2024

Implementation of an Education Intervention Aimed at Intensive Care Unit Providers to Improve Knowledge of and Screening for Cognitive Impairment Related to Post-Intensive Care Syndrome

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Implementation of an Education Intervention Aimed at Intensive Care Unit Providers to Improve Knowledge of and Screening for Cognitive Impairment Related to Post-Intensive Care Syndrome

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing Practice at the University of Kentucky

By

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Versailles, KY

2024

Abstract

Background: Post intensive care syndrome is a condition that can lead to a range of physical, cognitive, and psychiatric issues and is frequently undiagnosed. Educating Nurse Practitioners, Physician Assistants, and Physician Fellows who work in the ICU about post intensive care syndrome and a cognitive screening tool like the MoCA can significantly enhance their understanding and ability to diagnose a component of this syndrome.

Purpose: The purpose of this project was to evaluate the effect of an educational intervention regarding post intensive care syndrome among ICU nurse practitioners, physician assistants, and physician fellows treating patients within the ICU.

Methodology: The project employed a quasi-experimental one-group pre-test and post-test design. The pre-test (Appendix A) and post-test (Appendix B) evaluated healthcare providers' knowledge of post intensive care syndrome, and providers' knowledge of and likelihood of using of the MoCA before and after a 20-minute educational module. The project also measured the rate of MoCA screenings completed by providers four weeks before and four weeks after the educational module.

Results: Post intensive care syndrome mean knowledge scores increased from 5.1 (SD=0.7) to 7.2 (SD=0.9), and MoCA mean knowledge scores increased from 3.6 (SD=1.3) to 6.4 (SD=1.6). The likelihood of implementing the MoCA into practice increased from 3.2 (SD=0.9) to 3.9 (SD=0.7). There was no change in MoCA screening rates from pre-intervention to post-intervention.

Conclusions: The educational intervention was effective in improving providers knowledge regarding post intensive care syndrome and MoCA scoring. Despite the change in attitudes to adopting the MoCA for cognitive screenings in the ICU, there was no change in screening rates.

Acknowledgments

I extend my heartfelt gratitude to my committee members—Dr. Andrew Makowski, Dr. Julie Perry, Dr. Brooke Judd, and Melissa Soper. I am especially grateful to Dr. Andrew Makowski for his unwavering support and tireless dedication to ensuring the success of this project. Additionally, I express my appreciation to Melissa Soper, who selflessly volunteered her extensive experience and clinical expertise in caring for patients with post intensive care syndrome. I would also like to acknowledge Dr. Amanda Thaxton-Wiggins for her invaluable assistance in statistical analysis.

I am grateful to Dr. Erin Camac for her unwavering support and for enabling me to invite Critical Care Fellows to participate in this project. Additionally, I want to thank Corinne Hook for her support and for allowing the Advance Practice Providers to participate in the project.

Lastly, I would like to acknowledge my classmate, Oliva Sasdi, for being a constant source of support throughout the program.

Dedication

I want to dedicate this DNP project to my Lord and Savior, Jesus Christ. Without him, none of this would be possible. I also want to dedicate this project to my loving wife, Gretchen Harrod. She has stood beside me, encouraged me, and unconditionally loved me through this crazy journey. To my children Emma and Savannah Harrod, you can accomplish anything you set your mind to as long as you pray continuously and never stop moving forward despite the obstacles you face.

I love you all and look forward to the next chapter of our lives together.

Table of Contents

Background and Significance

Problem Statement

As critical care medicine has evolved through the years, survival rates in the intensive care unit (ICU) have improved (Yende et al., 2016). Despite these rate improvements, there are patients that remain with impairments in physical, cognitive and mental functioning after leaving the ICU (Inoue et al., 2019). This complex syndrome that persistently affects psychological, cognitive, and physical health domains is referred to as post-intensive care syndrome (PICS), and it requires a multidisciplinary approach to treatment (Erin et al., 2021). PICS syndrome often goes undiagnosed, and many patients do not receive the treatment they need (Colbenson et al., 2019). Treatment should begin as soon as possible for this patient population, ideally before discharge (Ramnarain et al., 2021). For patients to be appropriately treated, providers within ICU settings must be aware of the syndrome and able to appropriately identify the early risk factors.

Context, Scope, and Consequence of the Problem

The Society of Critical Care Medicine recognized PICS as a syndrome in 2010, which can affect up to 70% of post-critical care patients (Erin et al., 2021; Myers et al., 2016). The exact incidence of PICS is unknown due to the lack of a specific diagnostic tool, and many of these patients are seen in primary care clinics after discharge, where primary care providers tend to have a low awareness of the disorder (Mikkelsen et al., 2020; Myers et al., 2016). Depending on the reason for admission to the ICU, estimates of PICS range from 43% to 64% (Geense et al., 2021). Patients with an admission to a medical ICU have about a 50% chance of developing PICS, with around 61% of those who were mechanically ventilated suffering from PICS for approximately 6 months after being extubated (Geense et al., 2021; Kawakami et al., 2021).

As many as 80% of patients who were admitted to the ICU could suffer from cognitive decline (Myers et al., 2016). Of the patients developing new psychiatric conditions, 84.3% of them suffered from anxiety, while 79.6% suffered from depression (Shdaifat & Al Qadire, 2022). Patients who suffer from mild cognitive decline are more likely to present with depression or anxiety (Ma, 2020). Several risk factors for cognitive decline have been identified including: gender (with females being at higher risk), older age, prolonged ICU length of stay, negative ICU experiences, and having delirium at some point during their admission (Lee et al., 2020).

Patients with newly acquired depression from an ICU admission, along with other psychiatric disorders associated with PICS, score significantly lower on the health-related quality of life questionnaire (HRQOL) (Davydow et al., 2009; Ramnarain et al., 2021). The patients with lower HRQOL scores were at a greater risk for suicide and were unlikely to make a timely return to work (Davydow et al., 2009). Fernando et al. (2021), found that ICU survivor suicide deaths doubled those without an ICU admission. About 60% of the patients who survive an ICU admission do not return to work at the time of their three-month follow-up, leading to a decrease in family income and increased usage of healthcare services, furthering the financial burden (Kamdar et al., 2020; Mattioni et al., 2022). The likelihood of being readmitted to the hospital three years after discharge from the ICU is significantly higher than patients without ICU admission (Kang & Lee, 2024). With higher readmission rates and new comorbidities, patients and hospitals are exposed to a more significant financial burden (Kang & Lee, 2024). With the underdiagnosis of PICS continuing to be a problem, this patient population will continue to see high rates of morbidity due to inadequate care.

Evidence-Based Intervention

The Society of Critical Care Medicine does not currently recommend a comprehensive, validated instrument for identifying PICS (Mikkelsen et al., 2020). Instead, it offers recommendations on a variety of tools that test for impairment in each domain of PICS (Mikkelsen et al., 2020). The Society of Critical Care Medicine recommends screening for impairments before, during and after critical illness, and specifically recommends screening for impairments in cognition during critical illness (Mikkelsen et al., 2020). While tests such as the modified mini-mental status examination and Mini-Cog are frequently used to test cognitive impairments, the Society of Critical Care Medicine recommends using the Montreal Cognitive Assessment (MoCA) when screening for PICS (Mikkelsen et al., 2020). The MoCA is a 30-question test that takes approximately ten minutes to administer and measures the six domains of cognitive functioning (Erin et al., 2021; Maust et al., 2012). The MoCA is more sensitive in recognizing mild cognitive impairment (MCI) than other cognitive screening tools like the Mini-Mental State Impairment Exam, with sensitivity scores of 97% and 58%, respectively(Luis et al., 2009).

The MoCA uses a series of questions and tasks to assess the patient's cognitive functioning. The MoCA has 30 possible points, with total scores less than 26 being the threshold for MCI (Erin et al., 2021). Visuospatial and executive functions are assessed by copying a cube (1 point), drawing a clock (3 points), and connecting numbers and letters (1 point). Verbal fluency is assessed through the naming of animals (3 points). Attention is measured through three separate tasks that involve repeating number sequences (2 points), basic math (3 points), and a task that requires sustained attention (1 point). Language is further assessed through repeating phrases and identifying words that begin in F (3 points). Abstraction is measured by identifying similarities

(2 points). Delayed recall is measured by a series of five words that must be repeated without cues (5 points). Lastly, orientation is evaluated by asking the patient six orientation questions (6 points) (Nasreddine, 2023).

Purpose/Objectives

The purpose of this DNP project was to provide an educational intervention regarding PICS to ICU nurse practitioners, physician assistants, and physician fellows treating patients within the ICU. The specific aims were to 1.) evaluate the change in provider knowledge of PICS and the MoCA screening tool before and after the educational intervention, 2.) Evaluate the changes in screening rates for cognitive decline via the MoCA before and after the educational intervention, and 3). examine the nurse practitioners', physician assistants', and physician fellows' intent to use the MoCA in their future practice.

Review of Literature

The PICOT question that guided the review of the literature was: Among healthcare providers treating ICU patients, how does an education intervention regarding PICS affect knowledge and use of the MoCA?

Search Strategies

To explore the impact of educational interventions on healthcare providers' knowledge and use of the Montreal Cognitive Assessment (MoCA) in treating ICU patients, a literature search was conducted using CINAHL and PubMed databases. Specific search terms included "Montreal Cognitive Assessment" or "MOCA" and "Post-ICU syndrome" or "PICS" were combined with "in-hospital cognitive assessments," "cognitive assessment after a stroke," "ICU cognitive assessment," "early cognitive assessment," or "very early cognitive assessment," using Boolean operators, leading to 684 articles. Additionally, a second search was conducted using

the terms "education barriers" or "evidence-based practice barriers," "education workshops," and "increasing providers' knowledge," resulting in 192 articles. Following the application of rigorous selection criteria, which included evaluating peer-reviewed articles, ensuring full-text availability, and limiting publication dates to between 2005-2023, a total of 16 articles were included.

Synthesis of Evidence

There are several tools to aid in identifying PICS. Several studies have concluded that the MoCA is significantly more sensitive than other screening tools in detecting MCI (Luis et al., 2009; Maust et al., 2012; Mikkelsen et al., 2020). This is one reason why the SCCM recommends the MoCA for detecting MCI in patients admitted to the ICU (Mikkelsen et al., 2020). Additionally, the MoCA can be executed in as little as 10 minutes in a clinical setting, making it a valuable tool for practitioners to identify patients who are at risk of developing MCI (Maust et al., 2012; Nasreddine et al., 2005).

Implementing evidence-based practices in healthcare settings is often faced with several barriers (Hasanpoor et al., 2019; Whitehorn et al., 2021). These barriers include a lack of time, provider belief that changes in practice will have minimal impact on care, and inadequate training systems (Alqahtani et al., 2022; Clarke et al., 2021; Hasanpoor et al., 2019; Paci et al., 2021). Furthermore, inadequate communication between researchers and healthcare providers can lead to limited access to current evidence, resulting in a lack of knowledge (Hasanpoor et al., 2019; Tacia et al., 2015).

To address these challenges, healthcare organizations can implement training and workshop programs that improve providers' knowledge and change their attitudes toward specific patient populations (Hamilton et al., 2022; Lim et al., 2012). The information delivered in the training

workshops can be computer-based, delivered asynchronously while still maintaining the intended effect of improving provider knowledge (Hart et al., 2008; Mohamed et al., 2024). Through the implementation of a web-based educational intervention, researchers observed a significant improvement in the knowledge and attitudes of the participants (Hart et al., 2008; Mohamed et al., 2024).

Gap in Evidence

Provider knowledge continues to be a common barrier that affects the implementation of evidence-based practice (Whitehorn et al., 2021). Education programs are vital to increasing healthcare members' awareness of the new EBP available (Elaine et al., 2019). Providers must have adequate time, and easy access to the education implementations, that are structured in a way that is practical to the clinician's day-to-day activities (Elaine et al., 2019; Hamilton et al., 2022).

Theoretical Framework

The theoretical framework that guided this DNP project was the Framework for Knowledge Transfer (Lavis et al., 2003). Using five questions, the framework guides educators to effectively communicate knowledge to the appropriate audience. The questions include: "1). What should be transferred to decision-makers? 2). To whom should research knowledge be transferred? 3). By whom should research knowledge be transferred? 4). How should research knowledge be transferred? 5). With what effect should research knowledge be transferred?" (Lavis et al., 2003). The authors recommend that messages be relayed and supported by multiple pieces of evidence rather than a singular piece of evidence (Lavis et al., 2003).

For this DNP project, the message to be disseminated is the definition, clinical manifestation, and prevalence of PICS and how to use the MoCA in cognitive screenings for

early identification of PICS risk factors. The target audience is the critical care providers in the Medicine/Pulmonary ICU, with the principal investigator being the messenger. The knowledge was transferred via an education module, and the evaluation was through pre-/post-surveys and chart reviews.

Methods

Design

This DNP project used a quasi-experimental one-group pretest-posttest design. Healthcare providers' knowledge of PICS and the MoCA were assessed before and immediately after providers engaged in an educational module. The number of MoCA screenings completed in the ICU before and after the educational module was also reviewed.

Setting

Agency

UK HealthCare is a level-one Trauma Center located in Lexington, Kentucky. It has 569 inpatient beds, making it the second-largest teaching hospital in the state. The hospital also has 100 intensive care beds for various specialties (UK Healthcare, n.d.-a). The intervention was implemented in the medicine pulmonary service line, which comprises 24 nurse practitioners, 1 physician assistant, and 20 physician fellows who provide care to 44 ICU beds.

Project Congruence to the Agency's Mission

This DNP project focused on provider education regarding PICS and appropriately using the MoCA to detect early cognitive decline among ICU patients. It contributed to UK HealthCare's strategic plan, which focuses on creating one community committed to creating a healthier Kentucky (UK Healthcare, n.d.-b).

Facilitators and Barriers to Implementation

Buy-in from the chief of the internal medicine pulmonary critical care fellowship program, the chief physician fellows, and the supervisor for the advanced practice providers was necessary for implementing this project with nurse practitioners, physician assistants, and physician fellows. A presumed barrier to implementing this educational intervention was the time commitment required of participants, estimated to be 30 minutes. However, this barrier was mitigated by offering participants the flexibility to complete the intervention at their convenience. This approach helped minimize the impact of the time constraint and enabled more participants to engage with the educational content.

Sample

The target population for this DNP project was nurse practitioners, physician assistants, and physician fellows with the pulmonary critical care medicine service line. The inclusion criteria to participate included providers who had practicing privileges within the UK Healthcare system and provided patient care in the medicine/pulmonary critical care setting. Exclusion criteria included staff in administrative roles that do not provide direct patient care.

Procedure

IRB Approval

Approval was obtained from the Nursing Research Council and the Institutional Review Board (IRB) at the University of Kentucky prior to implementing this DNP project.

Description of Intervention

After IRB approval, an email was sent to the nurse practitioners, physician assistants, and physician fellows employed in the Medicine/Pulmonary ICU at UK Healthcare, inviting them to participate in the DNP project. The email included a cover letter (Appendix A) with information

about the project, a link to the pretest survey (Appendix B), a link to the pre-recorded 20-minute educational module, and a link to the posttest survey (Appendix C). The educational module consisted of a voice-over PowerPoint presentation that provided education on

- The definition of PICS
- The effects of PICS and how it impacts patients' physical, cognitive, and psychological aspects.
- How to administer and score the MoCA in the ICU setting
- Where to properly document the scored MoCA.

A deidentified random chart audit of n=40 was conducted to assess the screening rates using the MoCA in the Medicine/Pulmonary ICU at UK Healthcare one month prior and one month post the prerecorded 20-minute educational module to evaluate changes in MoCA screening rates.

Measures and Instruments

The pretest survey was administered via Qualtrics, with each participant creating a unique identifier. Demographic information including profession, gender, education level, age, and years of experience was collected. The pretest survey included an eighteen-item knowledge-based questionnaire that was created by the PI and was based on evidence from current literature. Face validity was established by having expert psychiatric mental health nurse practitioners and an expert adult gerontology acute care nurse practitioner review and edit the questionnaire. The questionnaire had eight questions that collected data on the provider’s knowledge of PICS and ten questions regarding administration and scoring of the MoCA. The unique identifier allowed data from the pre-intervention survey to be linked with the post-intervention survey so statistical

analysis could be conducted to measure changes in learning. The post-survey had the identical knowledge-based questions to the pre-intervention survey and was also administered via Qualtrics.

A random chart audit of 80 entries was conducted after the intervention period. Forty charts were selected from before the educational intervention to establish the baseline screening rate for cognitive decline in the Medicine/Pulmonary ICU, while the remaining 40 charts were from one month after the education module to determine the post-education screening rate for cognitive decline. Data collection for the utilization of the MoCA was collected from the electronic medical record using the Center for Clinical and Translational Science Services (CCTS).

Lastly, both the pre-and post-intervention- surveys contained one question asking the providers to use a Likert scale to rate the likelihood of implementing the MoCA into their practice. All data was stored on a firewall-protected computer linked to the UK server.

Data Analysis

The collected data underwent statistical analysis using IBM SPSS software, version 29. Descriptive statistics, utilizing frequency distributions, were employed to determine the participants' clinical characteristics. Additionally, a paired sample t-test was conducted to measure the change in knowledge between pre-and post-intervention surveys, with statistical significance determined by a p-value of less than 0.05.

Results

Twenty-four nurse practitioners, 1 physician assistant, and twenty pulmonary critical care fellows were invited to participate, which led to ten participants completing the study. Among the participants, 80% (see Table 1) were nurse practitioners, and 20% were physician fellows.

Seventy percent of participants identified as woman and 30% identified as man. Those holding a doctoral degree represented 70% of the participants, with the other 30% holding a master's degree. All participants fell within the age range of 30-39 and had an average of 2.80 years of experience.

There was a statistically significant increase in mean knowledge scores of PICS among participants post-intervention compared to pre-intervention (see Table 2). With a range of 0-8, the mean pre-survey score of knowledge about PICS among participants was 5.1 (SD= 0.7), and the post-survey mean was 7.2 (SD= 0.9), with a *p-value* of <.001. There was also a statistically significant increase in mean knowledge score on the use and scoring of the MoCA among participants post-intervention compared to pre-intervention. With a range of 0-10, the mean pre-survey knowledge score on the use and scoring of the MoCA was 3.6 (SD= 1.3), and the post-survey mean was 6.4 (SD= 1.6), with a *p-value* <.001.

The likelihood of implementing the MoCA into practice, with a score range of 1-5, had a pre-survey mean of 3.2 (SD= 0.9) and a post-survey mean of 3.9 (SD= 0.7) with a *p-value* of 0.025. Half of the providers felt neutral about implementing the MoCA into practice prior to the education intervention. Post-intervention, 50% of participants did not show any change in their attitude toward implementation. Thirty percent of participants increased their attitude by one point, with the average being 3.33 on the pre-intervention survey and 4.3 on the post-intervention survey, and two participants increased their score from 2 to 4 on the pre/post-intervention survey. These results represent a positive shift in providers' attitudes toward using MoCA in their practice.

CCTS was utilized to obtain de-identified chart data to include MoCA screenings for the month preceding and the month following the educational intervention. Of the 384 patient charts

that were available during the implementation phase of the project, 40 pre- and 40 post-intervention charts were randomly selected for review. The chart audit found that no MoCA screenings were conducted in the ICU during pre- or post-intervention. While there was a significant alteration in survey attitudes towards MoCA implementation post-intervention ($p < .025$), the screening rates for CI in the ICU using the MoCA remained unchanged.

Discussion

The purpose of this DNP project was to provide an educational intervention regarding PICS and how to screen for MCI using the MoCA to ICU nurse practitioners, physician assistants, and physician fellows treating patients within the ICU. Whitehorn et al. (2021) state provider knowledge is a common barrier to implementing new evidence-based practice. Research has demonstrated that educational interventions play a crucial role in facilitating the transfer of evidence-based interventions from researchers to practitioners (Elaine et al., 2019). As part of this DNP project, a series of surveys were conducted to evaluate the change in knowledge healthcare providers had about PICS and the MoCA tool before and after an educational intervention, which showed a statistically significant increase in knowledge regarding PICS and the MoCA screening tool.

Researchers have found multiple barriers to adopting new evidence-based practices, including attitudes toward specific patient populations (Lim et al., 2012). However, despite a statistically significant increase in the providers' likelihood of MoCA use from pre-intervention to post-intervention surveys, screening rates using the MoCA in the ICU did not change. These results likely highlight how attitudes can hinder the implementation of new evidence-based practices. For this DNP project, specific attitudes toward adopting EBP were not evaluated. Utilizing the Evidence-Based Practice Attitude Scale in the future would be beneficial in

developing more effective training programs that take provider attitudes into account (Lim et al., 2012). One solution to overcome the negative attitudes of providers is to increase exposure to EBP training that focuses more on techniques that have been shown to have a positive impact on attitudes, making providers more open to adopting new practices (Lim et al., 2012).

The implementation of the DNP project had a noteworthy impact on healthcare providers' comprehension of post intensive syndrome and the proper utilization of the MoCA. This educational intervention led to a significant improvement in knowledge regarding PICS and how to perform cognitive screenings using the MoCA. While the survey results indicated that providers were more inclined to use the MoCA for screenings, there was no conclusive evidence to support the increase in usage. It is possible that having an electronic version of the MoCA in the electronic medical records may improve utilization by eliminating the added step of having to scan the MoCA into the chart. This is noteworthy because the MoCA is a cognitive screening tool endorsed by the SCCM for early detection of cognitive impairment, with research validating its efficacy. To ensure long-term effectiveness, it is imperative to incorporate this educational module into the yearly competency web-based training program as a refresher course.

Implications

This DNP Project demonstrated that an educational module on PICS and the MoCA for cognitive screenings did improve provider’s knowledge and changed attitudes towards routine use of MoCA screenings in the ICU. Educational modules using YouTube, and PowerPoint Presentations allow providers to easily access new educational materials on their own time, and in any location. Providers are not limited by barriers associated with in-person training sessions, such as strict attendance times, needing a facility large enough to conduct the training in, and scheduling other staff for coverage of a provider that is out due to attending an in-person session.

Eliminating such barriers and requiring fewer resources makes web-based training more cost-effective than in-person training.

There is sufficient evidence to support the adoption of cognitive impairment screenings in the ICU using the MoCA. With the support of evidence, a guideline could be implemented to have providers assess a patient using a MoCA before ICU discharge. The timely detection of MCI is a crucial step towards improving patient outcomes since MCI is known to negatively impact the quality of life of those who acquire it. It is possible that earlier detection leads to earlier outpatient referrals and ensures the highest quality of care in the ICU.

Although post intensive care syndrome is a condition that develops in ICU survivors, it is advantageous for all caregivers who are responsible for such patients to have a fundamental understanding of PICS and its identification. Future research endeavors should focus on assessing the impact of educational sessions on PICS, including how it enhances outpatient providers' knowledge, diagnostic abilities, and awareness of resources available to patients with PICS. Another area warranting future research is developing an efficient process for referring patients identified through early screenings who are suffering from early MCI due to PICS to a post-ICU clinic for further treatment.

Limitations

Limitations to the DNP project included time, sample size, and setting. The setting was a limitation of this project because it only took place in one ICU and within one hospital. This limited the project to one specialized group of providers and one specialized group of patients. The setting of the intervention has a high rate of patient turnover due to the high level of acuity, with some of them never achieving a state of health where an effective screening could be completed. To gain more insight into the effectiveness of the PICS educational material

provided, it should be implemented in multiple settings with various critical care specialties participating.

Time was a significant limitation to this DNP project as well. This DNP project was able to keep the educational material open for two months. Due to the time limitation, some providers may not have had enough time to participate in the study. Time was also a limitation for chart auditing due to only being able to look at the chart one-month post-intervention. With the providers' having varying work schedules, some participants may have been off service during that month.

Another limitation of this DNP project was the sample size. Initially, 55 providers were invited to participate in the study; 15 of them began the study, but only 10 completed it. Factors that could have contributed to the small sample size include the voluntary basis of the project, training being done on personal time, and the high workload volume associated with the participants' professions. The low sample size limited the ability to determine the true effectiveness of the educational intervention.

Conclusion

An educational intervention provided to ICU healthcare providers resulted in increased healthcare providers' knowledge of PICS and the use of MoCA screenings. The results also indicated a significant increase in the likelihood of using MoCA screening. Further research should provide better insight into the likelihood of implementing MoCA screenings into future practice.

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Tables

Table 1. Participant Clinical Characteristics (N=10)

CHARACTERISTIC	*MEAN* (SD) OR *N* (%)
POSITION AT UK	
FELLOW	2 (20.0%)
NURSE PRACTITIONER	8 (80.0%)
GENDER	
MAN	3 (30.0%)
WOMAN	7 (70.0%)
HIGHEST DEGREE EARNED	
MASTER'S	3 (30.0%)
DOCTORAL	7 (70.0%)
CURRENT AGE	
30-39	10 (100.0%)
YEARS OF EXPERIENCE	2.80 (1.53)

Table 2. Pre/Post Survey (n=10)

Knowledge Domain	*Potential range*	*Pre-survey mean (SD)*	*Post-survey mean (SD)*	*p*
Post-ICU Syndrome Knowledge	0-8	5.1 (0.7)	7.2 (0.9)	<.001
MoCA Scoring	0-10	3.6 (1.3)	6.4 (1.6)	<.001
Likelihood of Implementing MoCA into Practice	1-5	3.2 (0.9)	3.9 (0.7)	.025

Appendices

Appendix A: Cover letter

Implementation of an Education Intervention Aimed at Intensive Care Unit Providers to Improve Knowledge of and Screening for Cognitive Impairment related to Post-Intensive Care Syndrome

To MICU APRNs, PAs, and Physician Fellows:

I, Terry Harrod, am contacting you from the University of Kentucky College of Nursing to request participation in a survey and education program as a requirement for graduation. The research proposal is titled "The Effect of Post-Intensive Care Syndrome Education on Provider Knowledge in Developments and Implementation of a Screening Protocol to Improve Early Detection of Cognitive Decline in ICU Patients." It seeks to investigate an educational module's impact on a provider's knowledge regarding Post-Intensive Care Syndrome and the use of the Montreal Cognitive Assessment.

Although you may not get personal benefit from taking part in this research study, your responses may help us understand more about the effects of education on identifying cognitive impairment in Medicine ICU patients. Some volunteers experience satisfaction from knowing they have contributed to research that may benefit others in the future.

I will review and collect information from your survey responses. After the pre- and post-survey, I will perform a retrospective chart analysis of patient records to determine whether cognitive screenings are different from pre-/post education. If you do not want to be in the study, there are no other choices except not to take part in the study.

Your participation in this study will last about 30-60 minutes. This time will be split between the pre-/post-survey, estimated 10 minutes, and the educational intervention, estimated 20-30 minutes to complete. Your response to the survey is anonymous, meaning no names, IP addresses, email addresses, or any other identifiable information will be collected with the survey responses. We will not know which responses are yours if you choose to participate.

There are no known risks to participating in this study. We hope to receive completed questionnaires from about 20 people, so your answers are important to us. Of course, you have a choice about whether or not to complete the survey/questionnaire, but if you do participate, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey.

Please be aware that while we make every effort to safeguard your data once received from the online survey company, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still on the survey company's servers, or while en route to either them or us. It is also possible that the raw data collected for research purposes will be used for marketing or reporting purposes by the survey/data gathering company after the research is concluded, depending on the company's Terms of Service and Privacy policies.

If you have questions about the study, please feel free to ask; my contact information is given below.

Thank you in advance for your assistance with this important project. To ensure your responses/opinions will be included, please submit your completed survey within 14 days of receipt.

Sincerely,

Terry Neal Harrod Jr.
College of Nursing, University of Kentucky
PHONE: 859-967-9845
E-MAIL: Tnharr1@uky.edu

Faculty Advisor: Andrew Makowski, DNP, APRN, PMHNP-BC
E-MAIL: ama235@uky.edu

If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the University of Kentucky Office of Research Integrity staff at 859-257-9428 or toll-free at 1-866-400-9428.

Appendix B: Pre-Survey

Pre-Survey

Informed Consent: Your participation in this study will last about 30-60 minutes. This time will be split between the pre-/post-survey, estimated 10 minutes, and the educational intervention, estimated at 15-20 minutes to complete. Your response to the survey is anonymous, meaning no names, IP addresses, email addresses, or any other identifying information will be collected with the survey responses. We will not know which responses are yours if you choose to participate. There are no known risks to participating in this study. Of course, you have a choice about whether or not to complete the survey, but if you do participate, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. Please be aware while we make every effort to safeguard your data once received from the online survey company, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still on the survey company's servers, or while en route to either them or us. It is also possible the raw data collected for research purposes will be used for marketing or reporting purposes by the survey/data gathering company after the research is concluded, depending on the company's Terms of Service and Privacy policies. By checking the "I Agree" box below, you are consenting to participate in this study.

I agree to participate (4)
I refuse to participate (5)

Participant ID

Enter a five-digit number that you will remember. This is the pin that you will use to complete the following survey and the post-survey.

Example: 09458

1. What is your current position at UKHealthcare?
    - o Fellow
    - o Physician Assistant
    - o Nurse Practitioner
2. What is your gender identity?
    - o Man
    - o Woman
    - o Not Listed
    - o Prefer not to reply
3. What is your highest degree earned?
    - o Bachelor's
    - o Master's
    - o Doctoral
4. How many years of experience do you have in your current role?
5. What is your current age?
    - o 18-29
    - o 30-39

- 40-49
- 50-59
- 60+

6. When did the Society of Critical Care Medicine recognize complications Post-ICU as a syndrome?
    - 2011
    - 2010
    - 2009
    - 2012
7. Post-Intensive Care Syndrome affects the patient's psychological, cognitive, and physical domains.
    - True
    - False
8. Based on a 2023 study, when should patients begin to be assessed for complications of being treated in the ICU?
    - 3 months after discharge from hospital
    - Before discharge from the ICU
    - 2 weeks after ICU discharge
    - Anytime before discharge from the hospital
9. It is best to have a multidisciplinary approach when treating a patient with suspected Post-Intensive Care Syndrome.
    - True
    - False
10. Up to _____% of patients who are put on the ventilator are at risk for developing Post-Intensive Care Syndrome.
    - 50%
    - 42%
    - 61%
    - 73%
11. Patients who have been identified as having mild cognitive impairment are at significant risk for readmission to the ICU.
    - True
    - False
12. Some estimates are as high as _____ of those patients with mild cognitive impairment will not be able to return to their previous level of functioning in relation to their work.
    - 45%
    - 73%
    - 60%
    - 52%
13. Effective screening for cognitive decline can be done in as little as?
    - 10 minutes
    - 5 minutes
    - 15 minutes
    - 20 minutes
14. How many points are possible for the Visuospatial/Executive portion of the MoCA?
    - 3

- 4
- 5

15. At what score does the MoCA begin to suggest that a patient may have some mild cognitive impairment?
    - Scores below 25
    - Scores below 26
    - Scores below 27
    - Scores below 28
16. Which domains does the naming portion of the MoCA examine? Select all that apply.
    - Delayed Recall
    - Language
    - Perceptual Visual Function
    - Attention
    - Concentration
17. While administering the MoCA, how many times can the examiner repeat the instructions to the participant?
    - As many as needed
    - Two times
    - One time
    - Three times
18. During the serial of seven portion of the MoCA, can the participant use their fingers or a sheet of paper?
    - No
    - Yes
19. When scoring the MoCA, how many points do you add to a participant's score if they have 12 years or less of education?
    - 2 points
    - 1 point
    - 3 points
    - 4 points
20. What is the maximum score a participant can get on the MoCA?
    - 29
    - 28
    - 30
    - 32
21. While administering the MoCA, how many times can you ask a participant to repeat the numbers under the digit span section?
    - 1
    - 0
    - 2
    - 3
22. While administering the verbal fluency section of the MoCA, how long do you time a participant when having them think of words that begin with F?
    - 30 seconds
    - 60 seconds
    - 40 seconds

- 20 seconds

23. While administering the abstraction section of the MoCA, how many chances does the participant get in between instructions?
    - 1
    - 2
    - 3
    - 4
24. On a scale of 1-5, how likely are you to utilize the MoCA in your practice?
    - Extremely unlikely
    - Unlikely
    - Neutral
    - Likely
    - Extremely likely

Appendix C: Post-Survey

Post-Survey
Participant ID

Enter a five-digit number that you will remember. This is the pin that you will use to complete the following survey and the post-survey.

Example: 09458

1. When did the Society of Critical Care Medicine recognize complications Post-ICU as a syndrome?
    - o 2011
    - o 2010
    - o 2009
    - o 2012
2. Post-Intensive Care Syndrome affects the patient's psychological, cognitive, and physical domains.
    a. True
    b. False
3. Based on a 2023 study, when should patients begin to be assessed for complications of being treated in the ICU?
    a. 3 months after discharge from hospital
    b. Before discharge from the ICU
    c. 2 weeks after ICU discharge
    d. Anytime before discharge from the hospital
4. It is best to have a multidisciplinary approach when treating a patient with suspected Post-Intensive Care Syndrome.
    a. True
    b. False
5. Up to _____% of patients who are put on the ventilator are at risk for developing Post-Intensive Care Syndrome.
    a. 50%
    b. 42%
    c. 61%
    d. 73%
6. Patients who have been identified as having mild cognitive impairment are at significant risk for readmission to the ICU.
    a. True
    b. False
7. Some estimates are as high as _____ of those patients with mild cognitive impairment will not be able to return to their previous level of functioning in relation to their work.
    a. 45%
    b. 73%
    c. 60%
    d. 52%
8. Effective screening for cognitive decline can be done in as little as?

a. 10 minutes
b. 5 minutes
c. 15 minutes
d. 20 minutes

9. How many points are possible for the Visuospatial/Executive portion of the MoCA?
    a. 3
    b. 4
    c. 5
10. At what score does the MoCA begin to suggest that a patient may have some mild cognitive impairment?
    a. Scores below 25
    b. Scores below 26
    c. Scores below 27
    d. Scores below 28
11. Which domains does the naming portion of the MoCA examine? Select all that apply.
    a. Delayed Recall
    b. Language
    c. Perceptual Visual Function
    d. Attention
    e. Concentration
12. While administering the MoCA, how many times can the examiner repeat the instructions to the participant?
    a. As many as needed
    b. Two times
    c. One time
    d. Three times
13. During the serial of seven portion of the MoCA, can the participant use their fingers or a sheet of paper?
    a. No
    b. Yes
14. When scoring the MoCA, how many points do you add to a participant's score if they have 12 years or less of education?
    a. 2 points
    b. 1 point
    c. 3 points
    d. 4 points
15. What is the maximum score a participant can get on the MoCA?
    a. 29
    b. 28
    c. 30
    d. 32
16. While administering the MoCA, how many times can you ask a participant to repeat the numbers under the digit span section?
    a. 1
    b. 0
    c. 2

d. 3

17. While administering the verbal fluency section of the MoCA, how long do you time a participant when having them think of words that begin with F?
    a. 30 seconds
    b. 60 seconds
    c. 40 seconds
    d. 20 seconds
18. While administering the abstraction section of the MoCA, how many chances does the participant get in between instructions?
    a. 1
    b. 2
    c. 3
    d. 4
19. On a scale of 1-5, how likely are you to utilize the MoCA in your practice?
    a. Extremely unlikely
    b. Unlikely
    c. Neutral
    d. Likely
    e. Extremely likely