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Decreasing Continuous 1:1 Observation of Patients Experiencing Delirium by Improving Nursing Knowledge

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BACKGROUND: Nursing leadership identified that Certified Nursing Assistants (CNAs) and Registered Nurses (RNs) on the Acute Care for Elders (ACE) unit lacked delirium knowledge. Patients were being placed on continuous 1:1 observation without proper delirium assessment which the CNO identified as an opportunity to improve resource utilization.

METHODS: A quality improvement project was conducted on the ACE unit at Penn Presbyterian Medical Center (PPMC). The CNAs and RNs completed a delirium knowledge survey prior to and after viewing an evidence-based dynamic education module based on the Hospital Elder Life Program (HELP) protocols. Pre- and post-survey mean scores were compared. Continuous 1:1 observation utilization was analyzed two months prior to and two months post-implementation to determine if the education impacted continuous 1:1 observation utilization.

RESULTS: 17 CNAs and 34 RNs completed the pre-survey. Mean pre-survey scores were: 11.76 (sd 1.92, range 7-15) for the CNAs and 13.5 (sd 2.11, range 9-17) for the RNs. Ten CNAs and 20 RNs completed the post-survey. The post-survey mean scores were: 13.5 (sd 2.68, range 9-16) for the CNAs and 14.7 (sd 1.76, range 11-18) for the RNs. Bi-weekly continuous 1:1 utilization decreased from 5.0 to 3.4 after implementation of the evidence-based dynamic education module.

CONCLUSION: Evidence based education on delirium prevention, identification, and interventions using the HELP protocols can improve CNA and RN knowledge and help reduce the financial strain on the health system by decreasing continuous 1:1 observation utilization.

Keywords

continuous 1:1 observation, delirium, nursing knowledge

Disciplines

Nursing

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Decreasing Continuous 1:1 Observation

Usage of Patients Experiencing Delirium by Improving Nursing Knowledge

Introduction

Delirium, an acute (hours to days) disturbance in cognition that results in inattention, disorganized thinking, and alteration of consciousness, is an often unrecognized but preventable source of morbidity and mortality among older hospitalized adults (Inouye, Westendorp, & Saczynski, 2013). Delirium is a highly prevalent condition affecting up to 56% of older adults hospitalized on medicine units (Caplan & Harper, 2007). Many factors increase the likelihood of delirium such as malnutrition, dehydration, use of a urinary catheter, visual and or hearing impairment, depression, history of alcohol abuse, and home opioid or benzodiazepine use (Vasilevskis, Han, Hughes, & Wesley, 2012).

Delirium negatively effects the patient's overall health and well-being (Fong, Tulebaev & Inouye, 2009). However, when delirium is recognized in early stages, the number and severity of detrimental effects may be reduced including length of stay (Fong, Tulebaev & Inouye, 2009) and continuous 1:1 observation (Caplan & Harper, 2007). Older adults with delirium have higher risk of mortality, falls, incontinence, and pressure injuries (Inouye, Westendorp, & Saczynski, 2013). In one study, patients with delirium had a 62% increase in mortality 1-year post discharge compared to those without delirium (Leslie & Inouye, 2011). Management of delirium is multifactorial. Continuous 1:1 observation of patients is one approach to manage delirium in older patients. One-to-one monitoring and the presence of a 1:1 observer, typically a certified nursing assistant or patient care observer, helps ensure the provision of adequate patient care (Carr, 2013). However, this strains the health system due to increased utilization costs of frequent continuous 1:1 observation for older adults with delirium. The United States spends

over 143 billion dollars caring for patients with delirium (Leslie & Inouye, 2011; Schubert et. al, 2018). Prevention and early detection help to minimize the costs and negative outcomes of delirium. In fact, delirium is preventable in 30-40% of cases (Fong, Tulebaev, and Inouye, 2009; Ghaeli et. al, 2018; Sandhaus, Harrell, & Valenti, 2006).

Nursing leadership at Penn Presbyterian Medical Center identified that the certified nursing assistants (CNAs) and registered nurses (RNs) on the Acute Care for the Elders (ACE) unit lacked the knowledge to recognize patients at risk for delirium, the signs and symptoms of delirium, and the latest evidence-based management of delirium. Therefore, nursing leadership requested education on delirium prevention, recognition, and management for the CNAs and RNs (Personal Communication with Nursing Leadership at PPMC, December 2019). When delirium is recognized early, the number and severity of detrimental effects is reduced including poor patient outcomes, decreased continuous 1:1 observation (Caplan & Harper, 2007; Cerejeira & Mukaetova-Ladinska, 2011), and prolonged lengths of stay (Fong, Tulebaev, & Inouye, 2009; Ghaeli et. al, 2018; Sandhaus, Harrell, & Valenti, 2006). Early recognition of and interventions for delirium improve patient outcomes and help reduce the financial strain on the health system by decreasing continuous 1:1 utilization costs. The Chief Nursing Officer identified continuous 1:1 observations throughout PPMC as an opportunity to decrease health system costs and was therefore supportive of interventions to decrease continuous 1:1 observation utilization (Personal Communication with CNO, September 2019). Prior to the implementation of this quality improvement project, in FY20, (July 2019-June 2020) Penn Presbyterian Medical Center utilized 41 full time equivalents (FTEs), $1,792,123, on continuous 1:1 observation resources. On the ACE unit, 4.1 full time equivalents (FTEs), 8,633 hours, were utilized to cover continuous 1:1

observations with certified nursing assistants and patient care observers totaling $180,037 during FY20.

Currently, the ACE unit CNAs and RNs have not received the latest evidence-based education on the prevention, assessment of, and interventions for delirium nor is an evidence-based delirium assessment tool used on the ACE unit (PPMC Nursing Leadership, personal communication, December 2019). Educating the ACE unit CNAs and RNs on the evidence-based interprofessional protocol, the Hospital Elder Life Program (HELP) and the delirium screening tool, the Confusion Assessment Method (CAM) will potentially improve overall quality of care provided to persons with delirium on the ACE unit (Hospital Elder Life Program, 2020). The CAM is a necessary component of HELP to assess for delirium. This tool assesses the presence of acute onset confusion, inattention, disorganized thinking, and an alteration in consciousness (Inoyue, VanDyck, Alessi, Balkin, Siegal, Horwitz,1990; Strigbos et al., 2013). HELP is designed to prevent negative patient outcomes, alert clinical staff to factors that may indicate the presence of delirium, and provide multicomponent protocols targeted at risk factors for delirium including; cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration (Rubin et al., 2006). This program of interventions targeting risk factors of delirium was successful in preventing delirium in 40% of hospitalized older adults (Ghaeli et. al, 2018; Sandhaus, Harrell, & Valenti, 2006). With the proper identificiation, prevention, and interventions the negative effects of delirium in acute care settings can be minimized (Yevchak et al., 2012).

To address the delirium educational needs for the CNAs and RNs and shift the culture on the ACE unit to a nurse-led process, an evidence-based dynamic delirium education module was implemented addressing prevention, recognition, and interventions for patients with delirium

which included the HELP protocols and the CAM screening tool. Interactive, dynamic delirium education can have positive effects on clinical outcomes (Rockwood, 1999). After the deployment of the delirium education module, huddle sheets were provided to reinforce the information from the educational intervention. The HELP protocols in the education intervention included interventions to address: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehyrdration (Rubin et al., 2006). Implementing these evidence-based strategies will potentially save the health system resources by decreasing the number and length of continuous 1:1 observations and improve the quality of care for the older adults with delirium on the ACE unit. Given the prevalence of delirium in older adults, with the appropriate evidence-based education, the CNAs and RNs have the potential to mitigate the negative impact of delirium on older adults, by assessing, preventing, and managing delirium using the HELP protocols and the CAM screening tool, potentially decreasing the need for continuous 1:1 observers.

The purpose of this evidence-based dynamic education intervention and quality improvement project was to decrease continuous 1:1 observation of older adults with delirium by increasing the ACE unit CNAs and RNs knowledge on how to assess, prevent, and intervene early to manage delirium in older adults on the ACE unit at Penn Presbyterian Medical Center.

The specific aims of this QI project were to:

1. Assess the effect of an evidence-based education intervention on the ACE unit CNAs and RNs knowledge of the assessment, prevention, and interventions for delirium.
2. Assess the effect of an evidence-based education intervention on the continuous 1:1 observation utilization on the ACE unit two months post the evidence-based dynamic

education intervention compared to the two month baseline continuous 1:1 observation utilization.

Methods

Context

The Acute Care for the Elders unit is a 36-bed unit in a 350 bed, Level 1 Trauma Center and provides specialized, comprehensive interdisciplinary care for older adults (PPMC, ND). Typically, patients admitted to the ACE unit are 70 years old or older with varying medical conditions. The team consists of geriatric medicine physicians, RNs, CNAs, physical therapists, and social workers who provide interdisciplinary geriatric care and create a comfortable environment dedicated to the unique needs of older adult patients and their families (PPMC, ND). At the initiation of this quality improvement project the ACE unit had 17 CNAs and 34 RNs, a Nurse Manager, and a Clinical Nurse Educator (PPMC Nursing Leadership, 2020). Nursing leadership at Penn Presbyterian Medical Center identified that the CNAs and RNs working on the ACE unit lacked the latest knowledge for recognizing signs and symptoms of delirium. In fact, nursing leadership requested education for the staff on the ACE unit on delirium prevention, recognition, and management (Personal Communication with Nursing Director, Nurse Manager, Clinical Nurse Educator, 2019). Furthermore, the Chief Nursing Officer identified continuous 1:1 observations as an opportunity to decrease health system costs (Personal Communication with the CNO, September 2019) and therefore was supportive of this quality improvement project to decrease continuous 1:1 observation utilization on the ACE unit.

Measures

A REDCap database, a secure web application for building and managing online surveys, databases, and delivering educational material was used to build a confidential survey which included the assessment of the following measures:

Demographics / participant characteristics. The 11 demographic questions assessed CNAs and RNs gender, age, ethnicity, race, current role, highest level of education completed, how long they have been in their current role, how long they have been employed by the current institution, how many years they have practiced on the ACE unit, which shift they work, and their current employment status.

Delirium nursing knowledge survey. This instrument was created to assess the CNAs and RNs knowledge prior to the implementation of an dynamic delirium education module. The survey included 18 true/false and multiple choice questions about delirium symptoms, precipitating causes of delirium in older adults, the difference between dementia and delirium, delirium risk factors, the sub-types of delirium, delirium prevention, delirium interventions, the incidence of delirium, morbidity and mortality associated with delirium. Two questions assessed the staffs familiarity and knowledge of the Hospital Elder Life Program (HELP) (Hospital Elder Life Program, 2020; Inouye, Westendorp, & Saczynski, 2013) and the Confusion Assessment Method (CAM) (Inouye et al., 1990). A total score for the pre-and post-surveys was computed based on the number of survey questions the CNAs and RNs answered correctly (ranging from 0 to 18). Higher scores on the pre- and post-surveys indicated higher knowledge of delirium assessment, prevention, and interventions.

1:1 Observation. The frequency of continuous 1:1 observation patients was based on whether patients who exhibited impulsiveness, agitation, or delirium required constant

monitoring by a certified nursing assistant or patient care observer to ensure safety on the ACE unit. The average number of patients placed on continuous 1:1 observation for the specific reasons above were analyzed bi-weekly two months prior to and after the dynamic delirium education module to see whether continuous 1:1 observation usage had decreased after the education intervention was implemented on the ACE unit.

Intervention

A dynamic evidence-based dynamic delirium education module was developed to deploy to the CNAs and RNs on the ACE unit as the intervention. The project team consisted of the ACE unit nursing leadership; the nursing director, the nurse manager, the clinical nurse educator as well as the CNAs and RNs on the ACE unit. This quality improvement project required several steps. Following the request from ACE unit nursing leadership for evidence-based eduction on delirium, huddles were attended to inform the staff of the the quality improvement project and garner their support. Baseline data for the two months of the ACE units continuous 1:1 observation utilization data was gathered prior to the deployment of the baseline survey and dynamic evidence-based educational module. The intervention, a dynamic delirium education module using REDCap to educate the CNAs and RNs on the prevention, identification, and nonpharmacological management of delirium was created and launched on the unit. This included defintions of delirium, delirium symptoms, delirium risk factors, delirium subtypes, the difference between delirium and dementia, delirium prevention, delirium interventions, and delirium case studies. The core components of the HELP intervention were also included in the dynamic delirium education (HELP, 2020; Inouye, Westendorp, & Saczynski, 2013) including the Confusion Assessment Method (CAM) tool, an evidence-based screening tool for delirium used by nurses and the interdisciplinary team (Inouye et al., 1990). To create a dynamic

evidence-based educational module that would keep the certified nursing assistants and registered nurses engaged, readily available evidence-based content was combined (County Durham & Darlington NHS Foundation Trust, 2016; Dementia Together NI, 2016; Gateway Geriatric Education Center, 2015; Medskl.com, 2016; Osmosis, 2020) and a PowerPoint presentation including the HELP protocols and CAM was created. The educational module was 34 minutes long. Neither the HELP models or the CAM screening tool were implemented on the unit however, the information was disseminated to the staff to support their education.

A pre-survey was sent to all the CNAs and RNs on the unit. The survey was designed to require each question to have an answer to avoid missing data. All responses were accepted as accurate as they were from both a self-reported demographic survey and pre-and post-surveys assessing delirium knowledge. The intervention procedures included each of the CNAs and RNs completing the dynamic delirium education module, followed by each of the CNAs and RNs completing a post-survey. The post-survey included the same questions as the pre-survey in order to compare the staffs scores prior to and after they viewed the evidence-based dynamic delirium education. The post-survey was deployed once all the CNAs and RNs completed the dynamic delirium education module. Huddle sheets reinforcing the delirium prevention strategies and protocols were also created to improve the uptake of the new knowledge gained by the evidence-based dynamic delirium education. The huddle sheets were reviewed and provided at staff meetings, change of shift huddles, and via email.

Study of Interventions

Prior to launching the dynamic evidence-based delirium education module a pre-survey was distributed to the ACE unit CNAs and RNs to determine their baseline knowledge and understanding of how to assess, prevent, and intervene in patients with delirium. The survey also

assessed whether the staff was familiar with delirium prevention strategies and interventions which included the Hospital Elder Life Program and Confusion Assessment Method. This survey was launched March 1, 2020. On April 1, 2020, due to the COVID-19 pandemic, this project had to be put on hold. During this period of time, the University of Pennsylvania put a hold on research conducted at the University due to the stress and impact of COVID-19. On May 22, 2020, the project was able to resume. The pre-survey was completed May 31st and the dynamic delirium education module was launched on June 8, 2020. The nursing assistants and nurses were given two months to view the educational module. The post-survey was sent out August 1, 2020 for the staff to complete. Throughout this process, positive feedback was received from both the nursing assistants and the nurses on the unit. A pre-survey and post-survey were made based on key components of assessing, preventing, and intervening in patients with delirium. Questions for the survey were developed based on the Geriatric Resource Nurse Model and Nurses Improving Care of Healthsystem Elders (NICHE) (NICHE, 2020) and structured based on recognition, assessment, prevention, and interventions for patients with delirium. A pre-post design was used to determine the CNAs and RNs delirium knowledge before and after a dynamic evidence-based delirium education module was viewed.

Continuous 1:1 observations are frequently implemented on the ACE unit especially for patients with delirium. As the manager of the staffing office and, overseeing the staff distributed to continuous 1:1 observations at Penn Presbyterian Medical Center, the choice was to focus on the unit with the most continuous 1:1 observations for delirium. The ACE unit was also chosen due to the patient population being primarily 70 years old and older. When assessing 1:1 utilization, it was determined whether patients were female or male and whether patients had signs of delirium, confusion, agitation, or impulsiveness. Then, the frequency of 1:1 usage and

the length of continuous 1:1 observation was analyzed. The ACE unit 1:1 utilization was measured from April 1, 2020 until June 6, 2020 prior to the launch of the dynamic evidence-based delirium education module on June 8, 2020 and again from August 3, 2020 until October 7, 2020 after the education module was viewed by the certified nursing assistants and registered nurses. The goal was to analyze whether the delirium education provided to the CNAs and RNs impacted 1:1 utilization on the unit two months post-implementation of the dynamic delirium education module.

Analysis

Descriptive statistics were used to describe the sample and summarize demographic variables. Means and medians were used to summarize continuous variables such as the number of continuous 1:1 observations and pre-and post-survey scores. Demographics measured at the categorical level were reported using frequencies and percentages. Separate bar charts were used to compare the pre-and post-survey scores for the CNAs and pre-and post-survey scores for the RNs. Run charts are an ideal methodology to assess change over time (Perla, Provost, Murray, 2011). Therefore, this analytical tool was used to assess the frequency of patients on continuous 1:1 observation bi-weekly for the two months prior (April 2020 – June 2020) to the education intervention and for two months after the intervention (August 2020 – October 2020). The bi-weekly periods were indicated on the x-axis. The y-axis indicated the frequency of 1:1's initiated in the two-week time period shown on the x-axis in Figure 2.

Ethical Considerations

The University of Pennsylvania IRB determined this project qualified as a quality improvement initiative in January 2020.

Results

The pre-survey included responses from 51 ACE unit employees; 17 nursing assistants and 34 registered nurses. Most respondents were from females (86.3%), of Non-Hispanic or Latino ethnicity (98%), and Black/African American (24, 47.1%). Twenty-eight employees had a Bachelor of Science in Nursing degree (54.9%). Of the 51 employees who responded the majority worked day shift (54.9%) followed by the night shift (41.2%). The majority of employees were full time (39, 76.5%). Nursing assistants who responded to the pre-survey were in their role on average for 13.8 years; employed at Penn on average for 5.3 years; and worked on the ACE unit on average for 5.2 years. Nurses who responded to the pre-survey were in their roles on average for 9.44 years; employed at Penn on average for 5.74 years; and worked on the ACE unit on average for 4.21 years. The pre-survey mean total score was 11.76 (sd 1.92, range 7-15) for the certified nursing assistants and 13.5 (sd 2.11, range 9-17) for the registered nurses.

Pre-Intervention

The demographics of the pre-and post-survey participants are presented in Table 1.

Table 1
Pre-Survey and Post-Survey Demographics

	Pre-Survey (*n*=51)		Post-Survey (*n*=32)	
	n	%	*n*	%
Gender				
Female	44	86.3	25	78.1
Male	6	11.8	4	12.5
Prefer not to answer	1	2	3	9.4
Ethnicity				
Hispanic or Latino	0	0	1	3.1
Not Hispanic or Latino	50	98	31	96.9
No Response	1	2		
Race				
American Indian, Alaskan Native	1	2		
Asian	6	11.8	6	19.4
Black/African American	24	47.1	14	45.2
Native Hawaiian/Other Pacific Islander	0	0		
White/Caucasian	16	31.4	10	32.3
Mixed Race	3	5.9	1	3.2
No Response	1	2.0.		
Current Role				
RN	34	66.7	22	68.8
NA	17	33.3	10	31.3
Highest Level of Education Completed				
Education Level Below Bachelor's Degree Non-Nursing	12	25.5	9	28.1
Bachelor's Degree Non-Nursing	4	7.8	4	12.5
Bachelor of Science in Nursing	28	54.9	14	43.8
Master of Science in Nursing	4	7.8	5	15.6
Other Master's Degree Non-Nursing	2	3.9	0	0
Shift Worked Majority of Time				
Days	28	54.9	16	50
Evenings	2	3.9		
Nights	21	41.2	16	50
Employment Status				
Full Time	39	76.5	26	81.3
Part Time	4	7.8	4	12.5
PRN	7	13.7	2	6.3
Contract/Traveler	1	2		

Intervention

The dynamic evidence-based delirium education module was developed incorporating principles from Nurses Improving Care of Healthsystem Elders (NICHE) (NICHE, 2020). These principles included evidence-based geriatric care at the bedside, patient/family centered care, healthy and productive practice environments, and multidimensional metrics of quality. Key elements of the evidence-based HELP model and the CAM were incorporated into the module. The project team consisted of the ACE unit nursing leadership, the nursing director, the nurse manager, the clinical nurse educator as well as the CNAs and RNs on the ACE unit. This quality improvement project required several steps. Following the request from ACE unit nursing

leadership for evidence-based education on delirium, huddles were attended to inform the staff of the quality improvement project and garner their support. Baseline data was gathered from the previous two months of the ACE units continuous 1:1 observation utilization data. The intervention, a dynamic delirium education module using several evidence-based freely available educational videos (County Durham & Darlington NHS Foundation Trust, 2016; Dementia Together NI, 2016; Gateway Geriatric Education Center, 2015; Medskl.com, 2016; Osmosis, 2020) and a PowerPoint presentation developed on the HELP modules and the CAM were uploaded in REDCap. This educational module was created and launched to educate the ACE unit CNAs and RNs on the prevention, identification, and nonpharmacological management of delirium. This dynamic evidence-based education module included definitions of delirium, delirium symptoms, delirium risk factors, delirium subtypes, the difference between delirium and dementia, delirium prevention, delirium interventions, and delirium case studies. The core components of the HELP intervention including the HELP protocols to address: daily visitor orientation, therapeutic activities, early mobilization, hearing, vision, oral volume repletion/feeding assistance, and sleep enhancement were included in the dynamic delirium education (HELP, 2020; Inouye, Westendorp, & Saczynski, 2013) as well as the Confusion Assessment Method (CAM) tool, an evidence-based screening tool for delirium used by nurses and the interdisciplinary team (Inouye et al., 1990). This evidence-based educational module was 34 minutes long and delivered through REDCap.

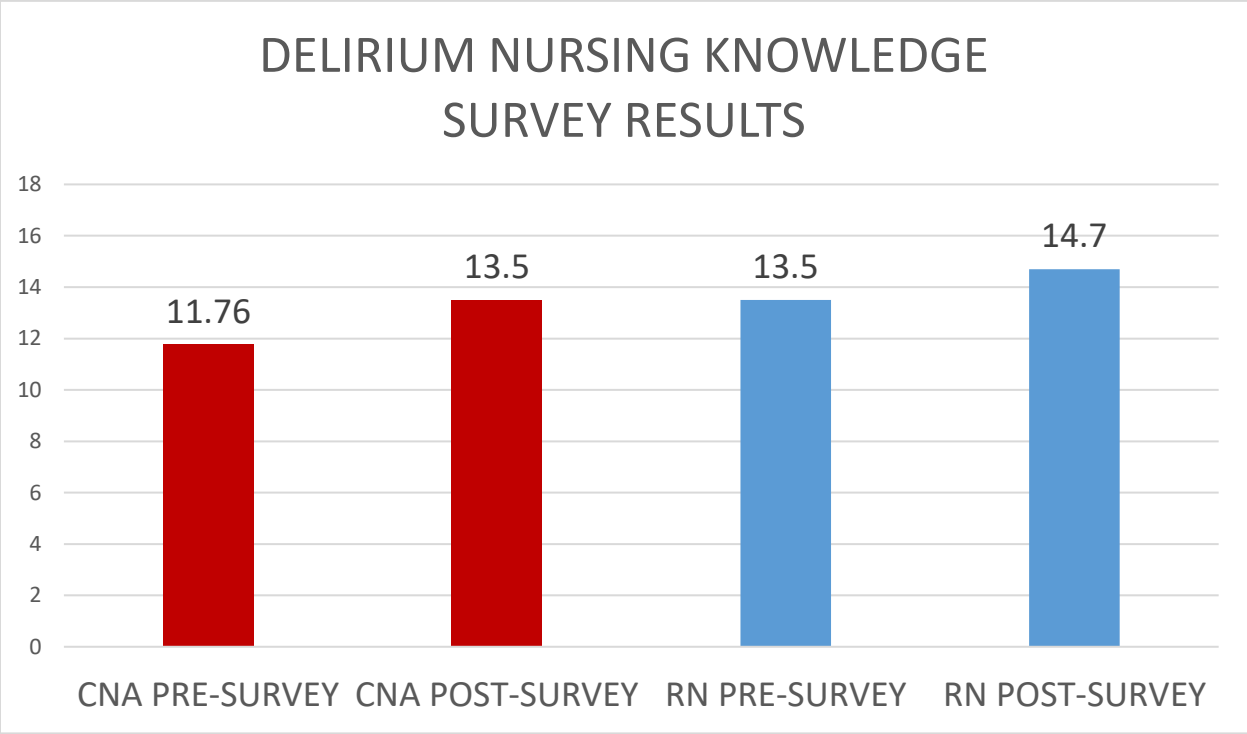
Post-Intervention

The post-survey included responses from 10 nursing assistants (2 incomplete surveys) and 20 nurses all of which were the same employees who participated in the pre-survey. The

demographics for the post-survey participants are provided in Table 1. Twenty-five of the responses were from females (78.1%). Thirty-one of the CNAs and RNs (96.9%) were of Non-Hispanic or Latino ethnicity. Fourteen were Black/African American (45.2%). Fourteen had a Bachelor of Science in Nursing degree (46.9%). Of the 32 employees who responded, 16 worked day shift and 16 worked night shift. Twenty-six employees were full time (81.3%). Nursing assistants who responded to the post-survey were in their role on average for 12.9 years, employed at Penn on average for 3.8 years, and worked on the ACE unit on average for 3.4 years. Nurses who responded to the post-survey were in their roles on average for 10 years; employed at Penn on average for 5.7 years and worked on the ACE unit on average for 4.9 years. The post-survey mean total score was 13.5 (sd 2.68, range 9-16) for the certified nursing assistants and 14.7 (sd 1.76, range 11-18) for the registered nurses. Overall, the response mean total scores improved by 1.74 for the CNAs and 1.2 for the RNs. See Figure 1. It was observed, from this unpaired data, there was less delirium knowledge in the pre-group of both the CNAs and the RNs and greater knowledge in the post-group.

Figure 1

Pre-Survey and Post-Survey Results from the Delirium Nursing Knowledge Survey



Continuous 1:1 Observation

During the two months prior to implementation of the dynamic evidence-based delirium education, 27 continuous 1:1 observations were initiated on the ACE unit. Eleven patients were female and 16 were male. One to one's were initiated for impulsiveness (13 times), agitation (3 times), confusion (10 times), and multiple reasons (1 time). For the two months post-implementation, 15 continuous 1:1 observations were initiated on the ACE unit. Nine patients were female and 6 patients were male. One to one's were initiated for impulsiveness (3 times), agitation (5 times), and confusion (7 times). See Table 3.

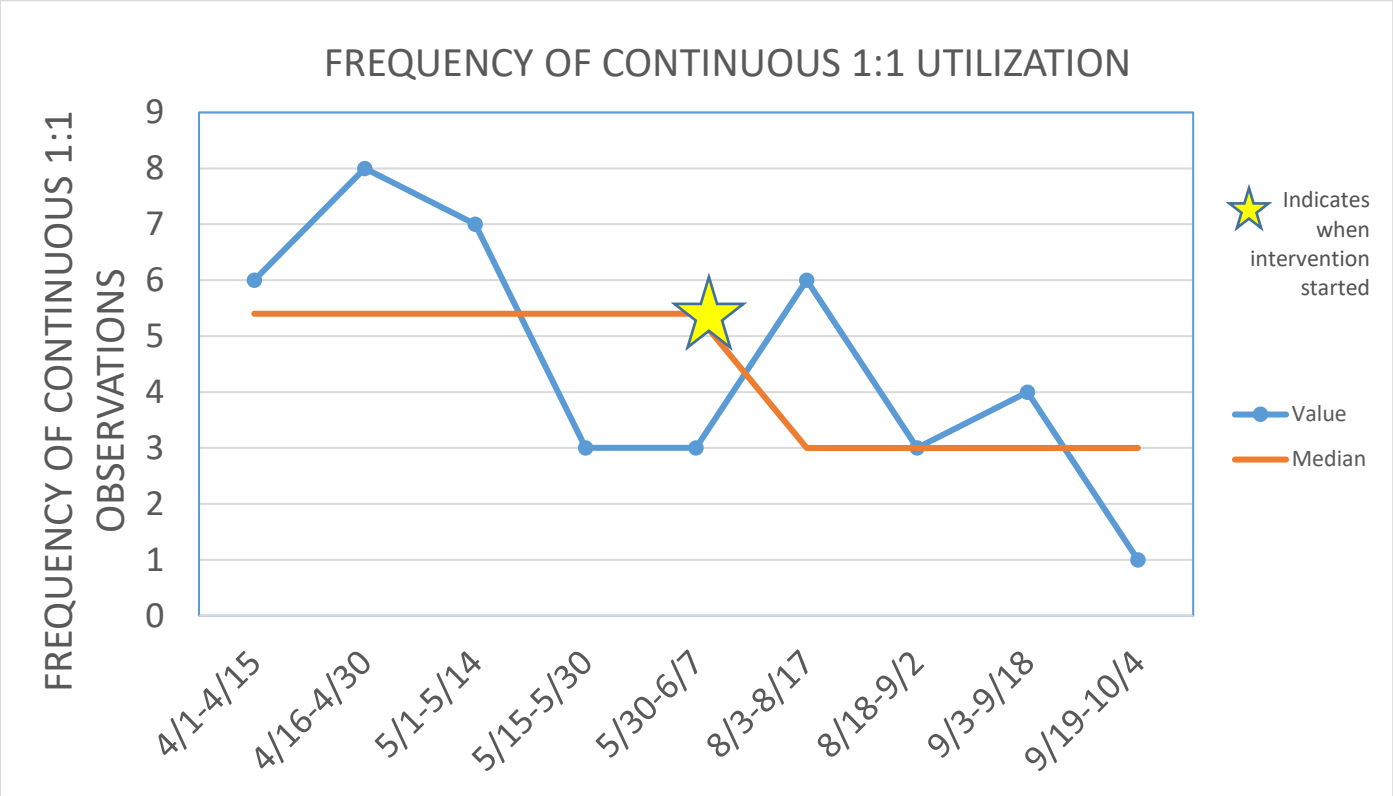
Table 3
Continuous 1:1 Utilization Data

	Pre-Implementation (*n*=27)	Post-Implementation (*n*=15)
	n	*n*
Patient Gender		
Female	11	9
Male	16	6
Reason for 1:1 Observation		
Impulsive	13	3
Agitated	3	5
Confused	10	7
Multiple Reasons	1	

As seen in Figure 2, for the two months pre-implementation, the bi-weekly median number of continuous 1:1 observations was 5.4 on the ACE unit. Post-implementation, the bi-weekly median number of continuous 1:1 observations was 3.0 on the ACE unit.

Figure 2

Frequency of Continuous 1:1 Utilization



Contextual Elements

The choice was made to wait until all the ACE unit CNAs and RNs completed the educational intervention to deploy the post-survey since the dynamic delirium module was viewed at different times. Although the pre-survey included responses from 51 employees, during the months leading up to the post-survey there was significant attrition of CNAs and RNs from March 2020 until October 2020 as 11 employees resigned. Due to contextual elements, there may have been an even greater improvement in post-intervention scores if more participants had completed the survey immediately following the end of the education. Overall, the total scores indicated that there was a small improvement in delirium knowledge for both the CNAs and RNs on the ACE unit after viewing a dynamic evidence-based delirium education

module reinforced by delirium huddle sheets. However, several questions in the pre-survey were answered incorrectly by a majority of the CNAs and RNs. In the post-survey, two of the four questions were still answered incorrectly although, the number of CNAs and RNs who answered incorrectly decreased after viewing the dynamic education module. The questions in the pre-survey that staff answered incorrectly are presented in Table 2.

Table 2

Frequencies and percentages of correctly responded questions

QUESTION	CORRECT ANSWER	PRE-SURVEY TOP RESPONSE (n=51)	POST-SURVEY TOP RESPONSE (n=32)
"Males are more at risk for delirium than females." True/False	True	False; 32 (62.7%)	False; 17 (56.7%)
"Of the features listed below, which is the most important in determining whether a patient has delirium: confusion, inattention, memory impairment, psycho-motor agitation?" Multiple-Choice	Inattention	Confusion; 27 (52.9%)	Confusion; 21 (70%)
"Which of the following is **not** a predisposing factor for development of delirium?" Multiple-Choice	Female Gender	Female Gender; 22 (43.1%)	Female Gender; 15 (50%)
"What are three sub-types of delirium?" Multiple-Choice	Hypoactive, Hyperactive, Mixed	Hypoactive, Hyperactive, Mixed; 24 (47.1%)	Hypoactive, Hyperactive, Mixed; 22 (73.3%)

Prior to the dynamic education module, the survey assessed whether the CNAs and RNs were familiar with delirium prevention strategies, protocols, and interventions such as the Hospital Elder Life Program (HELP) and the Confusion Assessment Method (CAM). Fourteen staff

members (27.5%) had previously heard about the Hospital Elder Life Program and 31 staff members (60.8%) reported they were familiar with Confusion Assessment Method.

Despite COVID-19, nursing leadership on the ACE unit wanted to move forward with education for the staff because delirium is highly prevalent on the unit (PPMC Nursing Leadership, 2020). Prior to COVID-19, the staff requested education to support them in caring for patients with delirium. Therefore, this was an opportune moment to continue education. Unfortunately, throughout the project timeline, nursing staff attrition on the ACE unit played an intricate part in the outcome measures of this project.

Discussion

Key Findings

There were two aims of this quality improvement project: 1) to assess the effect of an evidence-based education intervention on the ACE unit CNAs and RNs knowledge of the prevention, assessment, and interventions for delirium; 2) to assess the effect of an evidence-based education intervention on the continuous 1:1 observation utilization on the ACE unit two months post the evidence-based dynamic education intervention compared to the two-month baseline continuous 1:1 observation utilization. The findings supported a small improvement in delirium knowledge among the nursing assistants and nurses on the ACE unit as well as a decrease in 1:1 utilization. Post-survey scores improved 1.74 for the certified nursing assistants and 1.2 for the registered nurses from the pre-survey scores. Continuous 1:1 utilization data showed a decrease of 1.4 in the average number of the biweekly continuous 1:1 observations

over the two months following the implementation of the educational intervention. The median usage of continuous 1:1 observations decreased from 5.4 to 3.0.

Strengths

Given the individual and institutional burden associated with delirium, early recognition of delirium is instrumental in caring for patients 70 years old and older. This quality improvement project was designed to address delirium knowledge of the certified nursing assistants and nurses on the ACE unit at PPMC and to reduce hospital costs. Effective evidence-based education, resources, interdisciplinary planning and communication amongst the team is essential for preventing, identifying, and treating delirium as well as providing quality patient care (Fong, Tulebaev, & Inouye, 2009). Several staff members throughout this project commented on how the dynamic delirium education supported their continuing education needs and, although they had been geriatric nurses for a period of time, they learned new information (Personal Communication with ACE unit RNs, 2020). This quality improvement project emphasized the importance for the certified nursing assistants and nurses to recognize delirium signs and symptoms as well as built an educational foundation to support the assessment, prevention, and interventions for delirium when caring for this patient population. Analysis of this project has shown that a dynamic delirium educational module supported continuing education with improvements in knowledge and decreased 1:1 utilization.

Comparison of Results

Delirium is a frequent and costly complication of hospitalization in older adults and serves as a healthcare quality indicator for older patients (Rubin et. al, 2011). The Hospital Elder Life Program (HELP) is an evidence-based program that focuses on prevention, early

identification and management of delirium (Rubin et al., 2006). The protocols from the HELP model and the CAM were included in the dynamic education module along with huddle sheets provided to the nursing assistants and nurses however, the full HELP model intervention was not implemented on the ACE unit. This is an important distinction as the HELP intervention assists in preventing delirium in 40% of hospitalized older adults and uses trained volunteers to support the CNAs and RNs on the units (Fong, Tulebaev, and Inouye, 2009; Ghaeli et. al, 2018; Sandhaus, Harrell, & Valenti, 2006). Outcomes included a lower incidence of delirium, shorter length of stay, greater satisfaction of patients, families, and nursing staff, and significantly lower costs for the hospital (Rubin et. al, 2011). However, delirium prevention was not one of the aims of this quality improvement project.

The REVIVE study also utilized the HELP model and showed that volunteer continuous observers assisted in patient care and comfort. Intervention patients were less likely to have cognitive or functional decline working with a continuous 1:1 volunteer observer. These volunteer observers assisted in patient care and comfort without effecting staffing ratios on the floor (Caplan & Harper, 2007). Multicomponent interventions targeting specific risk factors for delirium through education of health care staff and improvement of the environment of the patient are effective in reducing the incidence, severity, and duration of delirium as well as cost-effective in preventing delirium when applied to patients at risk of delirium in a hospital setting (Cerejeira & Mukaetova-Ladinska, 2011). The dynamic evidence-based educational intervention focused specifically on CNA and RN delirium education.

Delirium prevention strategies have demonstrated to be instrumental in the prevention of cognitive and functional decline (Rubin et. al, 2011). If the certified nursing assistants and nurses on the ACE unit continue to engage in delirium education to support their clinical

practice, accessibility to screening tools, prevention strategies, and treatment algorithms, there will be continued opportunities for improved patient outcomes and for decreased use of health system resources.

Impact of the Project

After the dynamic delirium education intervention was implemented on the ACE unit, there was a small overall improvement in delirium knowledge amongst the nursing assistants and registered nurses to assess, prevent, and intervene in patients with delirium. There was also a decrease in the mean number of continuous 1:1 observations on the unit. In addition, delirium prevention strategies and a screening tool were provided to the staff for continued use to support their clinical practice in caring for the delirium patient population.

Obtaining outcome measures was increasingly difficult due to a significant turnover in both nursing assistants and nurses. Anecdotal observations from nursing leadership reported 11 resignations on the ACE unit from March 2020 through October 2020 (personal communication with nursing leadership, September 2020). Several nursing assistants resigned or transferred to other units in the hospital and health system and nurses took leaves of absence which influenced the response rate on the post-intervention survey for this quality improvement project. In fact, the departments turnover rate in September 2019, 6.67%, increased to 12.77% in September 2020 (PPMC Human Resources, 2020).

Costs

Continuous observation can be challenging for various reasons. It is costly to pay a certified nursing assistant or patient care observer to monitor a single patient for an entire shift. It's also difficult to anticipate the number of continuous 1:1 observers needed for a given shift,

since the need varies depending on the number and characteristics of patients requiring continuous 1:1 observation. Many times CNAs are reallocated or reassigned from a unit where they cared for several patients, to observe one patient which can cause a shortage of caregivers for other patients throughout the hospital. On average, between $388 ($16.16 per hour (PCO)) and $517 ($21.55 per hour (CNA)) is spent per 12-hour shift caring for one patient on a continuous 1:1 observation at Penn Presbyterian Medical Center. Prior to the start of this project in March 2020, $116,245 was spent in FY20 (July 2019 to March 2020) on continuous 1:1 observations on the ACE unit which is 3.9 full time equivalents (FTE's) and 5,526 hours of continuous 1:1 observers. A total of 41.07 FTE's were utilized at PPMC for continuous 1:1 observers, accounting for $1,792,123 spent in FY20 (July 2019 to June 2020). As of October 2020, after the implementation of the dynamic delirium education module the ACE unit utilized 4.3 FTE's, 3,004 hours of continuous 1:1 observers, at a cost of $61,796 of the $567,009 (39.49 FTE's) spent throughout all the units thus far at PPMC on continuous 1:1 observations this far in FY21, July through October 2020. In comparison, in October 2019 the ACE unit utilized 4.5 FTE's, 3,172 hours of continuous 1:1 observers, at a cost of $65,771 of the $629,091 spent throughout all the units at PPMC on continuous 1:1 observations in FY20, July through October 2019. This was a reduction of .2 FTE's, a cost savings of $3,975 compared to the same time frame in FY20.

Limits to the Generalizability

Although it was initially discussed to collect repeated measures of knowledge on delirium within the same group of certified nursing assistants and nurses, unpaired data was collected to compare the pre-and post-delirium knowledge of certified nursing assistants and nurses on the ACE unit after the dynamic delirium module was implemented. Due to the unanticipated attrition

of staff, the sample size dropped from 51 to 30. Eleven staff members left the unit during this project due to various reasons with only 40 staff members left to be surveyed. The decision was made to close the post-survey after 20 RNs and 10 CNAs had completed the post-survey. Due to COVID-19, there was a pause of research throughout the University Pennsylvania and the original nursing staff participating in the project were lost due to attrition on the unit from March 2020 through October 2020. The generalizability of this quality improvement project was further limited by the implementation on only one unit in the hospital. Education was provided to the nursing assistants and nurses on the ACE unit through the dynamic delirium education module and reinforced through huddle sheets with the Hospital Elder Life Program (HELP) protocols and the Confusion Assessment Method (CAM). However, neither the model nor the screening tool were implemented into daily clinical practice on the ACE unit. Internal validity may have been limited by the investigator developed survey.

Conclusion

This quality improvement project highlighted several important areas to address for sustainability. The success of this project should be built upon using continuous quality improvement approaches. Attrition of nursing assistants and nurses signals the need for continuing efforts in delirium education. To understand the full impact on continuous 1:1 observation utilization it will be important to monitor this outcome for a longer period of time. As nurse leaders, we are agents of quality improvement and must create a systematic approach to sustaining education and keeping the staff engaged. We also create the conditions for and effectively oversee quality improvement initiatives to maintain system performance. Quality improvement and quality planning are key elements to this project's sustainability. It was essential to establish and maintain a culture of high performance. Moving forward, all the

stakeholders must be accountable in order for the processes of this quality improvement project to be successful. Implementation of delirium prevention strategies to provide safe, efficient, quality care for the patients on the ACE unit will need to continue in order for education to be consistent with the department goals. Standardization of practice, transparency, and communication with the interdisciplinary team are also essential for the sustainability of this project.

This evidence-based education quality improvement project helped to decrease continuous 1:1 observation of older adults with delirium by increasing the ACE unit CNAs and RNs knowledge on how to prevent, assess, and intervene early to manage delirium in older adults on the ACE unit at Penn Presbyterian Medical Center. The pre-survey suggested there was a lack of knowledge regarding standardized tools and delirium preventative strategies. Previously, delirium education was not provided to the staff on the unit nor was a standardized tool for delirium prevention strategies in the electronic record to help screen for delirium. Following the dynamic evidence-based delirium education module, knowledge among certified nursing assistants and nurses on the ACE unit improved. Future considerations would be to engage in a continuous quality improvement project to promote delirium education and to update resources for use on the unit in order to support continued improvement. The unit may also consider an accessible evidence-based screening tool utilized through the electronic medical record or delirium treatment algorithm to promote standardization and closed loop communication with patients who present with delirium.

This quality improvement project was initiated to benefit and support the certified nursing assistants and registered nurses on the Acute Care of the Elders Unit (ACE) at Penn Presbyterian Medical Center and to decrease continuous 1:1 observation utilization costs. There

were improvements in knowledge of both the certified nursing assistants and nurses regarding delirium prevention, recognition, and management. In addition, there was a decrease in the median bi-weekly continuous 1:1 observations on the ACE unit during the two months following the evidence-based dynamic delirium education provided to the certified nursing assistants and nurses. This indicates the need for continuous quality improvement processes to address delirium knowledge and decrease continuous 1:1 observations on the ACE unit. Due to staff turnover on the ACE unit, it is recommended that a continuous quality improvement process be implemented around delirium assessment, prevention, and interventions to support the certified nursing assistants and nurses clinical practice in providing safe and quality care to the delirium patient population.

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