Initiation and Evaluation of a Research-Based Fall Prevention Program

Amy Mosley, MEd, RN, Daisy Galindo-Ciocon, PhD, ARNP, Norma Peak, RN, and Myrion Jo West, MSN, RN* 

ABSTRACT. This study evaluated the effectiveness of research-based interventions in preventing falls. The interventions were based on research studies, experts’ opinions, and a pilot study. Thirteen units (72%) had reduced fall rates. The fall rate two years before (\( O = 7.07; SD = 1.7 \)) and two years after (\( O = 6.33; SD = 1.731 \)) the intervention was significantly different at \( p < 0.003 \). Sixteen patients who fell were at risk (fall assessment score = 17.4 ± 5.3) and had a history of falls. The most common site for falls was at the bedside. Most falls occurred during walking, climbing over the side rails, and accidentally rolling out of bed. Thus, a research-based fall prevention is effective in reducing falls.


The occurrence of falls is always a clinical safety issue in any institution. Among older people, falling is a challenging problem with potentially serious consequences and morbidity. \(^{1,2} \) This is one of the leading causes of death among older persons. \(^{3} \) An older person who falls also is at significant risk for disability, injury, and consequently, institutionalization.

Studies show that certain factors place an older person at risk for fall. \(^{4,5} \) These factors are categorized into two main groups: intrinsic and extrinsic.

Some of the key intrinsic factors include functional disability, \(^{6-8} \) gait patterns in relationship to ground surfaces and shoes, \(^{9,10} \) drug regimen, \(^{11,12} \) nutritional status, \(^{13} \) and the psychosocial aspects of falls such as family support or lack of it, declining cognitive status, and marital status. \(^{14} \) The limitation in clinical functional ability has been associated with greatest risk for falling ability. \(^{5,8} \) Certain interventions have been geared towards improving these intrinsic factors. Exercise has been shown to improve gait dysfunction. \(^{15} \)

Although most falls have key intrinsic factors attributed to them, studies have shown that certain extrinsic factors also play a role in the occurrence of falls. The environmental condition, \(^{14} \) the inappropriate use of assistive devices, \(^{9} \) the placement of bedrails, \(^{16} \) and the ground surface are all reported to be contributing extrinsic factors. \(^{17} \)

Fall Prevention

Several studies have focused on developing an educational fall prevention program for older people. \(^{18-22} \) Specific approaches also have been evaluated such as the use of fall consult service, \(^{24,25} \) the use of alarm systems, \(^{26} \) and the efficacy of exercise programs in the prevention of falls. \(^{27} \) Although proposals for fall prevention abound, results remain inconsistent and sometimes conflict from institution to institution. \(^{28} \) These inconsistencies may indicate that preventive measures should be designed based not solely on previous research findings but also on the particular needs of the patients in the facility. If research findings are to be utilized to propose fall preventive strategies, it is vital that a systematic approach to the evaluation of falls be conducted to determine the effectiveness of the prevention strategies.

In Veterans Affairs Medical Center (VAMC), Miami, Florida, a pilot study of a research-based intervention to prevent falls was initiated in 1993–1994. The initial implementation of this pilot intervention had shown an overall 8 percent decrease in fall rate. Encouraged by this finding, a policy on fall prevention was developed.

The purpose of this study was twofold: (1) to evaluate the effectiveness of the newly initiated, research-based fall prevention program as measured by the rate of falls and (2) to describe fall incidents while the fall program is in effect.

Methodology

The research-based fall prevention program was written based on an extensive review of literature on fall prevention, on experts’ opinions, and on pilot fall prevention interventions at a VAMC (Miami). The committee for research utilization reviewed this program prior to initiation.

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*Amy Mosley is Chief Nurse and Assistant Professor at the Nursing Service, Veterans Affairs Medical Center, Miami, Florida. Daisy Galindo-Ciocon is a Nurse Researcher and Assistant Professor at the Nursing Service. Norma Peak is a Staff Nurse at the Nursing Service. Myrion Jo West is SC 1 Service Line Manager, Veterans Integrated Service Network, Department of Veterans Affairs, West Roxbury, Massachusetts.
Inservice Program

A structured education inservice on fall prevention (1 hour/week for four weeks during every shift) was initiated for the nursing staff. This inservice included identification of patients who were at risk for falls, an in-depth evaluation of patients after being identified at risk, and the implementation of intervention.

Identification of Patients at Risk for Falls

After meeting the criteria on the initial assessment during the admission process, a patient is further evaluated using the “fall assessment form,” developed by Berryman, et al.29 This assessment was completed within eight hours of admission to the medical center. Patients who scored 10 or above were classified as at risk for falling. When identified as “at risk,” the following protocols were followed:

1. reassessment for risk of falls either with any change in activities or medications or every month, whichever was more frequent
2. statement of the problem/need on the plan of care
3. documentation of the plan of care that reflects individualized and measurable interventions
4. implementation of the following measurable interventions after the patient is identified as “at risk”:
   a. placement of “Risk for Fall” stickers on the chart and bed and placement of a green dot on the nursing care plan and on the identification bracelet
   b. placement of a green sign on the door if the patient has fallen while in the hospital
   c. education of the patient to include:
      • dangling before standing
      • standing up slowly
      • calling for assistance
      • awareness of the environment
   d. maintaining low bed position
   e. while in bed:
      • usage of split bed rails with bottom part down
      • ensuring that the call light is within the patient’s reach and is in working condition
      • using a dim light at night
      • assisting the patient to the bathroom to void at least every four hours when awake, before bedtime, and before administering sedation
      • placing confused patients and patients identified at risk near the nurses’ station where they can be closely monitored
   f. when out of bed:
      • identifying patients who have orthostatic hypotension and instructing them to:
        1. rise slowly from lying or sitting position
        2. dangle before walking
      • instructing the patient in a wheelchair, chair, or stretcher to call for assistance before getting up, and instructing roommates to call the nurse if an at-risk patient attempts to get up
      • maintaining close supervision of confused patients
      • ensuring that patients wear properly fitting shoes, slippers with nonskid surfaces
      • arranging furniture and objects so there are no obstacles along the path and removing unnecessary furniture from the room
      • developing a high-risk-of-falling plan of care with the patient and family
      • encouraging use of family/sitters to stay with high-risk or confused patients
      • placing an instructional poster in the rooms of high-risk patients
      • encouraging the buddy system, in which a patient’s roommate is encouraged to call a nurse when his “buddy” is attempting to get out of bed or chair without assistance
      • assessing the effects of medication that would place a patient at risk for falling

All the service chiefs received a memorandum outlining the fall prevention program and requesting their cooperation. All inpatient units were included in the study. Education and implementation began with the extended care units (four nursing home care units, one spinal cord injury unit, two intermediate care units). Acute medical and surgical floors (four medical, two surgical, and three critical care units) and psychiatric units (five units) were phased in at three-month intervals. This timeframe was designed to allow adequate time to inservice the staff.

Analysis

The mean fall rate two years before and two years after implementation of the structured fall prevention program was compared using student’s t test for the dependent group. A probability level of p < 0.05 or less was considered significant.

Second Phase

The second phase of the study was a retrospective chart review and an analysis of fall incidence in one preselected unit, unit “L,” while the fall program was in effect. The medical records of patients who had recent falls on unit “L” were reviewed. A checklist was used to determine the patient’s risk factor assessment scale score. This also helped identify intervention received by the patient and describe the possible contributing factors to the occurrence of falls. These factors included the site of fall, the condition of the site, and
the circumstances surrounding the fall. Descriptive statistics were used to describe fall incidence.

**Results**

Thirteen units (72%) experienced a reduction in the number of falls. The mean fall rate two years before \((O = 7.07; SD = 1.731)\) and two years after \((O = 6.33; SD = 1.731)\) the implementation of the fall prevention protocol was significantly different at \(p < .003\) (see Table 1).

A total of 16 falls from unit “L” were reviewed during the second phase (see Table 2). All 16 patients were identified at risk with their Fall Assessment Score \((O = 17.4 \pm 5.3)\) and all patients had a history of falling. The medical record indicated that the protocol had been implemented. Factors contributing to the falls varied (see Table 2). The most common site for falls was at the bedside, followed by the bathroom. The activities of the patient who fell included walking or ambulating alone, climbing over the siderail, and accidentally rolling out of bed while sleeping. Six months after the study was completed, the institution continued to use the intervention program and noted an additional 35 percent decrease in the number of falls.

**Table 1**

<table>
<thead>
<tr>
<th>Mean Fall Rates in Pre- and Post-Fall Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre policy</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Standard deviation</td>
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</tbody>
</table>

**Significant at \(p < 0.003\). Pre policy = mean of two years fall rate before policy. Post policy = mean of two years fall rate after policy.**

**Table 2**

<table>
<thead>
<tr>
<th>Factors Affecting Recurrence of Falls in Unit “L”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects (N)</td>
</tr>
<tr>
<td>Met criteria for fall assessment</td>
</tr>
<tr>
<td>History of falls PTA</td>
</tr>
<tr>
<td>Fall Assessment Score</td>
</tr>
<tr>
<td>Environment</td>
</tr>
<tr>
<td>1. Not wearing shoes</td>
</tr>
<tr>
<td>2. Tripped</td>
</tr>
<tr>
<td>3. Slippery</td>
</tr>
<tr>
<td>4. Lower half side</td>
</tr>
<tr>
<td>5. Bathroom grab rails missing</td>
</tr>
<tr>
<td>Place of fall</td>
</tr>
<tr>
<td>1. Bedside</td>
</tr>
<tr>
<td>2. Bathroom</td>
</tr>
<tr>
<td>Activity during fall</td>
</tr>
<tr>
<td>1. Walking</td>
</tr>
<tr>
<td>2. Transferring</td>
</tr>
<tr>
<td>3. Climbing over the siderail</td>
</tr>
<tr>
<td>4. Sleeping</td>
</tr>
</tbody>
</table>

**Patient-Related Barriers**

The analysis of falls in unit “L” identified some barriers encountered in the implementation of the protocol. These barriers were seen in the following cases:

- In one case, it was difficult to gain complete compliance from a confused patient.
- Patients unlock brakes of wheelchairs themselves and frequently do not relock them for transferring.
- Patients who wore socks to bed frequently forgot to put shoes on before arising and consequently slipped when in the process of getting out of bed.
- One incontinent ambulatory patient slipped on his own urine.
- Some patients refused to call for assistance when getting out of bed or when in the bathroom. Both locations were found to be the most common location for falls.
- Some patients whose room assignments had been changed recently had expressed disorientation as to bathroom location and unfamiliarity with the surroundings.
- Patients missed some of the required interventions (such as physical therapy) due to not being ready at the scheduled time, refusal to go, or a setback in medical condition.
- Patients frequently forgot the proper use of prescriptive assistive devices, such as walker, cane, crutches, and wheelchair, especially when not followed up by physical therapist (PT) or KT.
- One patient, in his attempt to learn how the bed control works, ended up placing himself in Trendelenburg position and consequently slid out of the bed.
- Some patients knocked call bells on the floor or pulled the cord out of the wall, making them unable to call for assistance.
- Some patients complained when the light over the sink or the bathroom light was left on. On several occasions, the lights were found turned off.
- Urinary urgency was noted to be a contributing factor in failing to seek assistance. When patients called for a bedpan, they usually had already soiled the bed and had fallen while attempting to get out of the soiled bed. In addition, external catheters were frequently pulled off and Foley catheters were occasionally pulled out. Some patients refused to use external catheters in spite of staff’s assessment of need.
- Patients initially not identified as at risk were not reassessed when prescribed new medications.
- Some patients fell between 30-minute observation rounds.
- Patients were noted to take shoes and slippers off after the nurse had assisted the patient to dress.
- Wheelchair-bound patients wanted their wheelchair in sight. Rooms frequently become crowded...
with wheelchairs, geri chairs, tray tables, and bedside stands. This created the environment more risky for falls.

- The buddy system worked when both patients were awake, but when the "buddy" slept, he or she may not have realized his or her "buddy" was out of bed until the patient fell. Some "buddies" were noted to assist the patient out of bed or put the side rail down for him or her.
- Protective devices used were geri chairs, out of which patients can climb or slip.

Other factors that made the intervention less effective included:

- Green stickers for high risk were peeled off the bedside chart and not replaced.
- When the identification bands got wet in the shower or tub, the dot either fell off or was not recognizable.
- In other situations, care plans were taken off the charts and filed by the ward clerk.

In spite of these limitations, this unit "L" experienced a reduction in the fall rate.

Discussion and Nursing Implications

In this study, the reduction in the fall rate was statistically significant, with 72 percent of the units experiencing a reduction in their falls. The clinical implication of this reduction in fall rates is indicative of greater benefits. Fewer falls have been associated with less injury, greater independence, maintained mobility, and less cost. Also, it is important to add that concurrent with the implementation of the fall prevention program, a "restraint-free" environment was being implemented. Other service departments had been involved and had cooperated. Other similar studies involving other disciplines have seen significant findings.

Research utilization is the best way to establish standards of care. It behooves nurses to continue to evaluate the effectiveness of research utilization and appropriateness to a particular client be it the patient, the family, or the institution as a whole.

References


Exercise for Article 14

Factual Questions

1. Is "drug regimen" classified as an intrinsic or extrinsic factor in placing an older person at risk for falling?
2. What is the second research purpose explicitly stated by the researchers?

3. Were any of the inpatient units excluded from the study?

4. What was the mean fall rate for the two years after implementation of the fall prevention protocol?

5. Was the decrease in the mean fall rate statistically significant?

6. What was the most common site for falls?

7. Was the difference between the Pre policy mean and the Post policy mean statistically significant?

Questions for Discussion

8. The researchers refer to their research as a “pilot study” in line 45. Do you agree? Why? Why not?

9. The researchers conducted an analysis of fall incidence in one preselected unit, known as unit “L.” Would you like to know more about the selection of this unit? Explain. (See lines 159–162.)

10. There was no control group. In your opinion, would it be important to include one in future studies of this type? Explain.

11. To what population(s), if any, would you be willing to generalize the results of this study?

12. If you were to conduct another study on the same topic, what changes in the research methodology, if any, would you make?

Quality Ratings

Directions: Indicate your level of agreement with each of the following statements by circling a number from 5 for strongly agree (SA) to 1 for strongly disagree (SD). If you believe an item is not applicable to this research article, leave it blank. Be prepared to explain your ratings.

A. The introduction establishes the importance of the study.
   SA 5 4 3 2 1 SD

B. The literature review establishes the context for the study.
   SA 5 4 3 2 1 SD

C. The research purpose, question, or hypothesis is clearly stated.
   SA 5 4 3 2 1 SD

D. The method of sampling is sound.
   SA 5 4 3 2 1 SD

E. Relevant demographics (for example, age, gender, and ethnicity) are described.
   SA 5 4 3 2 1 SD

F. Measurement procedures are adequate.
   SA 5 4 3 2 1 SD

G. All procedures have been described in sufficient detail to permit a replication of the study.
   SA 5 4 3 2 1 SD

H. The participants have been adequately protected from potential harm.
   SA 5 4 3 2 1 SD

I. The results are clearly described.
   SA 5 4 3 2 1 SD

J. The discussion/conclusion is appropriate.
   SA 5 4 3 2 1 SD

K. Despite any flaws, the report is worthy of publication.
   SA 5 4 3 2 1 SD