

A Fall Prevention Quality Improvement Project in a Long Term Care Facility: Critical Analysis

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Abstract

Falls are a main health burden among seniors, particularly in long term care facilities. A fall prevention quality improvement project was initiated in a geriatric care organization in Ontario, Canada. The purpose of this article is to critically analyze this quality improvement project for reducing fall incident rates by using a Six Sigma model. This quality improvement project consists of conducting a root cause analysis in post fall huddles, "Falling Star" program, and providing fall prevention education for residents and families. The strengths of this quality improvement process include the root cause analysis in post fall huddles and fall prevention education. Some limitations in this quality improvement process include insufficient collaboration with inter-professional team members and the exclusion of residents who are at fall risk, but had not fallen. Three recommendations are provided to increase the possibility of success for this project, including a monthly inter-professional fall safety meeting, the expansion of the "Falling Star" program for all residents at risk of falls, and staff education and training.

Introduction

Falls are a major health challenge among seniors. In Canada, falls lead to 84.8% of all injury hospitalizations for elders 65 years and above, are responsible for 54.4% of all injury-related hospital admissions and 75.7% of all in-hospital deaths due to injury [1]. In addition, falls are the most common cause of unintentional injury in seniors age 65 and older, resulting in 90% of hip and wrist fractures and 60% of head injuries [2]. The consequences of falls significantly affect seniors' daily mobility function and quality of life as well as healthcare costs. Falls are correlated with an increased length of hospital stay, leading to more infections, delirium, and other physical and mental health consequences [3]. Moreover, fall-related injuries bring about significant economic burden to society in addition to pain and suffering for individuals and their families. Each year, the costs of direct health care related to falls among elderly adults are estimated at \$1 billion [1].

Effective fall prevention programs in long term care facilities are important in reducing the costs of direct health care and promoting elderly wellbeing. Falls among seniors are a main health burden, particularly in long term care facilities. Up to 50% of elderly people fall at least once a year in long term care facilities [2]. Falls are the most recurrent significant health issue for older adults over 65, and fall incidents are increasingly highlighted as a safety priority in long-term care facilities [4]. By 2011, Canada's elderly population increased to 5 million, more than 1/3 larger than the elderly population in 1998 of 3.6 million [1]. As the proportion

of the senior population continues to increase, falls prevention programs among seniors are a main public health priority. A 20% reduction of falls would translate to approximately 7,500 less hospital admissions and 1,800 less permanently disabled seniors over the age of 65. This could lead to nationwide savings of \$138 million every year [1].

Evidence-based fall prevention programs are significant in reducing falls and falls-associated injuries among older adults. Fall prevention programs prevent the majority of falls in long term care facilities by identifying possible risk factors [1]. Long term care facilities began to assess potential fall hazards and increased awareness of the need for effective interventions to prevent and reduce the impact of falls on residents [4]. Current literature suggests that evidence-based fall prevention programs are effective. Silva et al. (2013) indicates that physical exercise prevents the likelihood of falls and fractures in elderly adults residing in long term care facilities [5]. Otaka et al. (2016) suggests that fall prevention programs that include the multidisciplinary team, fall risk assessment with feedback, and fall prevention education are effective in decreasing falls. The fall rate dropped 43% in one year, which is comparable with the outcomes of intensive interventions [6]. In addition, effective fall prevention programs require system adjustment and collaboration between the interdisciplinary team as fall related incidents are multifaceted and no individual health care provider is able to create a substantial and sustainable impact on fall-related harms [7].

Fall Prevention Program: Problem, Theoretical Model, and Process

Identified Problem

A fall prevention project is currently underway in a geriatric care organization in Ontario, Canada. This organization is a non-profit serving seniors in the Greater Toronto Area, operating more than 800-bed services in four long term care facilities. The average resident's age was over 80 in 2014. The mission of this organization is to strive for excellence and promote respect, compassion, commitment, teamwork, integrity and accountability. This organization is confronting frequent fall incidents among residents. The quality improvement plan report shows that 11.3% of residents had a fall in the last 30 days. According to Health Quality Ontario (2012), the benchmark percentage of residents who fell in the last 30 days is 9%. Residents with fall incidents in this organization suffered negative physical and psychological consequences, such as fracture, pain, infection, and depression [8]. The organization's Corporate Quality Council initiated the quality improvement project to reduce falls. The target justification of fall rates is the same as or better than Health Quality Ontario's benchmark.

Quality Improvement Model

Six Sigma model is used to guide this quality improvement project. This model has made significant achievements in quality improvement over the past 30 years [9]. Originated by Motorola Inc. in the mid-1980s, Six Sigma is a rigorous statistical measurement methodology designed to reduce cost, decrease process variation, and eliminate defects [10]. Six Sigma is defined as a process-focused data driven methodology aimed at near elimination of defects in all processes which are critical to customers [11]. Six Sigma consists of six themes including (a) customer focus, (b) data driven, (c) process emphasis, (d) proactive management, (e) boundary-less collaboration, and (f) aim for perfection. The model has been widely used in health care management and quality improvement. For example, the Charleston Area Medical Center used this model to evaluate and improve its rate of colon and vascular surgical site infections and demonstrate feasibility and effectiveness [10].

Guided by Six Sigma model, this fall prevention project is designed as a continuous quality improvement process that was modified according to changing client needs. Residents' conditions are dynamic, so the process of quality improvement for fall prevention is adjusted according to residents' needs and residents' situations. Data is collected and analyzed during the process of this project. Six Sigma model diminishes deviation in organizational processes and provides a standardized working process by using quality improvement specialists, a structured approach, and performance metrics to achieve strategic objectives [11]. The quality improvement project emphasizes standardized processes. Six Sigma has a tendency to be a top-down approach, and management assumes a proactive role by selecting quality improvement projects. The Six Sigma role structure is referred to as the belt system, which is a way to standardize improvement competence among the designated staff [11]. Six Sigma requires collaboration between health care providers. Six Sigma methodologies strive to deliver near-perfect services and decrease costs sustained by health care organizations [9].

The Goal and Objective

This fall prevention project is aimed at optimizing a health system's performance by improving the patient care experience, improving the health of the population, and reducing per capita cost of health care [12]. The goal of this fall prevention project is reducing fall incidents, enhancing the resident care experience, improving the health outcomes of residents, and increasing cost effectiveness. In one year, the fall incident rate will reduce from 11.3% to 9%. This quality improvement project also promotes a systemic and evidence-informed approach in fall prevention and post-fall management. Through this quality improvement project, fall prevention strategies and post-fall management can be consistently implemented and evaluated. In addition, fall prevention knowledge among residents and families will increase through fall prevention education.

The Process

The principles of the design of this fall prevention project include evidence-based, client-centered, provider-informed, and corporately-aligned. The planning strategies, methodology, measurement, and strategic outcome are guided by evidence-based practice. Client-centeredness indicates that a continuous quality improvement process should be modified according to changing client needs. The fall prevention project process is adjusted according to residents' needs and situations to account for dynamic conditions. The staff involved in this project should be informed and educated on the project model and related activities, and plan according to timelines. All providers in the circle of care should be informed about the whole project process. The corporately-aligned principle shows that quality improvement activities should reflect the organization's strategic goals. The purpose of this fall prevention project is to enhance resident safety and quality care, which corresponds with the organization's strategic goals of excellent quality care.

This fall prevention project consists of a complicated process, including conducting a root cause analysis in post-fall huddles, a "Falling Star" program, and providing fall prevention education for residents and families. A post-fall huddle is held on the unit in the 24 hours following each fall incident, and is usually held at two o'clock during the day shift. Members of the quality improvement team are expected to attend post-fall huddles, including the Assistant Director of Resident Care, Registered Nurses, Registered Practical Nurses, Physiotherapists, Occupational Therapists, and Personal Support Workers. In post-fall huddles, team members discuss and investigate root causes according to the Post Fall Fishbone diagram. The Post Fall Fishbone diagram contains various issues causing falls and organizes the issues into six aspects, including issues from resident, environment, staff, activity, medication, and equipment. Residents' care plans are updated according to the root causes. The Corporate Quality Council will analyze and compare data on a monthly and quarterly basis. In addition, in the "Falling Star" program, a "Falling Star" logo will be placed on the resident's mobility devices, charts, beside and outside the room doors for those residents who have frequent fall incidents. A "Falling Star" logo functions as a reminder for the care team, students, families, and volunteers to pay extra attention and take caution for those residents with frequent falls. Residents will be discharged from the "Falling Star" program if they do not have any fall incidents over three months. Furthermore, physiotherapists conduct fall prevention exercises education to residents once a week for each

unit. Families will be provided fall prevention education through a pamphlet and newsletters.

Analysis

Quality Improvement Process

Process is strongly emphasized in this fall prevention project. Six Sigma process includes: define, measure, analyze, improve, and control in order to reduce cost, standardize process variation, and eliminate defects [13]. The first step of this quality improvement project is to define the target, which is to have a fall rate less than 9% each month. Second, measures are identified as the percentage of residents who had a fall in the last 30 days. Third, inter-disciplinary team members analyze the root causes of falls for each resident who had a fall at the unit level. The Corporate Quality Council critically analyzes data at the organizational level. Fourth, the Corporate Quality Council develops evidence-based strategies, and unit staff utilizes those strategies and incorporates them into the resident's individual care plan to improve quality care for residents. Finally, the Corporate Quality Council considers best practice and new legislative requirements to control the project, resulting in continuous quality improvement.

This quality improvement process demonstrated two strengths, including the root cause analysis in the post-fall huddles and fall prevention education. The strategy of analyzing root causes of fall incidents is an important first step for fall prevention and post-fall management. The fishbone cause and effect diagram is a scientific sample tool that can be used to help brainstorm and map out possible causes of quality issues [8]. The Corporate Quality Council creates the post-fall fishbone diagram for common causes of falls and potential solutions. By using the post fishbone diagram, the care teams are able to brainstorm, discuss, and investigate the main cause and the sub-causes for the falls of residents during the post-fall huddles. Particular modifiable fall risk factors can be identified through analyzing root causes in post-fall huddles, which include medications, mental condition, mobility status, continence needs, and so on [14]. The Corporate Quality Council also adjusts the fishbone cause and effect diagram after analyzing data and receiving feedback from the care teams. The individualized care plan for fall prevention can be revised for residents with fall history according to the root cause analysis. The other strength of this quality improvement process is a fall prevention education program for residents and families. Evidence suggests that positive consequences of fall prevention interventions could result from active educational engagement of patients and their families [15]. By engaging patients and their families through an effective fall education program, they are empowered to play active roles in fall prevention. In this quality improvement project, patients' safety awareness and self-management skills are enhanced through fall prevention.

There is also a defect in the process. The post-fall huddles and "Falling Star" program are beneficial for residents who have had falls; however, these two programs do not consider residents who are at fall risk, but have not fallen. Individualized care plans for falls are revised only for residents with a fall history. The fall risk issues of residents without a fall history have not been addressed in this quality improvement project.

Roles of Quality Improvement Team Members

Management staff members assume leadership roles in this quality improvement project for reducing fall incidents. Management's strengths include developing evidence based falls prevention strategies. Their role involves facilitating post-fall huddles, "Falling Star", and education. They analyze and compare fall incident data and offer monthly fall incident information updates to the inter-disciplinary team. Management faces limitations, including the validation of accurate data. All data for this quality improvement project is provided by front line working staff. Some data may be inaccurate due to insufficient skills or experience of the frontline workers.

Physiotherapists and occupational therapists are also involved and contribute to this quality improvement project. The physiotherapist assesses physical ability, and develops and implements individualized falls prevention plans. Physiotherapists provide suggestions to nursing staff for post-fall management. In addition, physiotherapists conduct exercise education to residents for fall prevention. The occupational therapist assesses residents' Activities of Daily Living functions and needs for assistive devices. Occupational therapists conduct transfer assessments when residents have a fall incident due to transferring. In addition, occupational therapists provide recommendations for reducing fall incidents according to their professional specialities. For instance, occupational therapists suggest the most suitable assistive mobility devices for residents. However, the limitation of physiotherapist and occupational therapists' roles in this quality improvement project include inadequate support for residents due to the lack of manpower. One physiotherapist and occupational therapist are responsible for multiple units, and they only provide support for residents upon referral from nurses.

Nursing staff assume an important role in this fall prevention project. The nursing role involves providing detailed information of residents' situations and participating in uncovering root causes for residents' fall incidents. Nursing staff also actively develop and implement individualized fall prevention plans according to fall prevention strategies. Nurses actively participate in post-fall huddles to analyze root causes that are associated with residents' changing conditions, such as behaviors, infections, or worsening bladder continence. Nurses also provide detailed information on fall incidents and residents' recent health conditions. In addition, nurses update "Falling Star" signs in a timely fashion and initiate individualized care plans to decrease the risk of falls for residents.

A limitation of this quality improvement project is insufficient collaboration with other inter-professional team members, including physicians, pharmacists, activity workers, and dieticians. Nurses could play a collaborative role with in the interdisciplinary team. Nurses could suggest that the physician and pharmacist review the residents' medication that may contribute to a fall risk. Nurses could report any underlying health situations that are associated with falls, such as pain, infections, or vision deficit. Nurses could suggest that the physician and dietician consider the use of Vitamin D and Calcium to prevent or treat osteoporosis for residents with fall risk. In addition, nurses could collaborate with the physiotherapists and occupational therapists to ensure

that residents correctly and consistently use ambulation devices. Nurses could communicate with personal support workers about residents at high risk of falls and ensure they complete safety checks as part of the care plan. Furthermore, nurses could also communicate with the facility's maintenance department about any issues that interfere with a safe environment, such as broken handrails and clutter.

Recommendations

Through analyzing the strengths and limitations in this quality improvement project, there are three recommendations that enhance the probability of reaching the goals of reducing fall incidents. First, the inter-professional fall safety meeting should be conducted monthly in addition to post-fall huddles. Fall-related harms have multiple factors, and successful fall prevention needs inter-professional collaboration [7]. The inter-professional fall safety meeting should include a physician, pharmacist, nursing champions, activity worker, physiotherapist, occupational therapist, dietician, and nursing management. The quality improvement team requires a diverse multidisciplinary structure, and the team will benefit from their effective roles in fall prevention and management [7]. During the inter-professional fall safety meeting, the team will be updated and discuss the residents' health condition changes that may contribute to a fall, including medication, behavior, level of consciousness, mobility, and infections. According to Leone and Adams (2016), regular meetings are significant for discussing results and updating resources and strategies on a continuing basis in order to maintain active long-term fall prevention [14]. Each disciplinary representative will monitor the residents' conditions according to the respective professional accountabilities and provide discipline-specific fall prevention interventions. Also, the team will discuss additional strategies for residents who had frequent falls according to the root causes. Nursing management will record meeting notes for the inter-professional team members to review and provide additional feedback on fall prevention interventions [16].

Second, the "Falling Star" program should be applied to all residents at risk of falling including residents without a recent fall history. Visual symbols are suggested for patients who are at fall risk, serving to clearly notify all care providers and visitors [14]. All caregivers will pay extra attention to those residents who are at risk of falls. The use of visual cues as a method for labeling patients at fall risk is significant for follow-through and immediate identification and interpretation [14]. Residents with fall risk will be easily recognized when they are identified with a "Falling Star" logo.

Third, nursing staff should be provided training on using critical thinking skills to identify contributing fall factors and implement fall intervention strategies for residents who have no history of falls. The optimal approach of staff education could reduce fall incidents and fall related injuries [17]. Professional training on fall prevention strategies is important for nursing staff professional development as well as quality improvement [18]. Professional training should include fall risk assessment, fall risk factors identification, and post-fall management. After completing a fall risk assessment and identifying risk factors for residents at fall risk, the interventions can be developed and combined with the identified risks [14]. The quality improvement project for reducing fall incidents will be more effective when nursing staff

are equipped with more knowledge, skills, and judgment on fall prevention and management.

Conclusion

The quality improvement project for reducing fall incidents is significant for enhancing residents' safety and improving quality care. Six Sigma model can be used to guide the quality improvement project process. The strengths of this quality improvement project include the root cause analysis in post-fall huddles and fall prevention education. The limitations of this quality improvement project include inadequate collaboration with other inter-professional team members and disregarding residents without a fall history. The recommendations for this quality improvement project include conducting inter-professional fall safety meetings, adding residents at risk of falling in the "Falling Star" program, and providing training for nursing staff [19].

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