Fall 2022

Quality Improvement for Patients with Alcohol Withdrawal Syndrome Starts with an Evaluation Tool

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QUALITY IMPROVEMENT FOR PATIENTS WITH ALCOHOL WITHDRAWAL SYNDROME STARTS WITH AN EVALUATION TOOL

by

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A Doctoral Project
Submitted to the Graduate School,
the College of Nursing and Health Professions
and the School of Leadership and Advanced Nursing Practice
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

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December 2022

Published by the Graduate School

ABSTRACT

Patients with alcohol withdrawal syndrome (AWS) have adverse outcomes to the traditional methods of assessing for and treating withdrawal within the intensive care unit (ICU), which includes a standardized treatment plan. Some negative outcomes include acquiring costly and dangerous hospital-acquired infections, safety concerns, and traumatic experiences that deter further treatment. More individualized assessments and treatments are needed to prevent or decrease the severity of AWS from occurring in critical care settings, which will facilitate more positive outcomes and experiences for the staff and patients. The Minnesota detoxification scale has been shown to be a more appropriate tool for the critical setting and will be the focus of this doctoral project. An educational module was developed for ICU nursing staff, including medical students and advanced practice nurses, on recognizing and treating patients who demonstrate signs and symptoms of AWS. The background of alcohol withdrawal syndrome was discussed to highlight the purpose of this project, which includes installing a training module for critical care staff and allowing time to implement the tool into practice. The module was based on AWS, a more appropriate screening tool for the critical care setting, and possible treatment options. This project's validity was determined through a pre-assessment and post-assessment of the module. This doctoral project included providing an individualized assessment of patients with documented alcohol disorders as the first step to preventing or deescalating the symptoms of AWS.

ACKNOWLEDGMENTS

I would like to thank my committee chair, Dr. Carolyn Coleman, for her support, patience, and reassurance throughout completing my doctoral project. I would also like to express my gratitude to Dr. Lakenya Forthner, who served as my committee member.

I would also like to thank Dr. Jennifer Trihoulis and Bill Thornton for ensuring my clinical experiences were immersive and meaningful. The knowledge they shared with me will be crucial as I adopt new roles and responsibilities in my career as an advanced practice nurse.

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DEDICATION

First, I would like to thank God for giving me the drive, patience, and endurance to complete this doctoral project. I want to dedicate this project to those who stood in my corner during this vast undertaking. To my mother, thank you for reminding me that sometimes a gentle touch or cool washcloth is the best medicine. To my sister and best friend, Jennifer, thank you for showing me all those years ago what it meant to be a compassionate nurse and for always being my biggest cheerleader. To my brothers, Jack and Patrick, for making me "hard-headed" enough to never give up. To my dad, thank you for always being the wind beneath my wings and I know you are smiling down on me from heaven.

To my children (Gunner and Aiden), I hope you learn from this experience that through hard work and dedication, there is nothing out of your reach. Lastly and most importantly, I commit this project to my husband, Shane. Thank you for always having more faith in me than I do in myself and encouraging me always to follow my dreams. Without you, I never would have the courage to pursue my aspirations. Thank you for your sacrifices for our family while I continued my education. Finally, thank you for leading by exampling in showing our sons what unconditional love and supports means.

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LIST OF ABBREVIATIONS

ACNP	Acute Care Nurse Practitioner
APACHE II	Acute Physiology and Chronic Health Enquiry
AUD	Alcohol Use Disorder
AUDIT	Alcohol Use Disorder Identification Test
AWS	Alcohol Withdrawal Syndrome
BZD	Benzodiazepine
CCNC	Critical Care Nurse Council
*CINAHA*L	Cumulative Index for Nursing and Allied Health Literature
CIWA-Ar	Clinical Institute Withdrawal Assessment for Alcohol-Revised
DSM-5	Diagnostic and Statistical Manual for Mental Disorders
DT	Delirium Tremens
FAST	Fast Alcohol Screening Test
GABA	Gamma Aminobutyric Acid
ICU	Intensive Care Unit
IRB	Institutional Review Board
IT	Information Technology
LOS	Length of Stay
MAR	Medication Administration Record
MINDS	Minnesota Detoxification Scale

PDSA	Plan, Do, Study, Act model
SHOT	Sweating, Hallucinations, Orientation, and Tremors scale
USA	United States of America
USM	The University of Southern Mississippi
VAP	Ventilator Associated Pneumonia
YAWP	Yale Alcohol Withdrawal Protocol
WCU	William Carey University

CHAPTER I – INTRODUCTION

The high number of patients with alcohol use disorder (AUD) seen within the general hospital setting has led to an alarming rate of patients being transferred to the intensive care unit (ICU). ICU admissions related to alcohol withdrawal syndrome led to an increase in the patient's length of stay, mortality, and morbidity due to the severe and deadly effects of alcohol withdrawal syndrome (AWS). To give some insight into the prevalence of alcohol use disorder among adults between the ages of 20 and 64, 1 in 10 deaths can be attributed to excessive alcohol use (US Preventive Services Task Force et al., 2018). Some patients with AWS have adverse outcomes to the traditional methods of assessing for and treating withdrawal within the ICU, including acquiring costly and dangerous hospital-acquired infections, safety concerns, and traumatic experiences that prevent further treatment. In addition, post-trauma associated with being placed in physical restraints and on mechanical ventilators has been reported in the literature. Early detection of withdrawal from alcohol and enhancement of staff awareness can help prevent or limit the complications/consequences associated with the prolonged cessation of alcohol. An educational training module was developed for ICU nursing staff on recognizing and treating patients who demonstrate signs and symptoms of AWS. The goal of the training module was to highlight the prevalence of alcohol use disorders within the hospital setting, the dangers of delayed treatment, and establish an assessment system that is more appropriate for the acute care setting. Providing an individualized assessment of patients with documented alcohol disorders is the first step to preventing or decreasing the severity of AWS.

Research has shown that up to 42% of patients admitted into the hospital have alcohol use disorder, and one-third of those patients are accounted for in the ICU. Of the population of patients with AUD, approximately 8 % will experience alcohol withdrawal syndrome (AWS) (Jesse et al., 2016). Symptoms of withdrawal can range from headaches, tremors, sweating, hallucinations, nausea, and vomiting to seizures. When AWS is allowed to progress to the more severe stages, such as seizures or delirium tremors, the average length of stay is more than doubled.

Background

The dangers of an alcohol withdrawal syndrome that is left untreated can be life-threatening. Early signs of withdrawal can present within 24 hours of the last consumption. The early warning signs are tremors, irritability, anxiety, agitation, nausea, and vomiting (Yitayih et al., 2019). These symptoms result from an imbalance within the brain caused by chronic alcohol use. When there is a glutamate-mediated central nervous system innervation, it can lead to autonomic over-activation. And this over-activation is when neuropsychiatric complications, like delirium and seizures, are seen. Life-threatening complications such as altered mental status, global confusion, arrhythmias, aspiration pneumonia, respiratory failure, hypertension, hyperthermia, seizures, and delirium tremens can happen when delayed or missed treatment (Yitayih et al., 2019). These complications can only be exemplified when compounded with other critical conditions.

Delirium Tremens (DT) is what comes to the minds of most when they think of alcohol withdrawal syndrome. DT is the most dangerous withdrawal effect but depends on two different features. The first feature is severe withdrawal, and the second feature is

delirium. Alcohol withdrawal has progressed to the severe stage when hallucinations, seizures, and disturbing tremors can be seen. The characteristics of delirium are instability in the level of consciousness, cognition, psychomotor activity, and sleep-wake cycle (Grover & Ghosh, 2018). Delirium does not necessarily have to cause by the AWS, but the combination of the two places patients in a life-threatening situation. Critical care nurses and acute care nurse practitioners (ACNPs) must remember to investigate all possible reasons for delirium, such as sepsis, electrolyte imbalances, and metabolic dysfunction. Delirium tremens carry a mortality rate of 37% without management (Yitayih et al., 2019).

The Rational for the Doctoral Project

More than forty percent of patients admitted into hospitals each year meet the criteria for alcohol use disorder, and thirty percent of those patients will be admitted into the intensive care unit for alcohol withdrawal (Jesse et al., 2016). The critical nature of those patients admitted into the ICU can further mask the underlying issue of alcohol dependence. The potential development of withdrawal symptoms due to sudden cessation of alcohol is often left unnoticed until severe and dangerous consequences occur. These consequences negatively impact the patient but also the staff.

Significance of the Doctoral Project

However apparent that the national need for adequate treatment is for substance abuse, not just alcohol abuse, the present health care system is neither adequately trained nor eager to accept and care for patients with substance abuse disorder. Few medical or nursing schools educate students on how to appropriately detect, prevent and treat disorders related to substance abuse. However, great studies authenticate high prevalence

rates among patients in general medical care settings, emergency departments, and hospitals (SAMHSA, 2016). In 2006, only eight percent of medical schools mandated a course on addiction medicine, and just 36 % offered an elective course (Institute of Medicine & Committee on Crossing the Quality Chasm [IOM], 2006). The ill-equipped medical provider is hindered further by shortages and undereducation in nursing and the declining number of Psychiatrists to use a collaborator. Research has shown that nurses lack comprehension of early recognition, thus delaying the treatment of delirium. A lack of knowledge or education is the major obstacle to meeting the needs of patients with delirium (Thomas et al., 2021).

Problem Description and PICOT

While there have been many advances in health care and medicine, hospital patients are sicker and require more diligence. Patients that suffer from alcohol abuse, or any other addictive substance, are in a very vulnerable situation when they are admitted to the hospital for any length of time. Some questionnaires are done with every hospital admission to help determine those at risk for AWS, such as the Alcohol Use Disorder Identification Test (AUDIT), the Fast Alcohol Screening Test (FAST), or the CAGE test, just to name a few. However, these tests depend on the patient's cooperation, comprehension, self-awareness, and honesty (Jesse et al., 2016). While the screening tools are somewhat beneficial, they are faulty because only subjective information is utilized. The negative stigma surrounding alcohol abuse deters most patients from being honest about their consumption. When other medical conditions may be masking the withdrawal or preventing the patient from communicating subjective signs, like mild agitation, cravings, or hallucinations, the validity of these screening tools is null and void.

Critical care staff needs more advanced assessment skills to recognize the initial stages of alcohol withdrawal syndrome to begin treatment early. They should also be aware of the individualized treatment needs of these patients depending on how severe their withdrawal manifests.

In advanced practice nurses and critical care nurses (P), will the implementation of the Minnesota detoxification scale (MINDS) (I) increase awareness and knowledge of alcohol withdrawal syndrome (AWS), improve assessment skills, and increase the number of patients identified with early AWS (O) within two d post education completion (T)?

Available Knowledge

Recent data has shown that excessive alcohol use is one of the most common causes of premature mortality, or death, in the United States from acute conditions like injuries from motor vehicle accidents and chronic conditions such as alcohol liver disease (US Preventive Services Task Force et al., 2018). Up to 42% of hospitalized patients have alcohol use disorder (AUD), and one-third of those patients are admitted to the intensive care unit (ICU) (Jesse et al., 2016). When withdrawal symptoms are allowed to progress to severe AWS, which includes seizures and delirium tremens (DT), the length of stay is more than doubled, and their mortality rates are comparable to those with severe malignant diseases (Jesse et al., 2016).

Escalating treatment with benzodiazepines, considered the cornerstone of therapy in patients with AWS that begins early on, shows a decrease in ICU length of stay (LOS) (Lee et al., 2019). Efficient treatment of withdrawal symptoms can alleviate or lessen the distress experienced by the patient both mentally and physically, prevent the progression

of AWS into more severe symptoms that may require invasive procedures, and anticipate collective effects that might worsen future withdrawals. The standard of care for AWS has been based on CIWA-AR administration of benzodiazepines. The protocol used with the CIWA-AR is both antiquated and has been associated with dangerous outcomes for some patients, as it uses a fixed-dose protocol that does not account for individual patients' symptoms. Over sedation, respiratory depression, and delirium are due to the large doses of lorazepam (Tidwell et al., 2018). One study used the Yale Alcohol Withdrawal Protocol (YAWP), which pairs the Minnesota Detoxification Scale (MINDS) with algorithms using benzodiazepine (BZD) regimens and suggests adjunctive therapies that saw significant positive results. The results include a decreased use in intubation and, thus, a reduction of ventilator-associated pneumonia (VAPs). After the study adjusted the results for demographics, adjunctive therapies, and APACHE II scores, the implementation was associated with a decreased odds of ICU intubation (odds ratio 0.13, 95% confidence interval 0.04-0.39) (Heavner et al., 2018).

On the contrary, some studies promote the usage of focused benzodiazepine (BZD) treatment for a patient with signs of AWS. One study followed patients who received a fixed or focused BZD therapy and patients treated according to the SHOT score throughout their LOS. The SHOT score (sweating, hallucinations, orientation, and tremor scale) is used in many emergency departments to assess for non-agitation symptoms and uses an acronym for sweating, hallucinations, orientation, and tremor. The study concluded that both groups received the first dose of BZD at about the same time, and there was not much difference in the total amount of diazepam use. However, there

was a significant reduction in hospital LOS and ICU length of stay with the group that received focused dosing of BZD (Lee et al., 2019).

Specific Aims

This project aims to raise awareness of the prevalence of AWS within the critical care setting, build on the assessment skills of critical care staff, and decrease the risk of mortality and morbidity associated with AWS. The prevalence of patients with alcohol abuse disorder is often undervalued due to other factors of critical care admissions, but it should not be discarded. AWS is often missed or overlooked due to being camouflaged by other medical conditions. Clinical staff should be aware of the overt but early warning signs of impending signs of withdrawal and not rely on subjective and often misleading historical information provided by patients and families. By having more competent critical care nurses and practitioners, treatment of AWS can be initiated earlier and managed more appropriately, decreasing morbidity and mortality rates due to alcohol withdrawal syndrome.

The specific aims of the research include the following:

- Quantifying the prevalence of alcohol use and its impact on the healthcare system.
- Identifying current methods of assessment for AWS used in the hospital setting.
- Understanding the specific needs of critical care staff to provide quality care.
- Identifying the importance of nurse education related to patient outcomes.

Synthesis of Evidence

A literature review was conducted better to understand alcohol use disorder, alcohol withdrawal syndrome, and the aptitude of nurses to care for the specific population of patients experiencing AWS in the critical care setting. The following databases were utilized in the literature search: Cumulative Index for Nursing and Allied Health Literature (CINAHL), *Google Scholar*, Joanna Briggs Institute Cochrane Library, and PubMed. The terms used to search the databases, either alone or in combination, included: alcohol withdrawal syndrome, intensive care, assessment tools, nurse management, Minnesota Detoxification Scale, and training tools. The search was limited to sources written within the last ten years to obtain the most relevant data.

Define Alcohol Use Disorder and Alcohol Withdrawal Syndrome

There is an estimated that 76.3 million people worldwide living with an alcohol use disorder (Jesse et al., 2016). When there is a pattern of alcohol use that has led to functional impairment or distress and is displayed as decreased control over use, social impairment, risky use patterns, and physiologic tolerance and withdrawal, alcohol use disorder (AUD) develops (Wolf et al., 2020).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines alcohol withdrawal as two or more distinguishing symptoms that develop within several hours following a significant decrease in alcohol consumption after a prolonged period of heavy drinking (American Psychiatric Association, 2013a, pp. 233–237). These symptoms include nausea or vomiting, autonomic hyperactivity, insomnia, increased anxiety and agitation, tremor, perceptual disturbances, and seizures. Notably, alcohol withdrawal occurs when there is a relative decrease in serum alcohol level compared to a

complete absence of alcohol. This means that individuals may still experience withdrawal symptoms while serum blood levels continue alcohol.

The clinical presentation of withdrawal can be seen within 48 hours and up to 72 hours after the last consumption of alcohol (Amato et al., 2011). The symptoms can vary from mild to severe within this time frame. Limiting or decreasing the severity of AWS is the goal of treatment within the ICU setting. The autonomic symptoms are the easiest for nurses and providers to assess, as they are objective and do not require the verbal participation of the patient. Some of the autonomic symptoms to watch for are tachycardia, tachypnea, dilated pupils, elevated blood pressure, temperature, diaphoresis, nausea, vomiting, and diarrhea.

Prevalence of AWS

Alcohol is the most abundant substance in the United States of America (USA). Yearly, excessive alcohol use is responsible for more than 80,000 deaths in the nation and more than 2.5 million deaths globally due to acute and chronic complications (Wolf et al., 2020). Furthermore, over 500,000 emergency department visits nationally can be linked to alcohol-associated events annually (Lee et al., 2019).

Challenges to Treatment

The deficit in knowledge and education has created a lack of confidence in nurses to provide appropriate care (Lee et al., 2019). When the healthcare team is not adequately trained to care for patients with alcohol withdrawal syndrome, treatment can be delayed, injuries can happen to patients and staff members, and providers lose confidence in the abilities of the bedside staff caring for the patients.

It is worth noting that other concerns noted when researching challenges related to delirium within the acute care setting besides lack of knowledge or education were the heavy workloads felt by nurses and practitioners, staffing constraints, a lack of resources, and safety concerns (Thomas et al., 2021). The increased demands of caring for patients with delirium can make nurses feel burnt out, frustrated, and overwhelmed. Often, these patients need one-to-one care for safety, but this is not always possible with the shortages of healthcare workers. Without a tool to validate these patients' critical nature, it is hard to justify the costs of decreasing patient loads, extra staff, and more equipment. The demand versus supply shortage places patients and staff in an unsafe situation. The shortage of resources and staff has left nurses feeling vulnerable and unsupported, unable to deliver quality care (Lee et al., 2019).

Significance of Benzodiazepines that Justifies Higher Education

Benzodiazepines (BZDs) have been the cornerstone of treating patients with AWS. The effects of BZDs are similar to that of ethanol, as it modulates the binding of Gamma Aminobutyric Acid (GABA) to the GABA-A receptor, which causes an inhibitory response (Jesse et al., 2016). Improving the autonomic hyperactivity seen with tachycardia, hyperthermia, hypertension, and seizures is the goal of acute treatment (Wolf et al., 2020). Benzodiazepines have sedative, hypnotic, muscle-relaxant, and anticonvulsive effects that allow control over the symptoms of withdrawal.

Reasons for Flex Dosing versus Fixed Dosing

Fixed dosing requires that the BZD is given in four equal doses throughout the day (Yitayih et al., 2019), regardless of patient presentation. Nevertheless, a collective dose must be calculated by giving roughly 5 mg of diazepam (fast acting) for each

standard alcoholic beverage consumed daily. The collective dose is divided into four scheduled doses. While this dosing style is effective, it has also been dangerous for some. There is a greater chance of over or under-medicating with fixed dosing, as individual symptoms are not placed in the equation. The accumulation of high doses can lead to a decreased level of consciousness, respiratory depression, and severe hypotension. The effects of oversedation lead to more time in bed, resulting in a prolonged recovery.

Additionally, some patients are at risk for seizures because the dosing is inadequate for their specific level of withdrawal (Yitayih et al., 2019). A fixed-dose protocol is also inappropriate for critical patients in the ICU that have life-threatening issues affecting one or more body systems. The most adverse (and dangerous) effect of the fixed-dose regimen that justifies the need for revamping the current practice for these patients is the usage of invasive procedures and products such as endotracheal tubes for airway support, central venous catheters, arterial catheters, and foley catheters. All these things are vital to caring for patients in critical condition but have risks associated with their use and should be used sparingly and with caution.

Symptom-triggered, or flexed dosing, determines the appropriate dose based on the presentation of symptoms (Littlefield et al., 2018). Some of the reasons that many providers are in favor of more flexible or symptom-triggered dosing are because it is more individualized and calls for monitoring and documenting symptoms (Yitayih et al., 2019). The medical community has found that screening tools with accompanied, individualized treatment algorithms have better outcomes for patients than a blanket protocol with a fixed drug regimen.

CIWA-Ar for the Clinical Setting

The Clinical Institute Withdrawal Assessment for Alcohol revised (CIWA-Ar) is still considered the gold standard for assessing patients who exhibit withdrawal signs (Littlefield et al., 2018). The tool consists of 10 categories, each with a numerical rating scale. The total of each scale is then combined to determine the very mild, mild, modest, or severe withdrawal score. The score is then used to determine the treatment plan. The categories are nausea/vomiting, paroxysmal sweats, anxiety, agitation, tremor, headache, auditory disturbance, visual disturbance, tactile disturbance, and orientation. Patient participation is a requirement for this tool, making it a challenge when other medical factors prohibit patient communication or when AWS has progressed to more severe stages.

MINDS for the Critical Care Setting

The Minnesota Detoxification Scale (MINDS) was developed to provide a more methodical and reliable assessment of patients with severe AWS that required ICU admission (Littlefield et al., 2018). that assesses for a pulse, blood pressure, tremor, sweating, hallucinations, agitation, orientation, delusions, and seizures. Like the CIAWH-Ar, each category is then rated and scored to determine the level of withdrawal. Unlike the CIAWH-Ar, patient participation is not required, making it more appropriate for the acute care setting (Littlefield et al., 2018). Another note worth the advantage of using the MINDS instead of CIAWH-Ar, in the critical care setting is the integration of hemodynamics into the assessment. The ICU setting provides an environment where constant monitoring of vital signs is plausible and is more of an appropriate setting for patients with hemodynamic instability and multiple medical conditions.

A significant advantage to using the MIND scale is the individualized care that is provided versus the standardized care given with the current protocol. Some patients will require less benzodiazepine, while others may require more. The goal of acute treatment is to control the symptoms of AWS. Proper treatment of symptoms will lead to more motivation to continue treatment of AUD once discharged (Yitayih et al., 2019). Other strengths of the MINDS tool are a reduction in invasive procedures and products, fewer hospital-acquired injuries, and a quicker recovery. The cons to using the MINDS tool are a learning curve for implementing the tool and adjusting time management for nurses to account for the frequent reassessments of these patients.

Studies that Back MINDS in the ICU

One retrospective study at Temple University Hospital in Philadelphia, PA, that utilized pre- and post-protocol implementation of symptom-triggered management with the Minnesota Detoxication Scale (MINDS) saw improved patient outcomes within the medical ICU. They found that while most patients required a similar duration of treatment, the post-protocol group had a shorter length of stay (LOS), less need for intubation, and an overall decrease in BZD exposure compared to the pre-protocol group. The LOS went from 10.5 PRE to 9.0 POST, intubation rates went from 20.8 PRE to 12.5 POST, and median BZD daily dosing went from 23.4 mg PRE to 11.3 mg POST (Harris et al., 2019).

In 2015, Patel et al. did a comparison study of the MINDS against the CIWA assessment protocols, emphasizing using a high front-loading dose of diazepam as part of the treatment plan for patients with AWS. The study concluded that while the population treated with the high-dose diazepam protocol in conjunction with the MINDS had a

higher hospital readmission rate within 30 days, they required less use of physical restraints, had shorter hospital LOS, and needed fewer days on BZDs.

Another study showed a reduction in intubation and ICU-related pneumonia following the installation of the MINDS tool. The study involved 233 patients in a 36-bed medical ICU. showed a 25.9% intubation rate pre-protocol versus 8.5% post-protocol. And the rate of ICU-related pneumonia when from 21.6% to 10.6 % post-protocol (Heavner et al., 2018).

The Importance of Education in the Critical Care Setting

Educating critical care nurses and advanced practice nurses about alcohol withdrawal syndrome and a more appropriate assessment tool, such as the MINDS, will help raise their confidence in providing quality care for such a fragile demographic and improve patient outcomes that will benefit both the organization and the patient, along with decrease mortality and morbidity associated with AWS. A more abundant knowledge fund of the effects of alcohol abuse and AWS can lead to a more therapeutic nurse-patient relationship.

Improved Knowledge Leads to Better Outcomes

When nurses and advanced practice nurses are not equipped with the tools needed to care for delirious patients, such as education, enough staff, and assessment tool; the patients are at a greater risk for functional decline, falls, and increased mortality and morbidity (Thomas et al., 2021). Empowering staff through education is key to supporting better patient outcomes. Education will increase positive patient outcomes while decreasing adverse outcomes, foster a more productive relationship between staff

and providers, improve staff's self-efficacy, and promote informed decision-making skills (Kennedy et al., 2017).

Rationale for Increasing Education for Critical Care Staff

From an organizational standpoint, hospital-acquired infections are one of the most expensive costs to treat and pose a significant liability to the facility and the providers. "Hospital-acquired infections in US hospitals have direct medical costs of at least $28.4 billion annually. They also account for an additional $12.4 billion in costs to society from early deaths and lost productivity" (CDC, 2021). With the high number of patients at risk for undergoing AWS while in the hospital, it seems apparent to find a better way of treating these patients and their symptoms so that less use of invasive procedures and catheters are used, thus decreasing the number of hospital-acquired infections. Quality care starts with the bedside nursing staff, which includes advanced practice nurses. "Nurses provide the frontline care for patients and need to take on a more active role in prevention, early identification, and treatment of delirium" (Thomas et al., 2021). An ameliorated trained staff combined with an individualized assessment tool and an order set that can treat individually can lessen the burden of the providers and the organization.

From a patient standpoint, if the management of AWS is updated to account for individual needs, these patients will be in a better position to continue their treatment upon discharge from the hospital and start the recovery process. Those with AUDs that undergo AWS pose as a fragile but prevalent demographic. The hospital setting could be doing more to ease them through this scary and often dangerous situation. Treating

symptoms before devastating and traumatic events occur the patient safer in both the short term and long term.

Conceptual Framework

The Plan Do Study Act (PDSA) model used the scientific framework to guide the doctoral project. In 1950, Dr. W. Edwards Deming constructed the framework, which has since been put into practice in various fields, from engineering to health care. The PDSA (plan-do-study-act) method should be a valuable tool for organizations to create an emergent quality improvement process (Younger, 2020). The PDSA cycle uses a four-set approach that identifies an opportunity to:

1. Plan a change to improve outcomes for patients and staff members.
2. Do the plan.
3. Study the plan and make changes as needed.
4. Incorporate changes and establish quality improvement for patients and staff members.

Using the four components of the PDSA, the following discussion provides information on how the PDSA was applied to this project.

The planning stage consisted of preparing the training tool that would be used to educate staff on the Minnesota detoxification scale (MINDS). The project leader conducted a needs assessment with the Critical Care Nurse Council to determine if the MINDS tool would lead to more positive outcomes for patients and staff. During the initial phase, a pre and post-test were developed, a training module was created, and the data collection process was determined. The project's overall objective was to increase

nurses' and practitioners' knowledge and capability in providing quality for patients with alcohol withdrawal syndrome while in the intensive care unit.

The second phase consisted of carrying out the plan. Once training module was created, it was time to deliver the education to volunteering participants. After eligible participants were identified and informed consent was signed, the project leader asked the critical care nurse council to disperse the pre and post-tests. The training module was delivered through a *PowerPoint* presentation placed throughout the working environment.

The study phase involved investigating the data received from the participants. Then analyzing the data to find how many patients were discovered as possibly going AWS and what stage of withdrawal they were going through. As the physicians and practitioners still determined the treatment plan, the treatment plans were not included in the project. Data analysis was an essential step in the PDSA process. The act phase included determining if the educational module placed nurses and practitioners in a better position to care for patients undergoing alcohol withdrawal syndrome in the intensive care unit once the training was completed and the tool was implemented.

Doctor of Nursing Practice Essentials

According to the American Association of Colleges of Nursing (2006) the DNP degree contains eight essential elements for nursing practice. The DNP essentials are regarded as the underpinning of core competencies to be achieved by nurses who receive a doctoral degree. Each DNP concept or essential can be seen in this project, as seen in the following:

Essential I: Scientific Underpinnings for Practice

The nursing discipline focuses on positive changes in health status that are affected by the actions or processes of nurses. Continuous education and integration of new practice approaches will positively affect both patients and nursing staff.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

This project involves taking a closer look at the impact of practice policies and procedures to ensure accountability for quality health care and patient safety for the populations they serve.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

With this project, a quality improvement strategy will be designed, directed, and evaluated that promotes timely, effective, efficient, and patient-centered care.

Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

The MINDS tool will have to be documented in a way that is quickly interrupted across the medical team. To do this, the electronic medical recording system will have an essential supportive role in incorporating this tool into the existing charting system so that the data can be evaluated and monitored, as is the foundation for this Essential.

Essential V: Health Care Policy for Advocacy in Health Care

The fragile demographic of patients with AWS calls for engagement in the policy development process to tailor the healthcare system to meet their specific needs.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Collaboration with the education department, IT experts, pharmacists, and social workers is essential to the success of this project and to improving outcomes for both the patients and nursing staff.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

While the project does not necessarily have a direct emphasis on population health or prevention, it does, however, use the foundation of Essential VII by analyzing epidemiological, biostatistical, environmental, and other appropriate scientific data related to individual, aggregate, and population health (American Association of Colleges of Nursing [AACN], 2019).

Essential VIII: Advanced Nursing Practice

By conducting a comprehensive and systematic assessment of health and illness parameters in complex situations and incorporating diverse and culturally sensitive approaches, as in Essential VIII (AACN, 2019), the project hopes to improve the quality of care being delivered to the demographic with AUD that experience AWS while in the ICU setting.

Summary

The literature that has been reviewed led to the conclusion that there is much room for improvement in the way alcohol withdrawal syndrome is managed within the intensive care setting. While the preferred treatment method for AWS is still up for debate, the initial step in improving patient outcomes is in the advancement of assessment

skills in the staff. An educational tool to help facilitate a more effective and efficient assessment of patients at risk for developing alcohol withdrawal syndrome will be discussed in this doctoral project.

CHAPTER II – METHODOLOGY

"Despite the high prevalence of AWS among ICU patients, no guidelines for the recognition or the management of AWS, including delirium tremens, in the critically ill currently exist, leading to tremendous variability in clinical practice" (Dixit et al., 2016). The goal of this project was to help provide a standard of care that can assist critical care staff and providers in recognizing the signs of AWS so that treatment can be focused on a more individualized basis to account for the independent and varying needs of each patient. By having a standard of care to treat patients at risk for alcohol withdrawal syndrome, there can be a decrease in hospital-acquired infections and injuries. However, before a standard of care can be initiated, staff must be educated on AWS's prevalence, dangers, and symptoms, along with a tool to help guide their assessments.

Interventions

The interventions to reach this DNP project's goal begins with a review of the literature to better understand alcohol use disorder, alcohol withdrawal syndrome, and the aptitude of nurses to care for the specific population of patients experiencing AWS in the critical care setting. After sufficient background research complied, an educational module was developed on AWS and the MINDS tool that was tailored to the specific needs of the critical care nursing staff and advanced nurse practitioners. The context of the project will revolve around assessing patients in the ICU for alcohol withdrawal syndrome so that treatment can be immediately initiated to ward off the more severe and life-threatening phases of withdrawal, like seizures and Delirium Tremens.

The module consisted of a PowerPoint presentation that highlighted the following:

- Benefits of training
- Defined alcohol use disorder and alcohol withdrawal syndrome
- Discussed symptoms of AWS on a relative timeline and the dangers of delayed treatment
- Uncovered barriers to treatment, both subjective and objective
- Compared the MINDS to the CIWA-Ar
- Discussed “pearls of wisdom” when using the MINDS
- Reviewed treatment options, including a pharmacology overview
- Lastly, the goals of MINDS integration into practice were established, both patient-centered and non-patient-centered.

A pre-training questionnaire, as well as a post-training questionnaire, was developed to assess funds of knowledge and obtain demographic information. The post-training questionnaire also allowed feedback and constructive criticism of the training module. The results, along with the feedback for the module, were complied with to evaluate the effectiveness of the education.

Population

The population to be included in this project will consist of acute care nurse practitioners (ACNPs), medical students, and ICU nurses. Forty-two staff members volunteered to participate in a pre-training questionnaire, then viewed the training module, followed by a post-training questionnaire. Three ACNPs, one medical student, and 38 registered nurses were included in this study. The requirements for participation were to actively work in an acute care setting and hold an active license to practice as a registered nurse or advanced practice nurse. To gain from the experiences of other

facilities, travel or contract nurses were offered to participate. Medical students were also invited to participate in accessing their current knowledge level.

Setting

The study will take place in a 50-bed open intensive care unit in a level II trauma center. By being a level II trauma center, the facility can initiate care for all injured patients. The components necessary to be classified as a level II trauma center are 24-hour immediate coverage by general surgeons and coverage by the specialties of orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, and critical care (American Trauma Society [ATS], 2019). The intensive care unit is an open unit, meaning that all patients who require critical care are in the same unit, whether their needs are neurological, trauma-related, medical, or surgical. The cardiovascular surgical patients are also housed in the same unit. There are three intensivists and one nurse practitioner on the unit during the day and one intensivist and one nurse practitioner at night, seven days a week.

Recruitment and Consent

Participation was voluntary. Once the pre and post-tests and training modules were developed, posters promoting the project were placed in areas where staff frequently congregate, asking for volunteers. The signage provided detailed information about the project and requirements for participation. Those willing to participate in the project were directed to contact the project leader or a member of the critical care nurse council (CCNC) to obtain consent. As participants' information was to be kept confidential, the only time that personal identifiers were required was on the consent form so that performance could not be linked to the individual. To avoid any inference

with job duties or time constraints, volunteers could complete the pre-training questionnaire once the consents were signed. The *PowerPoint* presentation was printed for viewing and left in several locations throughout the unit. The post-training questionnaire was collected before the end of the workday. To gain participation from as many staff members as possible, the research was conducted over a two-day period, which consisted of four different rotations of staff members.

Pre-training Questionnaire

After obtaining consent from participants, a pre-test questionnaire was conducted. The participants were then directed to the *PowerPoint* presentation throughout the critical care unit. The participant was given a time frame of 1 day to view the training module. The *PowerPoint* module was printed and posted to allow maximum participation at the volunteers' convenience.

Post- training Questionnaire

A post-test was given to judge if there was an increased level of knowledge and if the confidence of critical nurses and ACNPs in the recognition and treatment of patients with alcohol withdrawal syndrome was raised. The implication of the MINDS tool was also assessed in the post-test. Demographic information was gathered as part of the pre and post-training questions for further comparisons, such as age, sex, years of critical care experience, and different experience.

Outcome Measure

Outcomes were developed and set as the source of measuring the validity of this doctoral project. The outcomes were compared through the use of the pre-training and

post-training questionnaires. The following objectives were used to validate the training material:

- Critical Care staff will identify common barriers related to the negative stigma associated with alcohol abuse that may deter patients from being honest about their use.
- Critical Care staff will be able to recognize physical barriers to early and efficient treatment of AWS.
- Critical Care staff will be able to efficiently use the MINDS tool and articulate the results to providers.
- Critical Care staff will be able to apply their training to improve the quality of care provided to patients.

Ethics

The publication of data gained from this doctoral project will be limited to the requirements set by the Institutional Review Board (IRB) of The University of Southern Mississippi (Protocol # 22-1018). Thus, there is no intention to publish the research findings outside The University of Southern Mississippi's digital repository, *Aquilla*. Electronic medical records were not viewed for this study's purposes, as the study's foundation was based on the educational needs of staff members.

Summary

The expected outcomes for the staff within the ICU are a better understanding of the prevalence of AUD and AWS within the community they serve. A better understanding of the disease process will allow for a more compassionate level of care. The educational training will also enable caregivers to better identify the signs and

symptoms of AWS in patients that may not be excellent or reliable historians for several reasons. Long-term possibilities of the training module and implementation of the MINDS tool are a reduction in the number of patients that require ventilator support or at least a reduction in the number of days spent on the ventilator. The ICU could also see a decrease in invasive equipment used on patients, decreasing the number of hospital-acquired infections and reducing the need for physical restraints.

While the nursing staff will be the prominent focus of the project, the patients will gain many positive outcomes from the training tool. They will have a more compassionate and understanding staff to care for them. Patients will have a less traumatic experience of AWS and a decreased length of stay within the ICU. Patients will also benefit from reducing infections acquired while in the ICU. Lastly, with a smoother transition through AWS, patients will be more likely to continue the detoxification process in an inpatient psychiatric facility or on an outpatient basis.

CHAPTER III – RESULTS

The following information discussed in this chapter analyses the results of the implemented intervention. Forty-two critical care staff members participated in the study, comprising three acute care nurse practitioners, one medical student, and 38 registered nurses. The information collected from the pre-training and post-training questionnaires was compiled to establish whether the outcome measures were met. Demographic information was also collected from participants: age, sex, years of critical care experience, and additional healthcare experience. Frequencies and means were used to analyze demographical information and outcome measures.

Results, Measures, and Outcomes

The pre-training questionnaire was the baseline data and was conducted before the training intervention. The post-training questionnaire data was collected once the training module was viewed and the opportunity for implementation was given. The principal investigator reviewed the baseline data and compared the information to the post-training questionnaire.

Steps and Details

Before data collection commenced, the consent forms, pre-, and post-training questionnaires, and the training module were pre-approved by the committee chair and the USM's institutional review board (IRB) with the protocol number 22-1018. The pre-training questionnaire consisted of 13 questions that were either multiple choice or short answer, and the post-training questions were both multiple choice and short answer, totaling 14 questions. 24 *PowerPoint* slides were curated for the training module with concise and detailed information.

Compiled Results

The table below demonstrates the specific demographical information utilized in this study. Demographical information use obtained to give further insight to current diversity level of the critical care unit being studied.

Table 1

Sociodemographic Characteristics of Study Participants

Demographics	N	Valid %	N
Age			
21-25	6	14.29%	
26-30	16	38.1%	42
31-35	12	28.57%	
36-40	6	14.29%	
40+	2	4.76%	
Gender			
Male	10	23.81%	42
Female	32	76.19	
Years of Critical Care			
experience	10	23.81%	
Less than one year	17	40.48%	42
1-5 years	7	16.67%	
5-10 years	8	19.05%	
10+ years			

Table 1 (continued).

Other experience			
Yes	**30**	**71.43%**	**42**
No	**12**	**28.57%**	

The outcome measures complied for both the pre-training and the post-training questionnaire. Further highlighted was the pre-training questionnaire showed a significant lack of knowledge of the prevalence of AWS, with only 47.62% (N=20) of participants being able to relate the prevalence of patients that undergo AWS will need intensive care is 33%. The remaining participants either over or underestimated the critical impact of AWS on patients.

Table 2

Outcome Measures and Test Results

Outcome Measures	Pre-test Findings	Post-test Findings	N
Critical Care staff will identify common barriers related to the negative stigma associated with alcohol abuse that may deter patients from being honest about their use.	76.19% (N=32) of participants identified shame/guilt, fear of judgment or mistreatment, and denial as common barriers that often deter patients from being honest about their alcohol use. 11.9% (N=5) of participants selected shame/guilt as the only barrier. 11.9% (N=5) of participants selected denial as the only barrier.	100% of participants identified shame/guilt, fear of judgment or mistreatment, and denial as common barriers that often deter patients from being honest about their alcohol use.	42

Table 2 (continued).

Outcome Measures	Pre-test Findings	Post-test Findings	N
Critical Care staff will be able to recognize physical barriers to early identification and efficient treatment of AWS.	80.95% (N=34) of participants were able to recognize sedation, intubation, traumatic injuries, and other illness such as sepsis or DKA as physical barriers to early identification and efficient treatment of AWS 19.05% (N=8) of participants recognized only sedation as a barrier.	100% of participants were able to recognize sedation, intubation, traumatic injuries, and other illness such as sepsis or DKA as physical barriers to early identification and efficient treatment of AWS	42
Critical Care staff will be able to relate the prevalence of AWS and the expected consequences of delayed or missed treatment for these patients.	47.62% (N=20) of participants could relate that the prevalence of patients undergoing AWS will need intensive care is 33%. 47.62% (N=20) of participants chose 16%,	100% of participants could relate the prevalence of AWS and the expected consequences of delayed or missed treatment for these patients.	42

Table 2 (continued).

	and 4.76% (N=2) of participants chose none of the above 76.19% (N=32) of participants identified seizures, HAIs, Delirium Tremens, patient injuries, and prolonged hospitalizations as expected consequences of delayed treatment. 23.81% (N=10) of participants identified seizures as the only common consequence.		42
Critical Care staff will be able to efficiently use the MINDs tool and articulate the results to providers.	19.05% (N=8) of participants could efficiently use the MINDs tool and articulate the results to providers. 80.95% (N=34) of participants were not able to efficiently use the MINDs tool and be able to articulate the results to providers	100% of participants were able to use the MINDs tool efficiently. 19.05% (N=8) were able to articulate the results to providers.	42

As stated earlier, travel or contract nurses were invited to participate in the study to gain access to their knowledge fund and experiences. The pre-training questionnaire showed that 19.05% of participants had some experience with the MIND scale and were already

able to put it into practice. The assumption was made that those with familiarity with scale were either travel nurses or recently transplanted from another facility.

Observed Associations

Generally, the participants left positive feedback on the post-test questionnaire. Most of the concerns shared were related to documentation and time constraints caused by the frequent re-assessments required by the scale. Two participants offered plausible solutions, which showed enthusiasm for implementation. "It would be beneficial and helpful for nurses and providers to have the MIND scale built into our charting system," per volunteer. Another suggested having a place on the MAR (Medication Administration Record) that allows for documentation of the MIND score for congruence and reassurance when delivering prescribed medications. The feedback gave insight into the nursing staff's prescription and advanced practitioners' apprehension of delivering frequent doses of benzodiazepines while offering a resolution to the concern.

Unintended Consequences

The doctoral project was successful in obtaining the anticipated results. Thus, there was an increased fund of knowledge and awareness of AWS in the acute care setting and a rise in the confidence level of staff members to perform quality care to their patients. The assignment did not expose any unintended consequences.

Details of Missing Data

This doctoral project did not collect personal information from participants and sensitive patient information due to the specific aims listed earlier. The time constraints and lack of treatment algorithm for the project did not allow for case review information

such as the need for mechanical ventilation, invasive procedures or products, or the use of restraints.

Summary

In conclusion, there was an enhancement in the awareness of the prevalence of AWS and the consequences of the delayed or missed treatment. The project also provided an increased understanding of the critical nature of alcohol withdrawal that justifies the need for critical care. Participants were granted approval of the MINDS as superior assessment tools for the critical needs of the patients in which they serve. Lastly, there was enthusiasm among participants to integrate the MINDS into practice so that a higher level of quality care could be established.

CHAPTER IV – DISCUSSION

This chapter is an analysis of the compiled results of the doctoral project. The pre-training questionnaire will be compared to the post-training questionnaire results. The fundamental findings will be interpreted and discussed. The measured outcomes will be linked to the project's significance and relevance. As a final point, the principal investigator will offer recommendations and deliver a strategy for sustainability

Key Findings, Relevance, and Strengths

After the interventions were implemented, the post-training questionnaire outcomes indicated an overall improvement in the knowledge and ability to perform the MINDS assessment. While a limited number of participants were allowed to articulate the results of the MINDS tool to providers due to time constraints, all felt confident in performing the assessment. The reliability of the results of this study is considered a strength, as the results came after training was completed.

Interpretation

The post-training questionnaire results showed that all the outcomes were met and significantly higher than the pre-training questionnaire. Most importantly, the surveys allowed participants to interact and voice their concerns. Many were willing to offer solutions to said concerns, showing ownership and enthusiasm for implementing the MINDS tool.

According to the pre-and post-training questionnaire, continuous education is imperative to nursing staff and advanced practice nurses. Also notable is the willingness of nurses and ACNPs to participate in educational modules when the prevalence of the problem is highlighted first. The mode of delivery through a *PowerPoint* presentation

also seemed to make the process efficient and caused little to no interference with job duties.

Limitation

The most significant limitation of the project was time constraints due to deadlines. Given more time, more participants could have benefited from the educational module and permitted more time to put it into practice. Another limitation was the lack of a pre-approved therapy algorithm to use with the MINDS, as it is intended. While staff members agreed that the tool was more appropriate for the critical care setting, they could see the full effects of the scale and treatment together. The time limitations meant ventilator use, invasive procedures, and restraints were not tracked during the project timeline.

Sustainability

In order for the induction of the Minnesota detoxification scale to be sustainable in the acute care setting, several things must happen. First, the medical director and pharmacy department must develop or choose an appropriate therapy plan to be used with the scale. Second, the information technology (IT) department must build the scale into the electronic medical record. Moreover, a social work consult should be part of the protocol order set so that resources can be found and allocated to these patients and their families.

Recommendations

A future study of the long-term benefits of adequately treating AWS within the acute care setting could provide insight into the need for a detoxification center or other resources in the area. I would be interested to see if patients would be more willing to

complete the detoxification and rehabilitation process if there was a more seamless transition from the hospital to a detox center

Closing Project Summary

This project provided increased awareness of AWS expanded the knowledge base of critical care and advanced practice nurses and improved the assessment skills of these staff members. The MINDS scale fitted the acute and critical needs of the ICU setting and was found to help assess the needs of patients with AWS.

As a final note, the results show that improved knowledge of AWS and the MINDS tool renders a better equipped critical care staff to meet the needs of this fragile patient population. The more prepared staff members are, the higher the level of care can be provided, which is the ultimate end goal for all healthcare members

APPENDIX A – IRB Approval Letter

Office *of*
Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER:	22-1018
PROJECT TITLE:	Quality Improvement for Patients with Alcohol Withdrawal Syndrome Starts with an Evaluation Tool
SCHOOL/PROGRAM	Leadership & Advanced Nursing
RESEARCHERS:	PI: Jessica B Bass Investigators: Bass, Jessica B~Coleman, Carolyn~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	21-Sep-2022 to 20-Sep-2023

Donald Sacco

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B – Pre-training Questionnaire

1. What is your gender

- Male
- Female

2. What is your age?

- 21-25
- 26-30
- 31-35
- 36-40
- 40+

3. How long have you been practicing as licensed RN or NP in the critical care setting?

- Less than one year
- 1-5 years
- 5-10 years
- 10+ years

4. Do you have other healthcare experience besides critical care?

- Yes
- No

5. If yes to additional experience, please describe?

6. What are common reasons that deter patients from not being truthful about their alcohol use?

- Shame/Guilt
- Fear of judgement or mistreatment
- Denial
- All of the above

7. What is the average percentage of patients that undergo alcohol withdrawal syndrome that need intensive care?

- 16%
- 55%
- 33%
- None of the above

8. Do you feel capable of determining the subjective and objective signs of AWS?

- Yes
- No

9. Have you ever heard of the Minnesota Detoxification Scale?

- Yes
- No

10. If so, have you ever used the scale to help determine what stage of withdrawal a patient is in?

- Yes

- [ ] No

11. What are some barriers to recognizing patients with AWS?

- Sedation
- Intubation
- Traumatic injuries
- other illnesses such as sepsis or DKA
- none of the above

12. What are some common consequences for delayed treatment of AWS?

- Seizures
- Hospital acquired infections from invasive procedures
- Delirium Tremors
- Patient injuries
- Prolonged hospitalizations
- All of the Above

13. Do you feel more training is needed on the identification of AWS?

- Yes
- No

Thank you for your participation!

APPENDIX C – Post–Training Questionnaire

1. What is your gender

- Male
- Female

2. What is your age?

- 21-25
- 26-30
- 31-35
- 36-40
- 40+

3. How long have you been practicing as licensed RN or NP in the critical care setting?

- Less than one year
- 1-5 years
- 5-10 years
- 10+ years

4. Do you have other healthcare experience besides critical care?

- Yes
- No

5. If yes to additional experience, please describe?

6. What are common reasons that deter patients from not being truthful about their alcohol use?

- Shame/Guilt
- Fear of judgement or mistreatment
- Denial
- All of the above

7. What is the average percentage of patients that undergo alcohol withdrawal syndrome that need intensive care? 0

- 16%
- 55%
- 33%
- None of the above

8. Do you feel more capable of determining the subjective and objective signs of AWS since receiving the educational module?

- Yes
- No

9. Do you feel the Minnesota Detoxification Scale is a more appropriate tool for the ICU setting?

- Yes
- No

10. How many patients have you been able to apply the scale to since initiating into practice?

- 1-5
- 6-10
- 11-20
- 21+
- None

11. What are your concerns, if any, with using the scale?

12. Do you feel that earlier treatment of AWS could result in fewer negative consequences for patients?

- Yes
- No

13. Do you feel more training is needed on the identification of AWS?

- Yes
- No

14. What feedback can you offer regarding this project?

THANK YOU FOR YOUR PARTICIAPTION IN THIS PROJECT!

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