Using Implementation Science to Facilitate

Evidence-Based Practice Changes

By

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NUSING IMPLEMENTATION SCIENCE TO FACILITATE
EVIDENCE-BASED PRACTICE CHANGES

Abstract

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Implementation Science is a relatively new field that focuses on discovering strategies to reduce the gap between research and practice. The revised Promoting Action on Research Implementation in Health Services (PARIHS) framework was used to improve implementation of an evidence-based project that was designed to reduce the impact of delirium on hospitalized, older patients. Interventions were based on the core elements of the PARIHS framework: evidence, context, facilitation and successful implementation. Solutions centered on providing adequate and appropriate resources and clarifying roles. Specific recommendations included enhancing training and improving communication.
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For many years health care research has concentrated on discovering new medications, devices, procedures and interventions. Efforts to integrate these discoveries into practice include developing evidence-based protocols and guidelines that are designed to improve health outcomes. However, much of this effort never reaches the population it is designed to help. According to recent research only 55% of American adults receive the recommended care (McGlynn, et al. 2003). Consequently, millions of healthcare dollars are potentially wasted in an era of diminishing resources. Implementation Science addresses this problem by focusing on methods and strategies to more efficiently close the gap between research and practice (Grimshaw, Eccles, Lavis, Hill, & Squires, 2012).

The National Institutes of Health (NIH) defines implementation as “the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings” (U.S. Department of Health and Human Services, 2009, "Research Terms," para. 1). The peer reviewed journal, Implementation Science, defines implementation research as “the study of methods to promote the systematic uptake of proven clinical treatments, practices, organizational, and management interventions into routine practice, and hence to improve health” (Implementation Science, 2013, “Aims and Scope,” para. 2). Implementation science can be complex or as simple as provider cues. For example, a simple action of putting a red notice on the front of charts increased the rate of statin prescribing to 94% of patients. The rate of statin prescribing in the control group was 10% (Glagow, et al. 2012). Implementation of evidenced-based practice (EBP) in hospitals or within complex medical systems is challenging, but necessary to promote safe, high quality patient care. The purpose of this paper is to illustrate how Implementation Science can be used to improve planning, initiating, and maintaining new EBP protocols. One health system’s experience implementing EBP protocols designed to reduce the
frequency, severity and duration of delirium in hospitalized orthopedic patients will be used as an exemplar. The revised framework Promoting Action on Research Implementation in Health Services (PARIHS), which has been shown to have construct and content validity (Kitson, et al. 2008), will guide the discussion.

**Literature Review**

Three searches of Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed were conducted regarding Implementation Science. The first was to clarify the definition and need for Implementation Science using the “abstract available”, “free full text”, “ten year” filters and key term “implementation science” and resulted in 23 articles. Another search was conducted using the key terms “evidence-based practice” and “implementation” and resulted in 10 articles. The third search was conducted to find a suitable framework on which to base the evaluation of the exemplar using the same filters and key terms “implementation science”, “framework” and “hospital” and resulted in four articles. These articles were read and 19 articles selected as important. Seventeen applied to the definition and need for Implementation Science. Two were related to a suitable framework.

To address the question regarding the effectiveness of a clinical tool, searches of CINAHL and PubMed were conducted using the key words “delirium” and “recognition” with limits of “English,” “65+ years old” and “full text.” To address the effectiveness of intervention strategies, searches of CINAHL and PubMed were conducted using the key words “delirium,” “intervention,” “outcomes,” “prevention,” “hospitalized,” and “hip fracture” with the limits of “English,” “full text” and “65+ years old.” These searches resulted in 93 articles. The article titles and abstracts were reviewed for applicability. Of these, 38 articles were read and evaluated for relevance and seven articles were selected. Three articles were related to the effectiveness of clinically relevant rating scales to measure delirium, two applied to intervention protocols to
improve outcomes one year after hip fracture, and two examined one year outcomes. A summary of the relevant literature will provide background for this paper and for the application of the revised PARIHS framework.

**Background**

Delirium is an acute, fluctuating change in cognition characterized by decreased ability to attend to the environment and may be accompanied by confusion, disorientation, memory impairment, changes in consciousness, disordered thinking, perceptual disturbances and psychomotor agitation or depression (Inouye, 2003). The causes of delirium are not fully understood but they are thought to be multi factorial (Holroyd-Leduc, Khandwala & Sink, 2010). Preexisting risks for delirium include advanced age, decreased cognitive ability, and co-morbid conditions, including substance abuse and depression. Decreased hearing, vision and mobility also are predisposing factors (Waszynski & Petrovic, 2008).

Delirium is a major complication among hospitalized older adults. It leads to poor outcomes including increased morbidity, mortality, length of stay, cost of care and institutionalization (Rosenbloom, Henneman & Inouye, 2010). Delirium is frustrating for nurses and frightening for families. It is also a source of fear and suffering for affected individuals. Patients with delirium are unable to participate in their own care putting them at higher risk for other complications.

Although delirium is common in hospitalized older adults, most cases remain undetected by nurses (Waszynski & Petrovic, 2008; Steis & Fick, 2008). Nurses often attribute the signs of delirium to dementia, confusion or the stress of a new environment. Typically, nurses resort to brief, unstructured assessments of cognition to identify delirium because they have not been educated to use assessment tools that can effectively detect the signs of delirium. A review of 10 original research studies (n=10) that investigated nurses’ abilities to identify delirium revealed
that nurse recognition rates ranged between 26% and 83%, with rates in most studies being low (Steis & Fick, 2008). Cognitive assessments by nurses were superficial and missed the key symptoms of delirium (Steis & Fick, 2008); however, there are assessment instruments that can improve recognition. Wei, Fearing, Sternberg, and Inouye (2008) performed a systematic review of the literature to characterize the psychometric properties of a delirium assessment tool, the Confusion Assessment Method (CAM). In this review, data from seven high quality studies were combined and the investigators reported that the CAM was 94% sensitive and 89% specific for detecting delirium.

In addition to recognizing delirium, nurses need to be educated in methods to prevent delirium and be empowered to initiate intervention strategies. These strategies include optimizing nutrition, hydration, mobility, activities of daily living, pain control and sleep (Holroyd-Leduc, Khandwala & Sink, 2010). Nurses and physicians also lack awareness of deliriogenic medications and the most effective pharmacologic strategies for treating symptoms of delirium.

Comprehensive approaches to preventing, detecting, and treating delirium can improve patient outcomes. In a longitudinal, prospective, sequential study (Milisen et al., 2001), a baseline cohort comprised of 60 older adults with hip fracture received care as usual and the second cohort of 60 older adults with hip fracture received a multimodal screening intervention which included (a) educating nursing staff, (b) systematic cognitive screening, (c) consultation with a delirium resource nurse, geriatric nurse specialist, or a psycho geriatrician, and (d) scheduled pain protocol. The incidence of delirium was 23.3% in the baseline cohort that received care as usual and 20% in the intervention group (P=.82). Although the drop in incidence was not significant, the decreases in duration and severity were. The median duration of delirium
was four days for the baseline care as usual cohort and one day for the intervention group (P=.03). Severity was also decreased (P=.0049). Similarly, in a prospective, randomized, blinded trial (Marcantonio, Flacker, Wright, & Resnick, 2001) involving 126 patients with hip fracture, 64 (n=64) were randomized to usual care and 62 (n=62) were randomized to receive proactive geriatric consultation. There was no difference in the length of stay between the two groups, but delirium incidence was cut from 32% to 20% (P=.04) and severe cases were reduced from 29% to 12% (P=.02) in the geriatric consultation group.

**Delirium EBP Project**

**Methods**

An EBP project, targeting orthopedic patients who were at high risk for delirium, was implemented at two affiliated urban hospitals between 2010 and 2012. The project was deemed to have exempt status by the local Institutional Review Board. Nurses on the orthopedic units were trained to use the Confusion Assessment Method (CAM), an evidence-based, clinically relevant rating scale used to measure delirium (Wei, Fearing, Sternberg, & Inouye, 2008). During the first 6 months of the project, patients were assessed for delirium on admission and daily using the CAM assessment to establish nurses’ skills using the CAM and to obtain a baseline rate of delirium. At the beginning of the seventh month, the intervention phase of the EBP project was initiated. Use of CAM continued and delirium prevention, diagnostic and treatment protocols, developed by an inter-professional task force based on a synthesis of the evidence-based literature, were implemented for patients at high risk for delirium. Unit-based population data including rates of delirium (based on administrative ICD-9 coding), length of stay and discharge disposition were compared using pre-intervention (July 1, 2009-June 30, 2010) and intervention (July 1, 2011-June 30, 2012) cohorts.
Findings and Implications

Delirium rates documented by ICD-9 coding were below reported rates of delirium (Table 1), which can be as high as 56% in this population (Hempenius et al., 2011). Our finding suggested that many cases of delirium were not being appropriately assessed and/or diagnosed despite nurses having received the CAM training and physicians having received presentations related to delirium and the EBP project. Our findings may reflect two main challenges encountered during project implementation. First, despite CAM training and protocol monitoring, nurses inconsistently used the CAM and, in some instances, incorrectly used the CAM. Second, physicians inconsistently ordered the protocols, and even when ordered, may not have documented a diagnosis of delirium in the medical record. Despite the lack of change in the incidence of delirium, length of stay and mortality for those diagnosed with delirium were reduced for the cohort that received care following protocol initiation (Table 1). Based on these encouraging findings, the task force sought solutions to promote nurses and physicians to adopt and maintain evidence based care for delirium using CAM and the associated protocols.

Application of Implementation Science

Background and Overview of PARIHS Framework

The original PARIHS framework was designed as a way to address the complexity of the implementation process by providing an organized structure on which to design an implementation plan. This structure is composed of three core elements; evidence, context and facilitation. The inter relationship of these three elements captures the dynamic process of implementation; therefore, enhancing understanding and applicability (Kitson, et al., 2008). The revised PARIHS framework further clarifies terms and adds a diagnostic element, successful implementation, to evaluate and refine an implementation plan. To this end, the revised PARIHS
framework is offered in a guide that provides examples and pragmatic suggestions to help researchers operationalize the elements and sub-elements of the framework. In this paper, we apply the revised PARIHS framework to demonstrate strategies for improving hospital-wide implementation of the delirium prevention, diagnostic and intervention protocols. Core elements and sub-elements of the revised PARIHS framework are defined and a description of how the elements will be used to enhance hospital-wide implementation of the delirium protocols is provided.

There are many good recommendations in the guide that accompanies the revised framework; however, this exemplar focuses on identifying and resolving barriers encountered in our EBP project to improve both delirium assessment (i.e., use of CAM) and consistent use of the delirium protocols. Our analysis will be focused, for the sake of simplicity, on the task-oriented aspects of the project as they related to the core elements and sub-elements of the revised PARIHS framework. The four core elements of the revised PARIHS framework are: (1) evidence and EBP characteristics, (2) context, (3) facilitation, and (4) successful implementation. Each core element is defined or clarified by sub-elements (Stetler et al., 2011) as shown in Table 2.

Evidence

The first core element, evidence and EBP characteristics, is comprised of formal research, clinical experience, patient preferences and local practice information (Stetler et al., 2011). In regard to the delirium exemplar, an inter-professional task force reviewed the literature on delirium published from 2001 to 2011. Although research on delirium was scant in 2001 it increased greatly in the following years and now provides a rich source of evidence based interventions. The inter-professional task force was comprised of experienced physicians, nurses,
pharmacists, physical therapists and social workers who were actively engaged in practice at the participating hospitals. Thus, the second sub-element of evidence, clinical experience, was a strong attribute in developing this EBP project. The delirium assessment instrument, the Confusion Assessment Method (CAM), and the delirium prevention, diagnostic and intervention protocols arose from systematic reviews of the literature. The resulting protocols were then discussed and evaluated by the team members. This inter-professional approach resulted in holistic protocols that were not limited to the perspectives of one or two professions.

The next sub-element of evidence is patient preferences. Patient preferences were integrated into this EBP project by involving families and receiving feedback from families in the care activities proposed in both the prevention and treatment delirium protocols. The Task Force included patient stories and knowledge of self (Stetler et al., 2011) by incorporating them into clinical wisdom used to develop the protocols. This was particularly important because patients and families are integral to preventing delirium in patients at high risk for delirium, and they need support and encouragement to cope with symptoms if delirium occurs.

A third sub-element of evidence is local practice. Local practice includes financial factors, performance improvement studies and context-specific barriers and facilitators. The delirium EBP project had both strengths and challenges related to finances. A grant from the hospitals system’s foundation provided compensation to nurses affiliated with the task force to train staff nurses and to facilitate deploying the project. However, tight nurse staffing based on the hospital system’s budget resulted in time constraints for staff nurses that were attempting to adopt delirium assessment and protocols into practice.

EBP characteristics, as part of the first core element, represents one of the most challenging aspects of this EBP project. Of importance is whether the EBP can be implemented within the
organization and whether results are measurable (Stetler et al., 2011). From a structural perspective, there were no barriers to EBP project implementation. Implementation challenges primarily related to changing the culture of the hospital units involved in this EBP project so that delirium assessment and protocol implementation was prioritized by both nursing and medical staff in lieu of continuous time limitations imposed by budget-constrained staffing levels. Several strategies were implemented in an attempt to help staff adopt delirium assessment and protocols, including nursing and medical staff education, using both group and one-to-one interactions, engaging unit leadership, and monitoring and cueing staff. Despite these strategies adoption and maintenance were inconsistent.

**Context**

*Context* sub-elements are leadership support, culture, evaluation and receptivity. Sandstrom, Borglin, Nilsson and Willman (2011) defined leadership as an “interpersonal process that influences goal attainment in a group” (p. 213). Strong leadership and mastery of skills promotes the implementation of EBP (Sandstrom et al., 2011). A strong leader provides support, accessibility and good communication (Sandstrom et al., 2011). Feedback, interest and engagement are also important (Sandstrom et al., 2011). In the delirium EBP project, leaders consisted of a physician and staff nurse with strong leadership skills and expertise caring for patients with delirium.

Supportive organizational culture promotes supportive leadership. Sandstrom et al. (2011) describes the supportive organization as one that provides physical research resources such as libraries and access to data bases. Allowing time for nurses to read research while on duty is also important. A research mentor, education in research methods and opportunities to participate in research should also be available (Sandstrom et al., 2011). Policies and documentation should
also be conducive to EBP. Culture can be described as the way things are done (Stetler et al., 2011) and EBP should be considered the cultural norm (Sandstrom et al., 2011).

The hospitals that sponsored the exemplar had many supportive attributes. Management espoused EBP as a goal and nurses received positive feedback for involvement. Time on EBP nurse practice committees and education activities were compensated, but had to be completed in addition to regular work hours. Policies were upgraded to reflect EBP through nurse practice committees. However, there was no support for the nurses to read research or participate in research activities on paid time. One of the system’s two hospitals did not have a library and nurses had difficulty accessing databases from home. In regard to the delirium EBP project, documenting patient assessments and care was cumbersome and did not reflect EBP. As previously mentioned, staffing patterns allowed little or no time to train nurses to use the delirium assessment instrument (CAM) and protocols. Workload made it challenging to adopt new activities. Also, staff turnover was high due to retirements which made consistent training difficult.

The third sub-element of context, adequate evaluation resources, includes three main attributes: the ability to gather, easily access and use data relevant to the EBP implementation. Relevant data should be collected and available within the organization, but can also be augmented from outside sources. The data that is gathered should be relevant to the EBP and available to stakeholders in a form applicable to their needs. There should be a mechanism for data to be gathered consistently from the past, now and in the future in order to sustain EBP (Stetler, et al., 2011, “Context Reference Tool” p. 5).

In the case of the delirium EBP project, systems were in place to gather data on length of hospital stay, disposition on discharge from the hospital, death and readmission. This
information was routinely gathered so it was available for the periods before, during and after the project implementation. While the data from the hospital was relatively accurate because the factors were quantitative and discrete, the information from the CAM assessments was harder to interpret. CAM assessments were not universally completed for patients in the target population and not all assessments were done correctly which weakened the effect of the protocols on patient outcomes.

The last sub-element of Context, receptivity to innovation or change offers insights into possible solutions. Receptivity to the innovation is described by the PARIHS guide as “readiness or fit of critical features of the environment as they specifically relate to the targeted EBP” (Stetler et al., 2011, “Context Reference Tool” p. 7). These critical features include resources, space, decision-making authority and fit with strategic goals of the organization. In regard to the delirium EBP, there was secure space for storing confidential papers, meeting room space was adequate and teleconference capabilities provided communication avenues for task force members from the two hospitals. The task force had the authority to make decisions regarding the protocols, but input from pharmacy and approval from physicians that would use the orders was solicited to strengthen the protocols and promote adoption. The project fit with two of the organization’s strategic goals, patient safety and financial stewardship. Delirium is a patient safety issue because it can lead to poor outcomes and decreasing the frequency and severity of delirium enhances patient safety. Delirious patients require more intensive care and have longer length of stays (Rosenbloom, Henneman & Inouye, 2010) reducing the net revenue from these patients.

The feature of adequate resources was the most problematic for this project. Stetler, et al. (2011) in the PARIHS guide lists staff, experts, champions, hardware, software, financial and
change agent resources as necessary for readiness ("Context Reference Tool" p. 7). Hospital management embraced change and encouraged staff to do so; however, all of the other resources were insufficient. Staffing at the time of the project was adequate for safety but nurses did not have the time or cognitive reserve to complete extra assessments and documentation. It was difficult to get nurses to spend the time to be trained in the CAM assessment during their shifts. There was a staff nurse champion at one of the hospitals, but she was also working on the unit. There was not a consistent nurse champion at the other hospital. Several nurses fulfilled that role during the months of this EBP project, but they were not wholly engaged and invested in the project and the nurse champion role was inconsistently implemented. There were adequate computers available, however the software lacked appropriate cues and required separate documentation. The delirium assessment and protocols were not integrated into the electronic health record necessitating a paper work flow that required cueing. Grant money paid for staff members to ensure that forms were on charts and assessments were completed. Never-the-less, the nurses were unable to implement the EBP every day resulting in inadequate adoption. The next element, facilitation, may elucidate strategies to prioritize and optimize resources.

**Facilitation**

The guide from the revised PARIHS framework defines facilitation as "A deliberate process of interactive problem solving and support that occurs in the context of a recognized need for improvement and a supportive interpersonal relationship" (Stetler, et al., 2011, "Facilitation Reference Tool," p. 2). The sub-elements of facilitation include role of the facilitator and, other implementation interventions.

According to the PARIHS guide (Stetler, et al., 2011) the role of the facilitator includes purpose, expectations and activities, and skills and attributes of facilitator. Internal and external
facilitation are aspects of purpose. External facilitation may come from outside the group; whereas, internal facilitation comes from inside the group. External facilitation involves more holistic approaches that develop attitudes toward the desired change in behavior. For example, external facilitation may include continuing education articles about EBP approaches to delirium in journals read by the nurses participating in the EBP project. Internal facilitation is more task-oriented and directed at specific behaviors. It usually involves a representative of the group that will be performing the desired behavior change, for example, the nurse champion teaching the nurses how to implement the CAM assessment.

Expectations of the facilitator include developing a supportive relationship with the staff (Dogherty et al., 2010). This includes mentoring, role modeling, shared decision making, recognizing staff efforts (Dogherty et al., 2010) as well as empowering staff to act on their own (Stetler et al., 2011). Nurse champions from the task force were available at both hospitals several hours a week for role modeling, consultation and mentoring. Nurses were able to initiate nursing interventions as appropriate, taking patient preferences into consideration. They were able to collaborate with physicians by informing them of patients at high risk or with a positive CAM and by discussing which aspects of the diagnostic and treatment orders were appropriate.

Activities of the facilitator include regular communication with the individuals performing the desired behaviors to clarify information and gather information from them. A nurse champion in each hospital monitored the use of the CAM assessments and brought questions back to the task force. Also, a survey was emailed to all of the nurses involved in the project and further recommendations solicited. An additional approach would be to allow the nurse champions to gather information from the staff through structured interviews. Discussions that accompany structured interviews may have further elucidated barriers and facilitators and offered
opportunities for brainstorming solutions. Stetler et al. (2006) suggests that the interviews contain questions about the usefulness of the interventions, satisfaction with the process, reasons why they did or did not use the intervention, other barriers and facilitators and any recommendations for future implementation.

Another activity of the facilitator is to provide technical and practical assistance through access to expertise and research information. Acting as the facilitator, the task force members provided staff, managers and physicians with education through meetings, online education and one-on-one discussion. Additional training and addressing knowledge gaps during structured interviews could augment problem solving and reduce resistance from clinicians.

These activities are important because they attempt to fit the interventions into the local context which is critical for success (Dogherty et al., 2010). In this EBP project, resources were not sufficient to provide dedicated time for the task force members or their delegates (e.g., nurse champions) to accomplish many of the facilitator activities that promote EBP adoption and maintenance. Resources to provide dedicated paid time to implement these functions would support successful implementation.

The third feature of the sub-element, role of facilitator, is the skills and attributes of the facilitator. Stetler et al. (2011), list skills and attributes that may be important. Important skills are: communication, implementation science expertise, organization, marketing knowledge, technical expertise and problem solving abilities. Facilitator attributes include authenticity, credibility, accessibility, responsiveness and self confidence. The task force members, in the role of internal facilitator, individually and collectively had many of these attributes. A physician, nurse and pharmacist provided clinical, research, technical and regulatory expertise. The task force physician had excellent organizational skills which were supported by social work and
administrative staff. However, the task force did not include any members from the hospitals’ performance improvement team and doing so may have been very valuable. The task force also lacked expertise in Implementation Science. In addition to the research on delirium, the task force would have been well served to review the literature on Implementation Science and use a framework such as revised PARIHS to guide this EBP project. The task force recognized this error and will explicate later in this paper how implementation science will inform strategies to improve hospital-wide implementation, adoption, and maintenance of the delirium protocols.

The second sub-element of facilitation is other interventions as related to the elements evidence and context. According to Stetler et al. (2011) the “other interventions” sub-element of facilitation is primarily directed at discrete interventions that can improve the use of EBP. These interventions can range from simple environmental cues and reminders to complex multifaceted interventions. Casper (2006) found that simple environmental cues can lead to goal attainment. This EBP project used notes and flags in the paper charts to encourage completing CAM assessments and initiating delirium prevention, diagnostic and treatment protocols. The strategy was successful on the days that the nurse champions were able to work on the project, but the effectiveness was reduced because resources were not available to have nurse champions working with unit staff on a daily basis. Solutions include finding a champion that could incorporate these functions into their normal activities, using a volunteer champion from the staff or applying for grant money to cover the cost.

**Successful implementation**

The fourth element of the revised PARIHS framework is successful implementation. Sub-elements are: implementation plan is actualized, EBP is integrated into care and, patient and organizational goals are achieved (Stetler et al., 2011). The delirium EBP pilot project was
partially successful. Patient and organizational goals were achieved in that length of stay was reduced for those patients that were diagnosed with delirium. The plan was actualized in that the EBP protocols were implemented and followed for a significant portion of older adults following orthopedic surgery who were at risk for delirium. However, integration of the delirium EBP into care was not as successful. Assessments were inconsistently completed, with many being completed only on the patient’s first post-operative day. Data from the CAM assessment forms showed a very low initial rate of delirium; however, due to the incompleteness of the data it was difficult to determine the accuracy of this conclusion.

Conclusions and Recommendations

Applying the revised PARIHS framework to the delirium EBP project allowed us to objectively determine how to improve adoption and maintenance of the delirium EBP when it is implemented throughout the participating hospitals (see Table 3). Two main problems in EBP implementation were discovered: incorrect and inconsistent use of the CAM delirium assessments. The probable causes of these shortcomings were inadequate time for training, inadequate staffing to adopt and maintain CAM assessment and protocol implementation, and poor integration of assessments and protocols into work flow. These challenges resulted in an inability to determine the true baseline rates of delirium.

To address these shortfalls during hospital-wide EBP implementation, unit managers will need to provide the resources for adequate training and EBP uptake. It is also imperative that the CAM assessment and delirium protocols be incorporated into the electronic medical record. This would provide for adequate electronic cueing and incorporation into workflow. Electronically capturing CAM assessments and protocol implementation would also provide a mechanism to evaluate uptake and maintenance of EBP as well as track patient outcomes.
The delirium task force is also promoting external facilitation by introducing best practices for delirium assessment, prevention, and treatment to local nursing colleges and seeking to disseminate the project via publication of this paper. The task force should also network nationally through professional and governmental bodies to promote the development of a delirium certification program that would demonstrate that an organization is maintaining EBP for preventing and treating delirium. Raising awareness about delirium and evidence-based interventions to prevent and treat it will help nurses recognize delirium so that they can impact patient outcomes. Effectively preventing and treating delirium will reduce resource utilization and improve patient outcomes.

**Significance to Nursing**

Nurses are in are in a unique position to improve outcomes for patients at risk for delirium. Unfortunately, research shows that nurses are not well informed about delirium and often fail to identify delirious patients (Steis & Fick, 2008). Years of education or experience do not seem to correlate with this knowledge gap (Steis & Fick, 2008). Nurse leaders in practice, research and education arenas must address this knowledge gap so all nurses can provide care that is safe and effective. However, even the most thoughtfully designed protocols are less valuable if they are not successfully implemented. Implementation Science can facilitate translating successful research findings to practice, and thus benefit patients and health care providers. Each attempt to integrate evidence into practice teaches us lessons which can be applied to further studies. Implementation Science provides us with frameworks and knowledge on which we can build a better health care system.
Recommendations for Further Research

Further research should involve reevaluating the project after the full implementation. There is a need for more data on actual implementations in order to clarify what factors contribute to successful implementation, particularly in regard to the contextual environment. There are many implementation frameworks available and additional applications to actual EBP projects could help with consolidation and refinement of these frameworks.
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Table 1

Results from Delirium EBP Project

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<th>Variable</th>
<th>Before intervention</th>
<th>During intervention</th>
<th>Net change</th>
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<tr>
<td>Incidence</td>
<td>1.95%</td>
<td>1.85%</td>
<td>Minus 0.11%</td>
</tr>
<tr>
<td>Length of stay</td>
<td>6.9565 days</td>
<td>5.345 days</td>
<td>1.6115 less days</td>
</tr>
<tr>
<td>Death</td>
<td>3.995%</td>
<td>0.655%</td>
<td>Minus 5.34%</td>
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Table 2

PARIHS Elements and Sub-elements

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<th>Successful implementation</th>
<th>Realization of implementation</th>
<th>EBP uptake</th>
<th>Patient outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and published guidelines</td>
<td>Leadership</td>
<td>Support</td>
<td>Purpose</td>
<td>Expectations and activities</td>
<td>Skills and attributes of the facilitator</td>
<td>EBP uptake</td>
<td>Patient outcomes</td>
</tr>
<tr>
<td>Clinical experience and perceptions</td>
<td>Culture</td>
<td>Evaluation capabilities</td>
<td>Receptivity to the targeted innovation/change</td>
<td></td>
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</tr>
<tr>
<td>Patient experience needs and perceptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Local practice information</td>
<td></td>
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</tbody>
</table>
### Table 3

**Plan to Improve Adoption and Maintenance of the Delirium EBP**

<table>
<thead>
<tr>
<th>Elements and Sub-elements</th>
<th>Pilot Success</th>
<th>Plan for improving hospital-wide delirium EBP Adoption and Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research and EBP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and published guidelines</td>
<td>Yes</td>
<td>Request adequate staffing for EBP uptake</td>
</tr>
<tr>
<td>Clinical experiences and perceptions</td>
<td>Yes</td>
<td>Request adequate resources for CAM training</td>
</tr>
<tr>
<td>Patient experiences, needs, perceptions</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Local practice information</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Characteristics of the targeted EBP</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>Yes</td>
<td>Request that databases be accessible, provide paid time for research</td>
</tr>
<tr>
<td>Culture</td>
<td>No</td>
<td>Nurse managers will implement a hospital wide training with dedicated individual instruction on CAM assessment by nurse champion and mandatory online training</td>
</tr>
<tr>
<td>Evaluation capabilities</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Receptivity</td>
<td>No</td>
<td>Incorporate CAM and protocols into electronic medical records</td>
</tr>
<tr>
<td><strong>Facilitation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role of facilitator</td>
<td>No</td>
<td>Incorporate nurse champion into charge role</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dedicated time for facilitators using grant funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incorporate research hours into every nurse schedule to spend on research or contribute to ongoing projects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Each unit assigned staff nurse research coordinator as liaison between system’s research department and Unit Based Counsels</td>
</tr>
<tr>
<td>Other implementation interventions</td>
<td>No</td>
<td>Adequate cueing through EMR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feedback from staff - structured interviews</td>
</tr>
<tr>
<td><strong>Successful implementation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation plan realization</td>
<td>No</td>
<td>See above strategies for CAM and protocols</td>
</tr>
<tr>
<td>EBP uptake</td>
<td>No</td>
<td>Submit manuscript for publication, participate in training at local nursing programs</td>
</tr>
<tr>
<td>Patient and organizational outcomes</td>
<td>No</td>
<td>Task force to network nationally and investigate delirium certification</td>
</tr>
</tbody>
</table>