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Evaluation of Nurse Delirium Screening and Intervention for Hospitalized Older Adult Hip Fracture Patients

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University of Nebraska Medical Center

College of Nursing

Doctor of Nursing Practice (DNP)

Final Scholarly Project

Evaluation of Nurse Delirium Screening and Intervention for Hospitalized Older Adult Hip

Fracture Patients

Collaborating Agency - Methodist Hospital

by

Mary Onyarin, BSN, RN, DNP student

The final DNP scholarly project presented to the

Faculty of the University of Nebraska Medical Center College of Nursing

In Partial Fulfillment of the Requirements for the Degree

DOCTOR OF NURSING PRACTICE

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Abstract

Introduction: Delirium is associated with longer hospital stays, increased mortality, high medical costs, and poorer functional outcomes (Oh et al., 2014; Robinson & Eiseman, 2008).

This project evaluated the use of the Confusion Assessment Method (CAM) tool to screen hospitalized older adult hip fracture patients for delirium. This project also measured the effectiveness of the implementation of the Hospital Elder Life Program (HELP) volunteers as a non-pharmacological intervention to alleviate delirium. This project was implemented on the Orthopedic/Neurological unit of a Midwest tertiary care hospital.

Methods: The study had a retrospective, descriptive design. The investigators evaluated the use of the CAM tool to identify delirium in hospitalized older adult hip fracture patients over a 6-week timeframe from mid-March 2019 through May 2019. Data was obtained on 23 participants with use of the electronic CAM tool, the Electronic Medical Record data collection methods and HELP volunteer Data collection form. Twenty-two participants met inclusion criteria.

Findings: The investigators found the CAM tool was not always utilized every 12 hours as specified in the protocol. Furthermore, the HELP volunteer intervention was not utilized in the study. Therefore, the investigators were unable to determine the impact of the HELP volunteers on patient CAM scores.

Conclusion: The CAM tool was not utilized consistently by the nurses. Further study is needed to investigate the reasons for the deviation from protocol and the impact of the non-pharmacological intervention on the CAM scores of the patients.

Problem Statement and significance

Delirium is a significant problem for the hospitalized older adult populations that warrants further study of screening processes and targeted interventions. Older adults with hip fractures experience the highest rates of delirium in the acute care setting, with an incidence rate of 13% to 70% within this population (Mosk et al., 2017). Delirium is associated with longer hospital stays, increased mortality, high medical costs, and poorer functional outcomes (Oh et al., 2014; Robinson & Eiseman, 2008). Hip fractures are a common medical condition with approximately 300,000 patients in the United States experiencing a hip fracture each year. The annual world-wide incidence is expected to reach six million by the year 2050 (Oh et al., 2014). Delirium creates significant healthcare costs, but exact costs are difficult to calculate due to under reporting and misdiagnosis of this complicated medical issue. Delirium affects an estimated 20% of 11.8 million patients 65 years or older who are hospitalized each year with total direct 1-year health care costs attributed to delirium ranging from \$143 to \$152 billion annually (Leslie & Inouye, 2011). Falls, often associated with delirium, can be an additional expense to hospitals, costing up to \$17,500 per patient fall-related event (Babine et al., 2013). Fall rates in hospitalized patients with delirium are twice as high as those without delirium (Babine, Farrington, & Wierman, 2013).

Delirium often goes undiagnosed (Robinson and Eiseman 2008). Early recognition is critical to improving patient outcomes. However, managing delirium in hospital settings can be difficult due to its fluctuating nature and its similarities with dementia. In addition, knowledge of the importance of delirium management and of the negative effects it can have on patient outcomes if it is not managed properly is lacking (Solberg et al., 2013).

Appropriately screening patients for delirium is the first step in managing delirium and providing effective interventions to limit symptoms and course. The CAM tool has been studied and compared to other delirium screening tools. A systematic review of various delirium screening tools was conducted to identify, compare, and evaluate validation studies of delirium screening tools used on hospitalized patients. A total of 22 delirium screening tools were included, with the most prevalent being the Confusion Assessment Method (CAM) tool. They concluded that the CAM tool performed better in certain patient care environments, including the Emergency Department and postoperative medical-surgical patient populations. For this reason, the CAM tool was used in a previous study to screen the hospitalized older adult hip fracture patients for delirium.

In that study, once a patient screened positive for delirium, appropriate non-pharmacological interventions were to be implemented to alleviate the symptoms of delirium. This study was built on the previous one and added an exploration of the Hospital Elder Life Program (HELP). The HELP volunteers are used as a non-pharmacological intervention for delirium.

Purpose, aims, and clinical question.

This Quality Improvement project retrospectively investigated whether registered nurses on the Orthopedic/Neurological unit appropriately utilized the CAM tool to identify delirium in hospitalized older adult hip fracture patients. The patients were screened over a 6-week timeframe from mid-March 2019 through May 2019. This project also aimed to examine the effectiveness of the non-pharmacological intervention of the Hospital Elder Life Program (HELP) volunteers in addressing delirium. The goal of the investigators was to determine if use

of the HELP volunteers led to improved Confusion Assessment Method (CAM) scores per shift in those patients screening positive with delirium.

The Aims of the study were:

- 1) To determine if the bedside registered nurses utilized the CAM tool to assess patients within 8 hours of admission to the floor and once a shift until patient is discharged.
- 2) To determine the pattern of HELP, volunteer response for those patients screening positive for delirium on the CAM tool assessment and the activities used by the HELP volunteer with patients (music, hand massage, social/conversation, etc.).

Methods

Design

A retrospective, descriptive study design was used. investigators evaluated the implementation of the CAM tool for delirium screening (see Appendix A for the full tool) and the use of a non-pharmacological interventions for patients with delirium conducted by HELP volunteers under the recommendation of RNs.

Details of the Intervention

The HELP volunteers were to provide comfort, interaction, and activities such as games, television, ambulation, and hand massages for patients with the goal of alleviating symptoms of delirium. They were also to record the activities conducted with the patients along with the Financial Institution Number (FIN), a unique number assigned to the patient, patient room number, and date of visit. All information was compiled by the HELP volunteer coordinator and made available to the investigators.

HELP volunteers were present at the facility seven days a week, and on average there were two to four volunteers each day, with approximately 20 volunteers coming in each week. The volunteers started their shifts at 10 am. They typically volunteered for two to three hours, with the last shift ending around 8 pm.

Setting

The setting for the study was a tertiary-care hospital in the Midwest. The Orthopedic/Neurology nursing unit at the study site had adopted the nurse-led intervention for delirium in January 2019. This nursing unit has 30-beds, with single occupant rooms. On average, this nursing unit serves approximately 20 hip fracture patients a month, both non-surgical and surgical. Twenty-two hip fracture patients who met criteria were observed over the three-month study period. A total of 55 active registered nurses (RN) worked on the unit.

Subjects

Inclusion criteria for Aim 1 included older adults (≥ 65 years old), admitted to ortho/neuro study unit with a hip fracture. An initial inclusion criterion was that the subjects be English speaking because of the Aim 2 intervention. The project team expected subject's language proficiency could be determined by the need to utilize translation technology for non-English speakers. For Aim 2, inclusion criteria included the same criteria as Aim 1, with the addition of positive delirium confirmed by CAM tool screening on at least one occasion during length of stay. Because none of the subjects were seen by a HELP volunteer, subjects did not need to be proficient in English.

Exclusion criteria for Aims 1-2 included a) patients transferred to another nursing unit at any time prior to hospital discharge. Patients were not excluded for Aim 1 if they screened negative for delirium throughout their hospital stay or if HELP volunteers were not utilized.

Patients would have been excluded for Aim 2 if they had screened negative throughout their hospital stay.

Tools and Measures

Confusion Assessment Tool

The CAM tool was used in this study to detect potential delirium of the hospitalized patient. The CAM tool is a standardized evidence-based tool that enables non-psychiatrically trained clinicians to identify delirium quickly and accurately in both clinical and research settings (McCabe, 2019). The CAM includes four features used to assess for delirium. The four features are: acute onset, inattention, disorganized thinking, and altered level of consciousness (Inouye et al., 1990).

Feature one for the CAM diagnostic algorithm determines if an acute onset or fluctuating course exists and whether delirium is present. A positive score is also given if a patient exhibits a change in mental status from baseline. Feature two determines the presence of inattention and is divided into 2a and 2b. 2a assesses if the patient has difficulty focusing attention and 2b evaluates if this behavior fluctuates in severity during the assessment. 2a is positive if the patient has difficulty focusing attention and 2b is positive if the severity of inattention fluctuated during the assessment. Feature three is disorganized thinking and is positive if the patient is disorganized or incoherent, such as rambling, when conversing. Feature four is altered level of consciousness and any answer other than “alert” is considered abnormal, or positive (Inouye et al., 1990). The diagnosis of delirium by CAM requires the presence of features one and two, and either three or four (Inouye et al., 1990).

This tool has been translated into 10 languages. The tool has been adapted for use in ICU, emergency, and institutional settings (Wei et al., 2008). The CAM tool has been reported to have

sensitivities of 94-100% and specificities of 90-95% when used by staff specifically trained in its use (Wei, Fearing, Sternberg, & Inouye, 2008). The CAM tool is based on the criteria of the Diagnostic and Statistical Manual of Mental Disorders (Gélinas et al., 2018). This tool has been used in various settings to identify delirium in patients. When nurses are educated to use the tool, the accuracy of delirium identification increases (Diliberto et al., 2018).

Data Collection

Retrospective data were collected via an electronic chart review. Patient identification information was used to match patients to HELP volunteer data. Data were de-identified prior to analysis. The investigators collected the data manually and transcribed them into the data collection tool to allow for analysis.

Data from hip fracture patients with whom the CAM tool was used were collected from the patient records. For Aim 1, data collected included patient age, admission data/time, length of stay, CAM tool scores, and whether the CAM tool was used within 8 hours of admission and on each shift until discharge.

Aim 2 data collected included the date the HELP volunteer visited with the patient, and what activities the HELP volunteer conducted with the patient. The data collection tool, supplied by the volunteer coordinator, did not provide a time stamp. Patients who screened positive for delirium were to receive a visit from the HELP volunteer within one day of a positive CAM score. The data were collected for each shift throughout the patient's stay.

HELP volunteer data were provided to the investigators by the HELP volunteer coordinator by use of an existing spreadsheet previously developed by the coordinator. Data that were collected included the patient FIN, room number, date of visit, and activities done with the patient.

Timeline

This study included elderly patients admitted and discharged from the unit during a 6-week period between mid-March 2019 and May 2019. This represents the timeframe that the CAM tool was implemented and utilized on the unit.

Delirium Education for Staff

Nursing staff on the Ortho/Neuro unit received education on delirium upon hire, along with yearly education during unit specific competencies. Education included information on delirium, the importance of prompt identification of delirium, and how to use the CAM tool to screen for delirium. The education also briefly explained when to contact the HELP volunteers for patients who showed signs of delirium.

Analysis

For Aim 1, the variables included length of stay, CAM tool completed within 8 hours of admission, CAM score count, expected CAM score count, and CAM completion rate. The length of stay was measured by calculating the total number of 12-hour shifts (both 0700-1900 and 1900-0700) for which the patient was present. The length of stay included the first shift on which the patient was present through the shift on which the patient was discharged. The investigators subtracted the time of first CAM tool use from the time of admission to determine if the evaluation was completed within 8 hours of patient admission to the unit. If the initial CAM tool screening was performed outside the 8-hour window, it was counted as not completed.

The CAM tool assessment was expected to be performed on each shift. Each CAM tool assessment was counted as 1, and if multiple assessments were performed during a shift, it was still counted as 1.

The Expected CAM Assessment Count was calculated by counting the number of 12-hour shifts on which the patient was on the unit (0700-1900 or 1900-0700), regardless of the amount of time during the shift the patient was present. The Observed Count was the total number of times the patient was screened during the hospitalization, minus any assessments duplicated on a given shift. The CAM Completion Rate was determined by dividing the Observed Count by the Expected CAM Assessment Count and multiplying by 100. (See Appendix B)

For Aim 2, the investigators looked at patients who screened positive for delirium at least once during their hospital stay. A positive screening indicated a HELP volunteer was needed beginning within one day of that shift.

Results

The investigators obtained data on 23 patients. Twenty-two participants met study inclusion criteria. One participant was excluded because they transferred to the ICU during the study. The sample included patients aged 65 and older who were admitted to the ortho/neuro unit with a hip fracture. Of the 22 participants, 4 were male (18.2%) and 18 were female (81.8%).

Aim 1

The CAM tool was completed within eight hours of admission on 10 of the 22 (45.5%) included patients. The rate of tool completion within eight hours was lower than expected, so an additional analysis was completed to determine if length of patient stay was related to use of the CAM tool. The incidence of a specific Length of Stay was too small for analysis, so Length of Stays were clustered at 5-9, 10-14, and 15-29. See Table 1 for data.

Table 1. CAM Scores by Length of Stay

Length of Stay (shifts)	Number of Participants	Completed within 8 Hours of Admission	Average Number of CAM Scores for Hospitalization	CAM Score Range of Number of CAM Scores
5 - 9	12	6	4	2 - 6
10 - 14	8	4	6	4 - 8
15 - 29	2	0	7	6 - 8

Seven patients presented with the presence of delirium on at least one day during their stay.

For these seven patients, their total days of delirium ranged from one to three. See Table 2

below:

Table 2: Incidence of Delirium

Days of Delirium	Number of patients
1	4
2	2
3	1

These seven patients should have received the HELP Volunteer intervention. However, documentation within the HELP Volunteer Logs did not document a visit to any of these patients. Because no patients received visits from the HELP volunteers, the author could not analyze responses to the visits.

Discussion

This quality improvement project evaluated the use of the CAM tool to screen hospitalized older adult hip fracture patients for delirium. The project also explored the use of HELP volunteers to alleviate delirium. The project was implemented on the Orthopedic/Neurological unit of a hospital during a 6-week timeframe from mid-March 2019 through May 2019. The findings from this retrospective, descriptive study, based on 22 participants that met inclusion criteria, provided insight into the pattern of use of the CAM tool to assess patients for delirium.

The investigators expected the CAM tool would be used to evaluate the patients for delirium within the first 8 hours of admission and at least once every shift. Results showed that only 45.5% of the patients were evaluated within the first 8 hours of admission. Patients continued to be evaluated irregularly throughout their hospital stay. No patient included was evaluated with the CAM tool on every shift. The evaluations appeared to be spread randomly across shifts.

There are several possible reasons the nurses did not follow protocol. The nurses may not have known that they were to screen the patients every shift. The nurses may not have remembered to complete the assessment. There may not have been sufficient time during the shifts for the nurses to complete the assessment tool or implement the intervention. Lastly, the nurses may have completed the assessment but failed to document the CAM score in the chart.

Delirium was present in seven of the patients during at least one point in their hospital stay. Those seven patients needed the HELP volunteer intervention. However, HELP Volunteer visits were not recorded for these patients. Because of the lack of interventions, the effectiveness of interventions could not be evaluated.

The author proposes several reasons the HELP volunteers were not used. First, the nurses may not have known they were to refer the patients to the HELP volunteers. Second, nurses may not have known how to refer the patients to the HELP volunteers. Finally, the nurses may not have had sufficient time during the shift for them to refer the patients to the HELP volunteers.

Limitations

This study is affected by several limitations. First, the sample size was insufficient for statistical analysis. A larger sample size would have increased the ability to conduct one or more statistical analyses.

Second, missing HELP volunteer data prevented the evaluation of the impact of the HELP volunteers on CAM scores. Therefore, further investigation is needed to evaluate the relationship between the CAM scores of the patients and the utilization of the HELP volunteers.

Recommendations

This author recommends several next steps in using the CAM score to assess post hip fracture delirium. The experience and comfort levels of the nurses with utilizing the CAM tool and HELP Volunteers could be investigated using surveys and focus groups. Survey questions could include: 1) Did the nurses feel like the CAM tool was used often enough 2) What were the barriers to using the CAM tool 3) How could nurses be made more aware of the availability of the HELP volunteers 4) Do nurses feel comfortable contacting the HELP volunteers, why or why not 5) Do nurses prioritize the use and documentation of the HELP Volunteers, why or why not and 6) Does the nursing workload permit nurses to contact the HELP volunteers? Gaining

feedback from the nurses may help identify areas of improvement and provide opportunities for those issues to be addressed.

Additional measures for reminding nurses to conduct the CAM assessment on the patients and to contact the HELP Volunteers are needed. Creating reminders in the Electronic Medical Record could aid nurses in remembering to use the CAM tool within eight hours of the patient's admission and every shift thereafter. Reminders to all staff during start of shift huddle may also be helpful.

Continuous education is key to the successful implementation of the CAM tool and HELP Volunteer intervention. Education can reinforce the importance of promptly identifying patients with delirium and providing interventions to ease their symptoms. Examples of educational resources include binders on the floors, or a web page with frequently asked questions regarding the use of the CAM tool and the HELP volunteers.

A last comment is HELP volunteers were potentially available within the hospital between 8 am and 10 pm daily. HELP volunteers should be scheduled so the nurses will know when the volunteers will be available on the unit. The volunteers should also make rounds and ask the nurses about who needs to be visited. These suggestions will facilitate the utilization of the HELP volunteers.

Conclusions

In conclusion, the purpose of this quality improvement project was to assess the utilization of the CAM tool and to measure the effectiveness of the HELP volunteers' activities with improving patient CAM scores. The investigator found the nurses were able to use the CAM tool to identify delirium. However, the CAM tool was not always used upon admission or on every shift. Further study is needed to investigate the reasons for deviations from protocol. In

addition, the HELP volunteers were not utilized during this study. Once the use of the CAM tool for measurement of delirium becomes a standard practice, the measurement of the impact of the non-pharmacological intervention on the CAM scores of the patients will be needed.

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Appendix A

Electronic Confusion Assessment Method (CAM) Tool

Confusion Assessment Method Instrument	
Confusion Assessment Method Instrument	
Check either YES or NO at the right which best describes the patient's behavior	
1. (Acute Onset) Is there evidence of an acute change in mental status from the patient's baseline?	<input type="radio"/> Yes <input type="radio"/> No
2.A. (Inattention) Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?	<input type="radio"/> Yes <input type="radio"/> No
2.B. (Inattention; If present or abnormal) Did this behavior fluctuate during the interview, that is, tend to come and go or increase and decrease in severity.	<input type="radio"/> Yes <input type="radio"/> No
3. (Disorganized Thinking) Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?	<input type="radio"/> Yes <input type="radio"/> No
4. (Altered Level of Consciousness) Overall, how would you rate this patient's level of consciousness? Alert (Normal); Vigilant (Hyperalert, overly sensitive to environment stimuli, startled very easily); Lethargic (drowsy, easily aroused); Stupor (difficult to arouse); Coma (unarousable) Uncertain	<input type="radio"/> Alert <input type="radio"/> Stupor <input type="radio"/> Vigilant <input type="radio"/> Comatose <input type="radio"/> Lethargic <input type="radio"/> Uncertain
* (Disorientation) Was the patient disoriented at any time during the interview, such as thinking that he or she as somewhere other than the hospital, using the wrong bed, or misjudging the time of day?	<input type="radio"/> Yes <input type="radio"/> No
* (Memory Impairment) Did the patient demonstrate any memory problems during the interview such as inability to remember events in the hospital or difficulty remembering instructions?	<input type="radio"/> Yes <input type="radio"/> No
* (Perceptual Disturbances) Did the patient have any evidence of perceptual disturbances, for example Hallucinations, illusions or misinterpretations (such as thinking something was moving when it was not)?	<input type="radio"/> Yes <input type="radio"/> No
* A (Psychomotor Agitation) At any time during the interview did the patient have an unusually increased level of motor activity such as restlessness, picking at bedclothes, tapping fingers or making frequent sudden changes of position?	<input type="radio"/> Yes <input type="radio"/> No
* B (Psychomotor Retardation) At any time during the interview did the patient have an unusually decreased level of motor activity such as sluggishness, staring into space, staying in one position for a long time or moving very slowly?	<input type="radio"/> Yes <input type="radio"/> No
* (Altered Sleep-Wake Cycle) Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia?	<input type="radio"/> Yes <input type="radio"/> No
Reference: Inouye SK, vanDyck CH, Alessi CA, Balkin S, Siegel AP, Horwitz RI. Clarifying confusion: The Confusion Assessment Method. A new method for detection of delirium. Ann Intern Med. 1990; 113: 941-948. Confusion Assessment Method: Training Manual and Coding Guide, Copyright 2003, Sharon K. Inouye, M.D., MPH. Not to be reproduced without permission. Instructions for correct usage available at: < http://elderlife.med.yale.edu/pdf/The_Confusion_Assessment_Method.pdf >, or on request from Dr. Sharon Inouye.	<div style="background-color: #00FF00; color: white; text-align: center; padding: 2px; font-weight: bold;">CAM Instrument</div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <input type="radio"/> 4=Delirium <input type="radio"/> 5=No Delirium </div> <p style="font-size: small; margin-top: 10px;">The Diagnosis of delirium by CAM (Confusion Assessment Method) REQUIRES the presence of features 1 and 2 and EITHER 3 or 4.</p>

Data from the above tool is collected from the EMR of patients who have had the CAM Tool documented on them during their hospital stay. Nurses use the CAM tool to document at least once a shift, including at time of any acute changes.

Appendix B

Table of Variables

	Length of Stay (shifts)	CAM Tool Completed within 8 Hours of Admission (Yes/No)	Observed Count	Expected CAM Assessment Count	CAM Completion Rate (%)
Participant 1	13	No	5	13	38.5
Participant 2	11	Yes	8	11	72.7
Participant 3	7	Yes	3	7	42.9
Participant 4	6	No	2	6	33.3
Participant 5	14	No	6	14	42.9
Participant 6	10	No	6	10	60.0
Participant 7	8	No	5	8	62.5
Participant 8	7	No	3	7	42.9
Participant 9	10	Yes	7	10	70.0
Participant 10	8	No	6	8	75.0
Participant 11	9	Yes	4	9	44.4
Participant 12	8	Yes	6	8	75.0
Participant 13	15	No	6	15	40.0
Participant 14	12	Yes	4	12	33.3
Participant 15	9	No	3	9	33.3
Participant 16	7	No	5	7	71.4
Participant 17	14	Yes	5	14	35.7
Participant 18	9	Yes	5	9	55.6
Participant 19	29	No	8	29	27.6
Participant 20	12	No	8	12	66.7
Participant 21	5	Yes	3	5	60.0
Participant 22	7	Yes	4	7	57.1