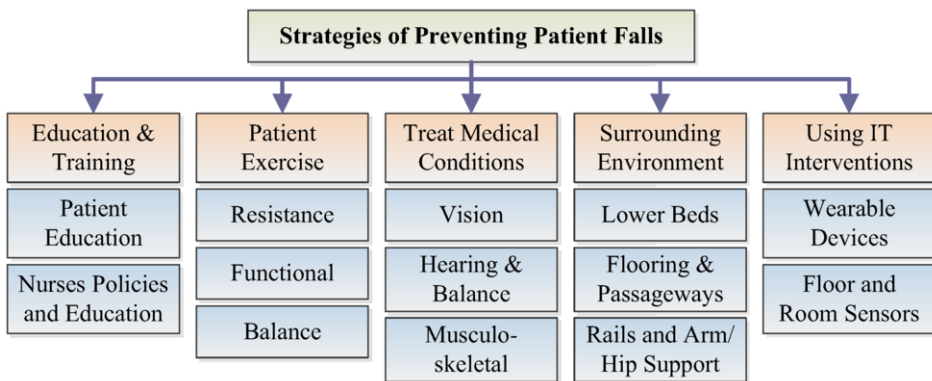


Figure 1. Summary of Strategies for Preventing Patient Falls

4. Discussion and Conclusion

First Strategy: Patient and Staff Education. Education is a fundamental part of falls prevention. In two Australian hospitals, the use of written and video-based educational material in addition to a follow-up by a healthcare professional, e.g. a physiotherapist, to provide information and directions at the patient's bedside proved to be significantly more effective than providing the patient with the educational material only [7]. The conduction of patient education on falls prevention becomes more crucial and effective in the preoperative phase, especially with orthopedic interventions of the elderly [8]. In many hospitals, such educational programs have been proved to be cost-effective, considering the extended stays, increased complications, and high costs of healthcare services provided for patients following falls [9]. Nurses attitude and behavior can significantly influence the success of patient falls prevention programs. Nurses needed to learn about risks of falls, how to educate patients, and what methods of falls prevention are available at their local settings and how they could best use them [10].

Second Strategy: Patient Exercise. Progressive resistance and functional training are safe and effective methods of improving the strength and muscular activity and minimizing fall related behavioral and emotional limitations in elderly patients. Patient exercise, as a single intervention, can prevent falls. Programs that contained balance training and a large amount of exercise for elderly patients had the largest effects on reducing falls. It is recommended that such falls prevention exercise should be taken by patients for at least two hours every week and should target both the general aged population as well as higher risk patients, except for those prescribed less mobility [11].

Third Strategy: Diagnosis and Treatment of Predisposing Medical Conditions. The ability to move and walk safely depends largely on the coordination of motor and sensory functions, such as the vision, vestibular balance, proprioception, and musculoskeletal functions. Therefore, it is important, as a long-term strategy of preventing falls among elderly patients, to diagnose and treat medical conditions that might affect this kind of balance and increase the incidence of falling. These medical conditions include impaired vision due to cataract, vestibular disorders affecting balance, and osteoarthritis [12]. Some older patients may experience higher incidents of falls when they are on sedatives, as these may cause reduced sensorium and impair balance. This brings to the attention the importance of reducing the dose and the close monitoring of these patients [13].

Fourth Strategy: Enhancing the Surrounding Environment. There has been a significant reduction of bed falls as well as injuries from falls after reducing bed heights in geriatric patient wards. Using arm support, rails, and padding of the floors with rubber materials to minimize slipping, in addition to lower beds, can significantly reduce the incidence of falls and the severity of the associated injuries [14].

Fifth Strategy: Using Information Technology Interventions. Wearable sensors have proved to be very useful in monitoring and analyzing the stability of patients. Accelerometers and gyroscopes are the most widespread technologies used to detect stability and balance problems. Such sensors can be placed on the trunk to evaluate both static and dynamic stability [15]. Information technology can also serve the function of analyzing the data of the falls and the associated circumstances to explore the associations between different factors. Some smart phone applications, using their built-in accelerometer and movement detection functions, enable detecting falls, outside the hospital, and starting alarms to reduce their effect. Such applications can also send data, incidents and alarms to healthcare providers instantaneously [16].

As a conclusion; many of the suggested multicomponent programs, of preventing patient falls among the elderly, proved to be cost-effective, comparing the extended stays, increased complications, and the higher costs of caring for the injured patients to the costs of caring for regular non-falling patients. However, the utilization of new approaches of big data mining and the continuous innovation of new methods for exploring the reasons of falls, circumstances and criteria of falls, criteria of the falling patients, and new ways of reducing falls are recommended through further research.

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