Title

The Barriers to Delirium Recognition and Assessment Among Critical Care Clinicians During the COVID-19 Pandemic

Author

Trask, Jonathan Spencer

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The Barriers to Delirium Recognition and Assessment
Among Critical Care Clinicians During the COVID-19 Pandemic

By

JONATHAN TRASK

DISSERTATION

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Approved:

Debra Bakerjian, Chair

Christiana Drake

Amy Nichols

Committee in Charge

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Dedication

"Delirium, whenever it arises, is always a matter of serious consideration to the medical practitioner, but especially so when it takes place in a disease, or during the progress of a case, in which its presence is unusual, and therefore unlooked for."

Thomas Salter, 1850

Delirium is one of the oldest known medical conditions; first described by ancient physicians like Hippocrates and Celsus. Despite our awareness of delirium, it remains a persuasive and misunderstood condition. I have had many encounters with delirium, both as a bedside nurse and in my personal life. The goal of completing this dissertation was to help expand the understanding of delirium so that, in some small way, the suffering of those with delirium might be eased. This dissertation is dedicated to the many who suffer through delirium and to those who encounter it.

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Abstract

Background: Delirium is a persistent problem among critically ill, hospitalized patients. Up to 80% of intensive care unit (ICU) patients might experience delirium, yet it is estimated that 75% of cases of delirium are missed. Delirium can result in multiple sequelae including long-term cognitive dysfunction and increased mortality risk. Delirium assessment and management methods are widely available; however, delirium remains an insidious consequence of critical illness and hospitalization. The COVID-19 global pandemic resulted in an increase in the rate of hospitalization of critically ill patients at risk for delirium. Past delirium research has been focused on physicians and nurses, but other clinicians who might encounter patients experiencing delirium have not yet provided their perspectives. There is limited understanding of the barriers to delirium recognition and assessment among critical care clinicians and the overall impact of the COVID-19 pandemic on these practices.

Methods: This was a multi-methods project consisting of quantitative and qualitative studies. The quantitative arm of this study was a survey centered on the delirium recognition and assessment practices and barriers to these practices among critical care physicians, physical therapists (PTs), physical therapy aides (PTAs), registered nurses (RNs), and respiratory therapists (RTs). Summary statistics, Fisher's exact test, and logistic regression were used to analyze responses and provide comparisons between clinician types.

The qualitative arm of this study consisted of focus groups with PTs, RNs, and RTs. Sessions followed a semi-structured interview guide. Sessions were recorded, transcribed verbatim, and thematic analysis was utilized to develop themes.

Results: One-hundred and fourteen clinicians responded to the survey. Most clinicians indicated that they used methods other than validated delirium assessment tools to evaluate for delirium.

Delirium was viewed as a lower priority issue among clinicians and the COVID-19 pandemic further deprioritized delirium.

A total of twelve clinicians participated in the focus group sessions. Participants indicated that delirium was perceived as a serious problem for patients, but was not a high priority to address. Lack of provider buy-in and inconsistent communication between clinicians were cited as barriers to consistent delirium recognition and assessment. The COVID-19 pandemic further exacerbated these barriers.

Discussion: Participants of both studies indicated that delirium was viewed as a lower priority issue when weighed against other issues that patients might experience. The COVID-19 pandemic further deprioritized delirium recognition and assessment due to the severity of illness that patients were experiencing. Clinicians indicated that barriers to delirium recognition were not utilizing validated assessment tools, inconsistent communication, and lack of provider buy-in with regards to using validated methods. There were noted differences between health professions regarding delirium recognition and assessment practices. The findings of both studies indicated that clinicians could benefit from additional delirium education and the inclusion of additional clinicians in the process of delirium assessment. Additional research on the perspectives of delirium among critical care clinicians and the impact of the COVID-19 pandemic on delirium recognition and assessment is needed.

Introduction

The first intensive care unit (ICU) was conceived in the early 1950's as a response to the overwhelming need for specialized, critical care during the polio epidemic occurring in Europe (Kelly et al., 2014). The strategies utilized in this ICU included higher levels of direct patient monitoring, the use of intensive ventilatory support, and aggregating specialists into a single care area (Kelly et al., 2014). These new strategies resulted in a mortality rate reduction during this epidemic from 80% to about 40%, which justified the benefits and continued proliferation of the then novel ICU (Kelly et al., 2014). Advances in technology and medicine allowed for the use of on-site laboratory analysis, intensive medical therapies, and automated physiologic monitoring which increased the capabilities and availability of ICUs (Weil & Tang, 2011).

Advances in critical care and greater utilization of ICUs have increased the likelihood of patient survival from critical illness, however, due to the fragile state of ICU patients, they are particularly vulnerable to iatrogenic harm (Kelly et al., 2014). The increased understanding of the potential harm that critically ill patients are exposed to through ICU care has resulted in industry wide implementation of preventive measures (Kelly et al., 2014). A salient example of a measure meant to reduce iatrogenic harm is the implementation of central line associated blood stream infection bundles, which are guidelines that help to ensure a reduction in infections associated with the use of large, centrally placed intravenous catheters (Kelly et al., 2014). Use of bundles like these have been associated with reduced infection rates and improved patient outcomes in the ICU setting (Kelly et al., 2014). While the understanding of critical care medicine and its potential consequences has improved, a particular problem remains ubiquitous with critical illness, the ICU, and hospitalization. This issue is the syndrome known as delirium.

Delirium is an acute confusional state characterized by a disruption of attention and cognition most often associated with critical illness and hospitalization (Inouye et al., 1999). Delirium is typified by disturbances of consciousness, perceptual disturbances (often in the form of hallucinations, delusions, or illusions), attention deficits, increased or decreased psychomotor activity, disordered sleep-wake cycles, and fluctuating presentation (Maldonado, 2008). Delirium is the most common psychiatric syndrome found in the hospital setting (Maldonado, 2008). The incidence of delirium can vary based on care areas, with rates at 10% in general medical surgical units and up to 81.3% in medical ICUs (Maldonado, 2008). Delirium is associated with increased mortality rates, prolonged hospitalization, and prolonged cognitive dysfunction after hospitalization (Maldonado, 2008). Delirium can result in individual daily healthcare costs ranging from $16,303 to $64,421 and has been estimated to cost $152 billion annually in the US (Maldonado, 2008). It is estimated that the majority of delirium cases go undetected among ICU patients (Zaal & Slooter, 2012). Past surveys of medical and nursing staff on delirium have shown that these clinicians feel that delirium is under assessed and ubiquitous in their care area despite the availability of validated screening tools (Oxenbøll-Collet et al., 2016; Elliot, 2014).

The severe acute respiratory syndrome coronavirus-2, also known as coronavirus disease 2019 (COVID-19) was declared a global pandemic in early 2020 (Vizheh et al., 2020). The clinical manifestations of COVID-19 can range from mild self-limited disease to life-threatening multi-organ failure (Hatmi, 2021). Presentation of COVID-19 can include respiratory symptoms (like cough or shortness of breath), pneumonia, acute respiratory distress syndrome, shock, and systemic inflammation in vital organ systems like the lungs, heart, central nervous system, and blood vessels (Hatmi, 2021). The rapid spread of COVID-19 has resulted in 30,277,908 cases and 549,098 fatalities in the US as of April 2021 according to the Centers for Disease Control

and Prevention (CDC) (2021a). COVID-19 became third leading cause of death in the US during 2020 behind heart disease and malignant neoplasms (Woolf et al., 2020). Adults aged 65 years and older are at greatest risk for severe disease, hospitalization, ICU use, and death accounting for more than 80% of COVID-19 related deaths in the US (Kennedy et al., 2020). Older adults with COVID-19 may also be at higher risk for developing delirium. Preliminary research has indicated that delirium can occur in 65% of older adult, ICU patients with COVID-19 (Kennedy et al., 2020). The estimated cumulative cost of the COVID-19 pandemic for the US (accounting for premature death, long-term health impairment, mental health impairment, lost productivity, and a COVID-19 induced recession) was more than $16 trillion, or 90% of the annual gross domestic product of the US (Cutler & Summers, 2020). COVID-19 had resulted in a cumulative hospitalization rate of 417.2 hospitalizations per 100,000 (CDC, 2021b). The long-term impact of the COVID-19 pandemic is not yet well understood. Early research has indicated that caring for the multitude of critically-ill patients with COVID-19 has led to health professions facing aggravated psychological pressure and mental illness (Vizheh et al., 2020). The COVID-19 pandemic resulted in a large influx of critically-ill patients who were at high-risk for developing delirium. There is a gap in the understanding of critical care clinicians' recognition of delirium, perceived barriers to delirium assessment, and whether they prioritize the assessment of delirium during the COVID-19 pandemic.

Gaps in the Literature

Despite the promise of delirium assessment methods like the CAM-ICU and nonpharmacologic delirium interventions like the multicomponent ABCDEF bundle, delirium rates persist at high levels (Morandi et al., 2018a). Current estimates of missed cases of delirium are as high as 75% (Zaal & Slooter, 2012). The availability of delirium assessment tools and

prevention bundles does not ensure the use of these tools and bundles (Zaal & Slooter, 2012). Critical care clinicians (nurses and physicians) consider delirium an important issue, but feel that it is under-assessed and mismanaged (Oxenbøll-Collet et al. 2016). A gap in the understanding of delirium is that there appear to be barriers to delirium recognition, assessment, and management among critical care clinicians outside of a research context. Currently the breadth of understanding regarding the barriers to delirium screening and management is limited to a small number of surveys of critical care clinicians (Rowley-Conwy, 2017). Many of these surveys had low response rates, focused specifically on nurses and physicians (and not other health professions who also provide care to patients with delirium), were performed outside of the United States, or were not performed within 10 years (Rowley-Conwy, 2017). The relationship between COVID-19 and delirium is not yet well understood; however, patients may be at an increased risk for developing delirium if they are also suffering from COVID-19 (Kennedy et al., 2020). The perceptions of delirium recognition and assessment (specifically the appraisal of prioritization, importance, and interference with delirium assessments) during the COVID-19 pandemic among critical care clinicians is not understood. To this end, the overarching problem is understanding the barriers to delirium recognition and assessment among critical care clinicians during the COVID-19 pandemic.

Purpose of Research

The goal of this dissertation was to understand the barriers to delirium recognition and assessment among adult ICU patients by critical care clinicians during the COVID-19 pandemic using a multi-methods design. For the purposes of this study, delirium recognition was the clinician's ability to identify patients at risk for developing delirium, or identify evolving features of delirium in patients. Delirium assessment was the clinician's use of a validated

clinical tool intended to determine the presence of delirium in patients. The definitions of the terms delirium recognition and delirium assessment used for this research have been defined in prior literature concerning the recognition and assessment of delirium (Boot, 2012; Moldonado, 2008). Critical care clinicians were defined across health professions as physicians, registered nurses, respiratory therapists, physical therapists, and physical therapist aides. This expanded group of critical care professions was of interest as they interacted with and managed the care of patients who may be experiencing delirium and COVID-19 during hospitalization. This study utilized a survey and focus groups with members of the health professions of interest at a large, academic hospital in order to further explain the attitudes and perceptions of critical care clinicians with delirium and its recognition and assessment during the COVID-19 pandemic.

Conceptual Framework

In order to elaborate on the problem of delirium as it occurs in the critical care environment, a framework was adapted from the Assessment of Quality of Care framework developed by Avedis Donabedian (1988). The Assessment of Quality of Care framework was described by Donabedian (1988) as a means to identify the integral components of health care delivery that can influence quality of care.

The framework is divided into three domains: structure, process, and outcomes, each containing discrete topics and features that can influence the other domains (Donabedian, 1988). Structure describes the physical attributes of the settings where care occurs which includes the material resources and human resources of the setting (Donabedian, 1988). Process describes the actions in giving and receiving care, or the clinician's activities in assessing, diagnosing, or implementing treatment (Donabedian, 1988). Outcomes is centered on the effects of care on the health status of the patient or population as well as the satisfaction of the experiences by the

clinician (Donabedian, 1988). The pathway of influence between each domain can vary based on the application of the framework, so it could have a unidirectional path (meaning good structure leads to good process which leads to good outcomes), a mediation path (good structure leads directly to good process and good outcomes and good process promotes good outcomes), or a reciprocal path (good structure leads to good process, good process leads to good outcomes and good outcomes in turn promote good process) (Ameh et al., 2017).

This framework can be used as a method to summarize abstract problems in order to develop potential solutions. So, for example, the authors of one study utilized the framework to conceptualize the issue of "boarding" high acuity patients in emergency departments in order to assess quality of care and define deficiencies or impediments impacting patients and their care (Liu et al., 2011). The Donabedian Assessment of Quality of Care framework was applied to the issue of recognizing and detecting delirium in order to conceptualize the surrounding contributing factors (See Figure 1).

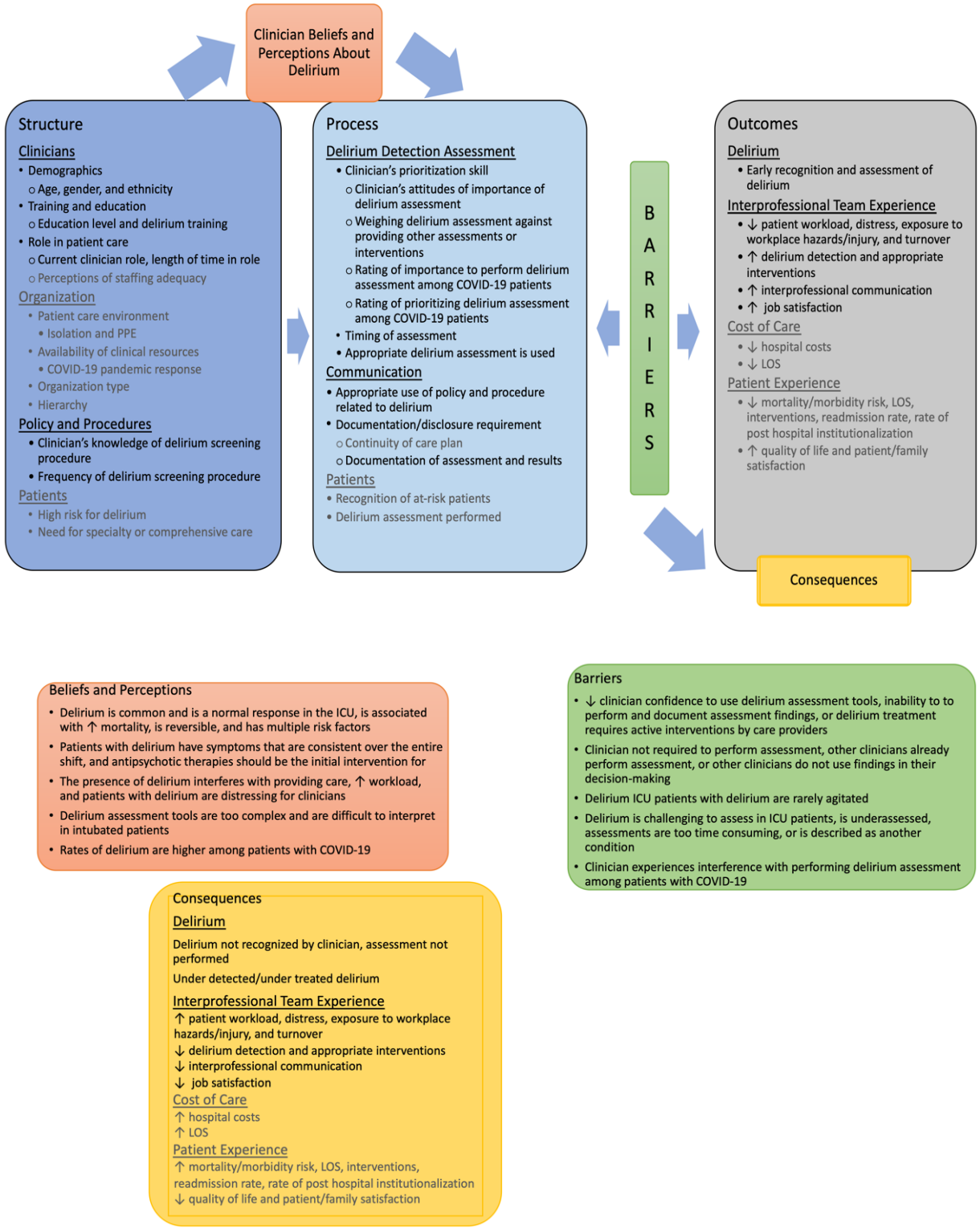

Figure 1. Adapted Donabedian Structure Process Outcome Model- Delirium Recognition and Assessment Framework

To summarize the model, the topics and features contained within structure (the clinicians, the organization, policy and procedures, and the patients), affect the processes of delirium detection assessment, communication, and patients, which lead to the outcomes associated with early recognition and assessment of delirium, the interprofessional team experience, the cost of care, and the patient experience. Outcomes may further influence the process domain impacting the features within the system. The topics and features within each domain that are grayed indicate subjects that cannot be addressed directly through the survey being used in this study that focuses on the barriers to delirium recognition and assessment. Outside of structure and process lie the mediators focused on clinician beliefs and perceptions about delirium. Between process and outcomes lie the moderator barriers. From barriers and parallel to outcomes is consequences, which contains alternatives to outcomes. Each domain will be elaborated upon further.

Structure.

Structure contains issues relevant to the clinicians working within the organization, the organization itself (including the physical structures of the organization and the clinician hierarchies present within), delirium policy and procedures, and patients. Features of clinicians relevant to delirium recognition and assessment include: demographic information (age, self-identified gender, and self-identified ethnicity), training and education (education or degree level and education regarding delirium), the clinician's role in patient care and length of time in the role. Perceptions of staffing adequacy may impact the ability of the clinician to carry out the process of assessment and may impact outcomes; however, this was not appraised through this study.

Aspects of the organization relevant to delirium recognition and assessment include: the patient care environment, the availability of clinical resources, the organization type, and the hierarchy. The patient care environment relates to the physical spaces where patients reside and where care occurs. The patient care environment (noise levels, exposure to light and dark, privacy, unpleasant or painful sensations, use of PPE and isolation for patients with COVID-19, and proximity to staff) has a known influence on the development of delirium in patients. The availability of clinical resources relates to the access to clinical expertise or relevant data (such as clinical specialists or physical and online medical resources) by the clinician and the ability of the organization to accommodate an influx of critically ill patients as a result of the COVID-19 pandemic. The organization type was the specific system of interest for this study, in this case a large academic health system. Hierarchy contains the hierarchical relationship of the interns and residents working with chief residents, fellows, attending physicians, and other interdisciplinary team members while managing the care the of ICU patients. Within this hierarchy, interprofessional staff report assessments and clinical information to intern and resident providers. This information may be then provided to the supervising provider (chief resident, fellow, or attending physician) by the interns or residents. Organizational hierarchy also includes the presence of student or learning healthcare professionals. Organization was not appraised through this study, though it has an influence on delirium, and its recognition and assessment.

Policies and procedures relevant to delirium recognition and assessment include the clinician's knowledge of delirium screening procedures and the frequency of the delirium screening procedure. Policies state which staff are responsible for providing the delirium assessment on a routine basis.

Patient issues include high risk for delirium and the need for specialty or comprehensive care. These represent the aspects of the patients served by the organization who also are at risk for developing delirium during hospitalization. Patients and its features were not appraised through this study.

Outside of the framework, an arrow pointed to the next domain, process, indicates the direct, uni-directional relationship that structure holds over process. Structure can be mediated by clinician beliefs and perceptions about delirium. An arrow from structure leads to this mediator, with another leading from it to the process domain, demonstrating the influence of beliefs and perceptions of the clinician on the process of delirium recognition and assessment.

Process.

Process are subjects relevant to the act of providing services or carrying out assessments. Within process, delirium detection assessment, communication, and patients are the main topics of focus. Features of the delirium detection assessment relevant to recognition and assessment of delirium include: the prioritization abilities of the clinician interacting with or caring for the patient (which includes the clinician's perceptions of the importance of delirium assessment and weighing the provision of the delirium assessment against providing other assessments or interventions for both patients with and without COVID-19), appropriate timing of the assessment, the appropriate assessment is used, and the appropriate clinician who uses the assessment.

Communication contains the appropriate use of delirium policy and procedure, the documentation and disclosure requirement, developing and maintaining continuity of an appropriate care plan, and documentation of the assessment and its results. Care plans were not appraised through this study.

Patients includes the recognition of patients at-risk for developing delirium, followed by the nursing staff's responsibility to provide the delirium assessment. Patients were not appraised through this study.

Outside of the framework, a two-way arrow pointed at the domains process and outcomes indicate the reciprocal relationship that the two domains hold over each other. A moderator, labeled barriers, lies between process and outcomes indicating the influence of barriers on the process of care delivery and outcomes. The influence of barriers could lead to a parallel outcome, labeled consequences.

Clinicians' beliefs and perceptions about delirium.

A mediator is a variable or group of variables that exists between a predictor and an outcome (Liu & Ulrich, 2016). A mediator helps to explain why or how the relationship between variables is present, and may account for a full or partial relationship between a predictor and outcome (Liu & Ulrich, 2016). The mediator represents the influence of clinician beliefs and perceptions about delirium on the process of delirium recognition and assessment. Mediators in this study include the belief or perception that: delirium is common and a normal response in the ICU, it is associated with an increased mortality, it is reversible, it has multiple risk factors, that patients with delirium have symptoms that are consistent over the entire shift, antipsychotic therapies should be the initial intervention for delirium, that the presence of delirium interferes with providing care, that workload increases, that patients with delirium are distressing for clinicians, that delirium assessment tools are too complex, that they are difficult to interpret in intubated patients, and that rates of delirium are higher among patients with COVID-19 compared to other ICU patients.

Barriers.

A moderator is an independent variable that affects the strength and possibly the direction of the association between other predictor and outcome variables (Bennett, 2000). The influence of the moderator on the causal pathway of predictor variables may intensify or weaken associations to outcome variables (Bennett, 2000). This moderator lies between process and outcomes and represents the influence that the barriers to delirium recognition and assessment can have on both the process and outcomes domains. The topics within this moderator include the low confidence of the clinician to use delirium assessment tools, the inability to perform and document assessment findings, the complex and active interventions required to manage delirium, the clinician assuming that they are not required to perform delirium assessments, the clinician assuming that other clinicians have already performed the assessment, the clinician assuming that other clinicians will not use their assessment findings in clinical decision-making, that patients with delirium are rarely agitated (typically a clinician will only assess for delirium when a patient is agitated). Additionally, the assumption that delirium is challenging to assess in ICU patients, it is underassessed, the assessments are too time consuming, that delirium is described as another condition (e.g. sun downing, encephalopathy, or organic brain disease), or that delirium assessments are interfered with among patients with COVID-19 (due to the use of PPE, isolation, or the perceived severity of the patient's illness) are also barriers. Each one of these barriers can influence outcomes with the potential to lead to a secondary, parallel outcome labeled consequences. These barriers were the center of focus through this study.

Outcomes.

Outcomes contains the topics relevant to the results of the processes delivered or carried out within the structure. Outcomes are also affected directly by the structure of an institution.

Outcomes is comprised of delirium, the interprofessional team experience, the cost of care, and the patient experience. Delirium includes early recognition and assessment of delirium by clinicians as a result of the structure and process domains. The interprofessional team experience is the associated outcomes from recognition and assessment of delirium by clinicians such as decreases in patient workload, distress, exposure to workplace hazards or injuries, and turnover rates. Outcomes associated with the successful recognition and assessment of delirium by staff also include increases in appropriate delirium interventions, interprofessional communication, and job satisfaction. Total cost of care is the decrease in hospital costs both for the patient and the institution with the successful recognition and assessment of delirium. Patient experience as an outcome associated with successful recognition and assessment of delirium including decreased mortality and morbidity risks, length of stay, interventions, readmission rates, and post hospital institutionalization rates. This is also composed of increases in quality of life and patient and family satisfaction. Patient experience and cost of care were not addressed through this study. In parallel to outcomes is the consequences domain.

Consequences.

Consequences represents a parallel to the outcomes influenced by the barriers moderator. Consequences includes delirium, the interprofessional team experience, cost of care, and patient experience. These contain the inverse features of outcomes, in that they represent the negative influence of delirium on clinicians, the hospital, and the patient. Delirium includes delirium not being recognized by the clinician (and not assessed) and delirium remains under-detected and undertreated. The interprofessional team experience includes: increases in patient workload, distress, exposure to workplace hazards and injury, and turnover. This also includes decreases in delirium detection and appropriate interventions, decreases in interprofessional communication,

and decreases in job satisfaction. The cost of care includes the features of increases in hospital costs and length of stay. The patient experience includes: increases in mortality and morbidity, length of stay, interventions, readmission rates, and rates of post-hospital institutionalization. They also include: decreases in quality of life and patient/family satisfaction. The cost of care and patient experience were not addressed through this study.

Summary.

This model attempts to organize the influence of structure on the process and outcomes of delirium recognition and assessment by critical care clinicians. The included mediator and moderator, clinician beliefs and perceptions about delirium and barriers, attempt to further explain the potential influences that lie outside of the structure, process, and outcomes domains on delirium recognition and assessment. The parallel outcome, consequences, allows further explanation of the known issues that occur from not detecting or assessing for delirium.

Specific Aims

This dissertation is centered on addressing the following specific aims:

Aim 1: To describe and compare the differences among critical care clinicians (registered nurses, physicians, respiratory therapists, physical therapists, and physical therapy aides) in the roles, responsibilities, and perceived barriers to delirium recognition and assessment practices.

Aim 2: To further explore and examine the attitudes, perceptions, and levels of stress among critical care clinicians when caring for patients with delirium.

Aim 3: To explore the impact of the COVID-19 pandemic on the delirium recognition and assessment practices of critical care clinicians.

Manuscript Summaries

This dissertation addresses gaps in the understanding of the barriers to delirium recognition and assessment among critical care clinicians during the COVID-19 pandemic using a multi-methods approach in two manuscripts, which are included as appendices A and B:

1. *Delirium Recognition and Assessment Among Critical Care Clinicians During the COVID-19 Pandemic* was a quantitative study that utilized a survey of multiple health professions in order to describe and compare the differences of the delirium recognition and assessment practices between clinicians and the barriers to delirium assessment during the COVID-19 pandemic.
2. *Interprofessional Perspectives of the Barriers to Delirium Recognition and Assessment During the COVID-19 Pandemic* was a qualitative study that utilized focus group interviews with multiple health professions in order to further explore and examine the attitudes and perceptions of the barriers to delirium recognition and assessment and the impact of the COVID-19 pandemic on delirium assessment and management practices.

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Appendix A (Manuscript 1)

Delirium Recognition and Assessment Among Critical Care Clinicians During the COVID-19 Pandemic

Abstract

Objectives: To examine the barriers to delirium recognition and assessment among critical care clinicians (physicians, physical therapists/physical therapist aides, registered nurses, respiratory therapists) during the COVID-19 pandemic utilizing a survey of clinicians.

Methodology: A web-based survey was conducted at a large, academic hospital. Analysis was performed using Fisher's exact test and logistic regression to examine barriers to delirium assessment based on clinician type.

Results: One-hundred and fourteen clinicians responded to the survey. Most clinicians responded that they assess for delirium at least once per shift, though they indicated that they utilized methods other than validated assessment tools. Respondents viewed performing delirium assessments as a low priority during the COVID-19 pandemic.

Conclusions: Clinicians indicated several barriers to delirium recognition and assessment. The COVID-19 pandemic deprioritized delirium assessments among clinicians. Delirium assessment education and practice could be expanded to include additional clinicians to reduce the rates of missed or overlooked cases of delirium.

Introduction

The COVID-19 Pandemic

The coronavirus disease 2019 (COVID-19) global pandemic has resulted in 30,277,908 cases and 549,098 fatalities in the United States as of April 2021 according to the Centers for Disease Control and Prevention (CDC) (2021a). COVID-19 has been associated with a

cumulative hospitalization rate of 417.2 per 100,000 in the US as of January 2021 (CDC, 2021b). Adults 65 years and older appear to have a higher risk of COVID-19 associated disease severity, hospitalization, and death compared to other age groups and have accounted for more than 80% of COVID-19 related deaths in the US (Kennedy et al., 2020). The COVID-19 pandemic also presented a major economic threat, with the estimated combined costs associated with premature death, long-term health impairment, and mental health impairment at $8.5 trillion in the US (Cutler & Summers, 2020). COVID-19 has presented as a major health threat to the population of the US, resulting in increased hospitalization and mortality.

Patients hospitalized with COVID-19 often have respiratory symptoms that may contribute to the transmission of the virus to clinicians and hospital staff, other patients, and hospital visitors (Hatmi, 2020). Therefore, hospitalized patients with COVID-19 are placed in isolation to reduce the risk of disease transmission (Hatmi, 2020). While the main benefit of isolation is to mitigate the spread of contagious diseases, isolation is associated with unintentional consequences experienced by both patients and clinicians (Purssell et al., 2020).

Isolation and COVID-19

Isolation is an established method to prevent the transmission of highly contagious diseases or serious infections, like COVID-19 (Purssell et al., 2020). Isolation for COVID-19 includes utilization of personal protective equipment (PPE) like protective gowns, gloves, facemasks (e.g. surgical masks and respirators), eye protection, and oftentimes single-occupancy patient rooms with limited visiting privileges from family or loved ones (Hanlon & Inouye, 2020; Hatmi, 2020; Purssell et al., 2020). While isolation is intended as a protective measure for patients, clinicians, and the population, it has been associated with psychological and non-psychological events experienced by patients like increased rates of depression, anxiety,

dissatisfaction, falls, and delirium (Purssell et al., 2020). Isolation has also been associated with an increase in adverse events like procedure, medication, and diagnostic errors (Purssell et al., 2020). The use of isolation for the containment and treatment of COVID-19 in hospitalized, critically ill patients is a necessity, however it appears to be associated with problems like missed assessments, diagnoses, and may contribute to issues experienced by patients like delirium.

Delirium

Delirium is an acute confusional state characterized by a disruption of attention and cognition, and has been most associated with hospitalization, critical illness, use of physical restraints, indwelling lines or catheters, immobilization, sedative medications, and is most often seen in older adult patients (Inouye et al., 1999). Hallmark signs and symptoms of delirium include increased vigilance, deficits in attention, increased tremulousness, agitation, confusion, disorientation, hallucinations, stupor, and catatonia (Francis, 2014). The incidence of delirium can vary based on care areas, with rates at 10% in general medical surgical units and up to 81.3% in medical intensive care units (ICUs) (Maldonado, 2008). Delirium is associated with increased mortality rates, prolonged hospitalization, increased ICU length of stay, and prolonged cognitive dysfunction after hospitalization (Maldonado, 2008). It is estimated that the majority of delirium cases go undetected among ICU patients (Zaal & Slooter, 2012). Past surveys of medical and nursing staff on delirium have shown that these clinicians feel that delirium is under assessed and ubiquitous in their care areas despite the availability of validated screening tools (Elliot 2014; Oxenbøll-Collet, et al., 2016).

Barriers to Delirium Recognition and Assessment

Current estimates of missed cases of delirium are as high as 75% (Zaal & Slooter, 2012). Critical care nurses and physicians consider delirium an important issue, but feel that it is under-

assessed and mismanaged (Oxenbøll-Collet et al. 2016). Validated delirium assessment tools are widely available for use; however, these tools remain underutilized (Zaal & Slooter, 2012). A gap in the understanding of delirium is that there appear to be barriers to delirium recognition and assessment among critical care professions outside of a research context. Currently, the breadth of understanding regarding the barriers to delirium screening is limited to a small number of surveys of critical care clinicians (Rowley-Conwy, 2018). Many of these surveys had low response rates or limited focus on nurses and physicians (Rowley-Conwy, 2018).

The COVID-19 Pandemic and Delirium

Early research conducted on COVID-19 and delirium suggests that delirium may occur in hospitalized patients with COVID-19 at rates from 25% to 33% and at 65% in ICU patients (Kennedy et al., 2020). Past research estimates the incidence of delirium among ICU patients as high as 80%, though many cases of delirium are possibly missed (Maldonado, 2008; Zaal & Slooter, 2012). Patients with COVID-19 and delirium also have worse outcomes like ICU admission and in-hospital death, than patients without delirium (Kennedy et al., 2020). COVID-19 may be associated with increased rates of delirium in older adults. Prior to the COVID-19 pandemic, delirium was under-recognized and under-assessed in older adult patients (Oxenbøll-Collet et al. 2016). The increase in high acuity hospitalized patients as a result of the pandemic, the use of isolation for patients experiencing symptoms of coronavirus disease, the potentially high rates of delirium among patients with COVID-19, and the existing issue of delirium under-recognition and assessment are a confluence of problems. There is currently a gap in the literature regarding the barriers to delirium recognition and assessment among critical care clinicians during the COVID-19 pandemic.

Conceptual Framework

The Assessment of Quality of Care framework was utilized in order to elaborate on the barriers to delirium recognition and assessment and the influence of the COVID-19 pandemic on these practices (Donabedian, 1988). The framework is divided into three domains: structure, process, and outcomes, each containing features that can influence the other domains (Donabedian, 1988). Structure describes the physical attributes of the settings where care occurs which includes the material resources and human resources of the setting (Donabedian, 1988). Process describes the action in giving and receiving care, or the clinician's activities in assessing, diagnosing, or implementing treatment (Donabedian, 1988). Outcomes is centered on the effects of care on the health status of the patient or population as well as the satisfaction of the experiences by the clinician (Donabedian, 1988). This framework can be used as a method to summarize abstract problems. The majority of the issues addressed by this study lie within the process domain as the barriers to delirium recognition and assessment and the COVID-19 pandemic both impact the clinicians' ability to perform delirium assessments and prioritize delirium recognition among patients.

Methods

Objective

The purpose of this study was to examine the barriers to delirium recognition and assessment among critical care clinicians during the COVID-19 pandemic utilizing a survey of clinicians.

Aims

The aims of this study were to describe and compare the differences between critical care clinicians (physical therapists [PTs], physical therapy aides [PTAs], physicians, registered nurses

[RNs], and respiratory therapists [RTs]) in the roles, responsibilities, and perceived barriers to delirium recognition and assessment and to explore the impact of the COVID-19 pandemic on the delirium recognition and assessment practices of critical care clinicians.

Study design

This was a cross-sectional multi-methods study that utilized the "Nursing Practices and Perceptions Towards Delirium in the Intensive Care Unit" survey for the quantitative part of the study, which was a previously validated survey developed by Devlin et al. (2008). The survey contained nine questions focused on delirium assessment practices and ten demographic questions. The survey was originally distributed exclusively to RNs (Devlin et al., 2008). Permission to utilize the survey for this study was obtained from the survey's author. Additional items centered on distress associated with delirium, preferences of which clinicians should assess for delirium, and COVID-19 were generated and added to the survey. Portions of items regarding sedation, an alcohol withdrawal scale, and a delirium assessment tool not used within the study site were not included as they were not relevant for the participating clinicians. The survey was dispensed to a pilot group of health professions consisting of five RNs, three RTs, and one physician to test face validity of the survey. After the pilot phase, the survey was distributed to a convenience sample of respondents via email and advertisement posters.

Setting

This study was performed at a large, academic hospital situated in a metropolitan area of Northern California. The study setting had multiple adult specialty ICUs including medical, surgical, burn, cardiothoracic, cardiac, neurosurgical, and mixed medical-surgical.

Ethical Approval

The institutional review board reviewed and approved the study and deeming it as exempt from full review because it involved low potential risk to participants. All participant data was de-identified, aggregated, and a consent process was followed for all participants.

Participants

All clinicians (PTs, PTAs, physicians, RNs, and RTs) who were English-speaking and worked in the adult ICUs at least 51% of their time on-site for at least six months were invited to participate. Staff who worked in settings other than adult ICUs (e.g. pediatric specialties and wards), who worked less than 51% (part-time or per diem), who worked on-site for less than six months, or who did not provide direct patient care within the capacity of bundled delirium prevention and management strategies were excluded from this study (Ely, 2017). About 600 clinicians were eligible to participate. All eligible participants were contacted via email listserv; volunteer sampling was utilized for this study.

Hypotheses and Variables

This study had several hypotheses. The first hypothesis was that different types of delirium assessments were provided at distinct frequencies during a work shift and would vary by clinician type. The second was that perceived barriers to delirium recognition and assessment would differ by clinician type. The third hypothesis was that the perceived barriers to delirium recognition and assessment imposed by the COVID-19 pandemic would be different based on clinician type.

Differences between Clinicians

In the analysis of barriers to delirium recognition and assessment, multiple dependent variables were examined. Dependent variables were categorized into separate groups: delirium

assessment responsibility and frequency, type and frequency of delirium assessment used during a 12-hour shift, barriers to delirium assessment, and delirium assessment among clinicians caring for patients with COVID-19. The primary independent variable was clinician role or type which was disclosed by respondents through the survey. PTs and PTAs were combined into a single clinician group due to similarities in roles and the low response rate in both clinician groups. Participants also provided responses in just one or two response categories and the number of specific clinician participants were low, so responses were compressed into two or three categories to permit comparison between clinician types.

Logistic Regression

Clinicians were dichotomized into RNs versus all other clinician categories representing the independent variables to conduct a logistic regression analysis to determine differences between clinician types. The predictor variables were clinician types, divided into RNs and other health profession categories. The response variables were frequency of delirium assessment, type of delirium assessment used, agreement with barriers, rating of distress levels, and rating of barriers related to delirium and COVID-19. Odds ratios were calculated to examine the strength of association of RNs' frequency of delirium assessment, type of assessment, agreement or disagreement with barriers, distress ratings, and ratings of barriers related to delirium and COVID-19 compared to other health professions. This dichotomization of health professions was necessary due to the low response rate of the clinicians other than RNs. Responses to delirium screening frequency were dichotomized into never (never and rarely coded as the reference group) versus frequently/always (frequently and always) categories. Assessment type and frequency during a 12-hour shift responses were dichotomized into never (never heard of, never use, and rarely coded as the reference group) versus once or more (x1, x2-3, x4-6, and >x6)

categories. All responses regarding barriers to delirium assessment, distress, and COVID-19 were ratings on a 5-point scale. Responses to barriers to assessment were dichotomized as disagree (strongly disagree and somewhat disagree coded as the reference group) versus agree (neither agree nor disagree, somewhat agree, and strongly agree). Responses to ratings on distress when caring for a patient with delirium were dichotomized as not distressing (not distressing and slightly distressing coded as the reference group) versus distressing (moderately distressing, very distressing, and extremely distressing). Responses regarding importance of assessing for delirium, prioritization of delirium assessments, interference with assessments, and distress levels with delirium among patients with COVID-19 were dichotomized as not at all (not at all, slightly, and low coded as the reference group) versus high (moderate, very high, extremely high, and highest). Responses to the 3-point scale question comparing rates of delirium among patients with COVID-19 to other ICU patients were dichotomized as lower than other patients (coded as the reference group) versus higher than other patients (about the same as other patients and higher than other patients).

Procedures

The survey was distributed on the Qualtrics web-based survey platform (Qualtrics, Provo, Utah) to each eligible clinician via an email listserv. Advertisements to participate were posted in unit and department common areas. Reminder messages were also distributed to participants by email and through in-person advertising. An incentive raffle was offered in which three participants chosen at random would receive a nominal prize of a gift card. All associated costs were covered by the primary investigator of this study.

Data Analysis

Survey data were exported to a Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, Washington) for data cleaning. Responses were analyzed using StataIC version 16.1 (StataCorp, College Station, Texas). Variables were reported using summary statistics. Fisher's exact test and logistic regression were used to study associations between categorical variables and model RN versus other clinician respondents' reported frequency of delirium assessments, types of assessments used, agreement with barriers to delirium assessment, rating of distress associated with caring for patients with delirium, barriers to delirium assessment among patients with COVID-19, rating of distress associated with caring for patients with delirium and COVID-19, and rates of delirium among patients with COVID-19 compared to other ICU patients. Fisher's exact test was used when comparing between clinicians because respondents provided five or fewer replies to certain items. A p-value <0.05 was considered significant.

Results

Respondent Characteristics

The survey was distributed to a total of 611 clinicians, of which a volunteer sample of 114 (18.7%) responded. The majority of respondents were RNs (74.6%), most identified as female (77%), between 25-44 years old (74.6%), and as Caucasian/white (67.5%). Almost half of the respondents indicated that they had between two to nine years of experience in the ICU (49.1%), 55.3% had a Bachelor's Degree, and 41.2% worked most of their time in the Medical ICU or rotated through units. Most (88.6%) of the clinicians reported that they had previously cared for a patient with COVID-19. Demographic characteristics of the respondents can be found in Table 1.

Delirium Assessment Responsibility and Frequency

The majority of clinicians felt that the responsibility for providing delirium assessments should be shared among all clinicians, rather than one specific clinician type. While this finding was not statistically significant, the responses do provide a descriptive summary of responses and support the notion that there was not a large difference of opinions among the respondents. Table 2 shows the respondents' opinions of which clinicians should be responsible for providing assessments and the delirium screening characteristics utilized by clinicians. When asked if there were designated delirium screening procedures, 80% of PTs/PTAs, 71.4% of physicians, 96.5% of RNs, and 25% of RTs (p=<0.001) stated that they were aware of a screening procedure. When asked about awareness of a specific frequency of providing delirium assessments 30% of PTs/PTAs, 28.6% of physicians, 70.2% of RNs, and 16.7% of RTs (p=0.001) stated that they were aware of a specified frequency. All clinician types, with the exception of RTs, stated that they evaluated for delirium frequently or always (p<0.001) indicating a difference in delirium assessment frequency between health professions. When asked to specify delirium assessment frequency during a 12-hour shift, most respondents replied with at least once to more than once per shift (p<0.001). These responses indicated that there was also a difference between health professions on the frequency of delirium assessments provided within a shift.

Delirium Assessment Type

RNs indicated utilizing patients' ability to follow commands, orientation level, and agitation related events/Richmond Agitation Sedation Scale (RASS) with higher frequencies (more than once per 12-hour shift) compared to other profession groups. Over half of RNs (48, 56.5%, p<0.001) indicated that they utilized the Confusion Assessment Methods-ICU (CAM-ICU) delirium assessment tool once per 12-hour shift while the majorities of other health

professions indicated that they either had never heard of, never used, or rarely used the CAM-ICU for delirium assessment. Additional information regarding the type of delirium assessment used during a 12-hour shift is shown in Table 3.

Barriers to Delirium Assessment

Table 4 contains information regarding the clinicians' perceived barriers to delirium assessment. Most of the RNs strongly or somewhat disagreed with the statements of not feeling confident with using delirium assessment tools (58.8%, p=0.001), inability to adequately document delirium assessments (65.9%, p=0.001), not having enough time to perform assessments (54.1%, p=0.019), not being required to screen for delirium (92.9%, p<0.001), and other clinicians already completing delirium assessments (63.5%, p<0.001).

The following comparisons of clinician responses were not statistically significant; however, the responses did provide a descriptive summary of their differences based on clinician type.

Complexity of Tools and use among Intubated Patients

Most of the PTs/PTAs and RNs strongly or somewhat disagreed that delirium tools were too complex to use. RNs and RTs were either neutral or strongly agreed that assessment tools were difficult to interpret in intubated patients.

Use of Assessment Findings

Both RNs and RTs somewhat or strongly agreed with the statement that other clinicians did not use their assessment in their decision making. Physicians disagreed indicating that they felt that their assessments were used in other clinicians' decision making.

Delirium in the ICU

Many of the clinicians neither agreed nor disagreed that delirium was an under-assessed problem. Most of the PTs/PTAs, physicians, and RNs somewhat or strongly agreed that delirium was a common response in the ICU environment. The majorities of physicians and RNs stated that they were neutral regarding the statement that delirium was challenging to assess in ICU patients.

Interference and Distress from Delirium

Most PTs/PTAs, physicians, and RNs neither agreed nor disagreed when asked whether the presence of delirium interfered with the ability to provide patient care. Most PTs/PTAs, RNs, and RTs were neutral when asked if the presence of delirium increased their workload while most physicians somewhat or strongly agreed with this statement. When asked to rate distress levels when caring for a patient experiencing delirium most physicians, RNs, and RTs responded that the experience was very to extremely distressing while nearly all PTs/PTAs responded that the experience was not at all to slightly distressing.

Delirium Assessment and COVID-19

Most PTs/PTAs and RNs replied that assessing for delirium among patients with COVID-19 was very important and most physicians and RTs replied that delirium assessments were not at all to somewhat important, though these findings were not statistically significant. Regarding prioritization of delirium assessment and interventions over other types of assessment and interventions among suspected or confirmed COVID-19 patients, most of the physicians and RTs rated delirium assessments as not a priority to low priority (p=0.026), PTs/PTAs rated delirium assessments as moderate priority, and RNs provided a plurality of responses as both not a priority and moderate priority. Many of the comparisons of clinician responses regarding

perceptions of delirium and COVID-19 were not statistically significant; however, the responses do provide a descriptive summary of responses based on clinician type. There was variability within and between health professions' responses regarding interference with providing delirium assessments and experiencing distress when encountering patients with suspected or confirmed COVID-19. When asked to compare rates of delirium between patients with COVID-19 and other ICU patients, most clinicians responded that they felt the frequency of delirium was about the same. Table 5 contains descriptive information regarding delirium assessment among clinicians caring for patients with COVID-19.

Comparisons between RNs and All Other clinicians

RNs were more likely to state that they provide delirium assessments frequently or always (OR=29.3; $p<0.001$) compared to other clinicians. RNs also reported that they use the patient's ability to follow commands (OR=17.5; $p=0.011$) and the CAM-ICU (OR=126.7; $p<0.001$) at least once during a 12-hour shift compared to other clinicians.

Compared to other clinicians, RNs were more likely to feel confident in their ability to use delirium assessment tools (OR=0.22; $p=0.002$), were able to adequately document their delirium assessments (OR=0.23; $p=0.002$), were required to screen for delirium in their ICU/care area (OR=0.02; $p<0.001$), and that other clinicians do not already complete delirium assessments (OR=0.092; $p<0.001$). RNs were also more likely to report that caring for patients with delirium was moderately to extremely distressing (OR=2.83; $p=0.023$).

RNs were more likely than other clinicians to rate assessing for delirium among COVID-19 patients as moderately to extremely important (OR=3.65; $p=0.011$), were more likely to rate prioritization for assessing for delirium as moderate to the highest priority (OR=2.58; $p=0.04$), and were more likely to rate interference with delirium assessment as moderate interference to

totally interfered with (OR=2.48; p=0.048). Table 6 contains further information comparing RNs to other clinicians.

Discussion

To the authors' knowledge, this study was the first to assess the barriers to delirium recognition and assessment across multiple professions during the COVID-19 pandemic. This study supports the notion that critical care clinicians differ in their approaches to recognizing and assessing for delirium in addition to having different perceived barriers to delirium assessment. In general, all clinician groups indicated that the handling of delirium assessments should be a collaborative effort between all clinicians, instead of a single or select profession type. Shared agency and responsibility among different professions for delirium assessment aligns with current delirium prevention and management strategies and delirium care bundles (Ely, 2017).

Differences Between Professions

Delirium Assessment Type

RNs indicated that they utilized the CAM-ICU at least once per 12-hour shift, while the majority of other professions indicated that they did not, and instead opted for other non-validated methods like the ability to follow commands or assessing orientation level. RNs also stated that they utilized non-validated methods more frequently than the CAM-ICU when evaluating for delirium. Per facility policy, RNs were tasked with performing and documenting the CAM-ICU, while other clinicians were not. The CAM-ICU is a highly accurate delirium assessment tool, but must be utilized routinely in order to detect manifestations of delirium (Gusmao-Flores et al., 2012). Psychiatric evaluation remains the "gold standard" for delirium diagnosis; however, it is impractical to ensure that trained psychiatric evaluation occurs on a routine basis among all ICU patients who are at risk for developing delirium (Moldanado, 2008).

The CAM-ICU was developed and validated against expert psychiatric opinions for use among non-psychiatric clinicians for routine delirium screening (Moldanado, 2008).

Perceived Barriers to Assessment

Most professions in this study moderately to strongly agreed that delirium was challenging to assess, delirium assessment tools were too complex to use, and delirium assessment tools were difficult to interpret in intubated patients. However, the CAM-ICU was developed for and extensively validated among non-verbal, intubated ICU patients (Rowley-Conwy, 2018). These perceptions concerning the complexity of delirium assessment tools are consistent with other research focused on barriers to delirium assessment, and appear to be commonly held by clinicians (Devlin et al., 2008; Oxenbøll-Collet, et al., 2016; Rowley-Conwy, 2018). These responses to questions regarding challenges and perceived complexities with the use of validated delirium assessment tools may indicate the need for further practice with these tools among patients by all professions.

Delirium Assessment Responsibility

The majority of respondents felt that all clinicians should be responsible for providing delirium assessments. While these findings were not statistically significant, these responses could have indicated a desire to share the responsibility, rather than keeping it with a select health profession type. RNs and physicians agreed that they were required to screen for delirium and that other professions did not perform delirium assessments. Other professions responded in alignment in that they did not feel that they were required to perform screening and that it was performed by other clinicians. This indicated that RNs and physicians felt responsible for providing delirium assessments and other professions were not part of this process. RNs were required to perform and document delirium assessments at least once per shift per facility policy.

Physicians, however, were not required to perform or document delirium assessments. Most health professionals except for physicians also shared moderate to strong agreement with the question regarding other clinicians (peers or other professions) not using their assessments in decision-making. This response could indicate a lack of buy-in about delirium assessments from certain professions or insubstantial communication between clinicians. Clinicians might be performing delirium assessments as a policy requirement but may not trust or use the results of validated tools or other clinicians' assessments, or they might feel that communicating the results are futile, which have been recognized and reported barriers to successful delirium recognition in other studies (Oxenbøll-Collet, et al., 2016; Rowley-Conwy, 2018).

Clinicians' Understanding of Delirium

The majority of clinicians agreed with the idea that use of delirium assessment tools improved patient outcomes and disagreed that patients with delirium were rarely agitated, while most shared moderate to strong agreement that delirium was an under-assessed problem, was a common response to the ICU environment, was challenging to assess, and was associated with higher patient mortality. The clinicians' agreement with using delirium assessments to improve patient outcomes indicates a shared understanding of the benefits of assessing for delirium and the problem of delirium in general. The respondents' agreement with the statements regarding the issues of delirium being under-assessed, that it is common in the ICU, that it is challenging to assess, and associated with higher mortality also indicates a general understanding of the problems and consequences associated with delirium. Almost all respondents disagreed that patients with delirium rarely present with agitation. The fact that most health professions disagreed with this statement may indicate a misunderstanding of the presentation of delirium as it mostly manifests in patients as hypoactive or mixed delirium and not hyperactive delirium, and

therefore they may benefit from additional education and practice with recognition of delirium in order to improve general knowledge of delirium (Devlin et al., 2008; Elliot, 2014; Moldonado, 2008).

Barriers to Providing and Documenting Assessments

With the exception of RTs, the other professions indicated moderate to strong confidence in their ability to use delirium assessment tools, adequately documenting delirium assessments, and having time to perform assessments. Delirium assessment tools were developed to be rapidly and simply performed (Devlin et al., 2008; Elliot, 2014). These responses differed from other studies in that many clinicians reported not having confidence in using delirium assessment tools, that they were too complicated to use, or they did not have enough time to perform them and document their results (Rowley-Conwy, 2017). This may also indicate that the clinicians did not view lack of confidence, ability to document findings, and inadequate time as barriers to delirium assessment. However, most professions also indicated that they do not routinely use validated delirium assessment tools, instead opting for non-validated methods.

Interference and Distress from Delirium

Almost all professions indicated that they felt delirium interfered with providing care and increased their workload. Most clinicians, with the exception of PTs/PTAs, also indicated moderate to high levels of distress when caring for patients experiencing delirium. A possible explanation for PTs/PTAs not endorsing higher levels of distress could have been due decreased exposure to patients experiencing delirium. Patients experiencing delirium may not be able to cooperate during physical therapy sessions or they could present safety risks to themselves or clinicians which preclude them from physical therapy. The authors of one study found that patients experiencing delirium were less likely to participate in physical therapy, but the current

understanding of this issue is limited (Kamdar et al., 2016). These findings from the other health professions were similar to other studies in that clinicians indicated that the presence of delirium interfered with providing care, increased workload, and the perceptual disturbances and threats to safety associated with delirium were all sources of distress (O'Malley et al., 2008).

COVID-19 and Delirium

Assessing for delirium among patients with COVID-19 was of moderate to high importance for most health professions in this study. These replies were similar to the responses in this study by clinicians regarding general delirium practices and perceptions. RTs rated delirium assessments among COVID-19 patients as being less important than other types of assessments or interventions. This could be due to their primary role of providing respiratory care to patients, particularly those suffering from COVID-19. All professions rated delirium assessment among patients with COVID-19 as a low to moderate priority. This could be attributed to the severity of illness of patients suffering from COVID-19. Delirium assessments have been reported as not a priority to perform, particularly among critically ill patients according to a review of barriers to delirium assessments (Rowley-Conwy, 2017). The rating of moderate to high levels of interference with delirium assessments could be attributed to the necessity of isolation precautions and PPE for patients with COVID-19, which can limit the amount of time spent at the bedside and can interfere with communicating with patients (Hanlon & Inouye, 2020; Purssell et al., 2020). The severity of illness among COVID-19 patients and the necessity of utilizing PPE and isolation among clinicians could have deprioritized providing delirium assessments and led to the perceptions of interference with providing assessments and care. Most professions responded that rates of delirium among patients with COVID-19 were about the same when compared to all of other ICU patients. In other words, the respondents did

not feel that rates of delirium were different between ICU patients with and without COVID-19. The current understanding of the association between COVID-19 and risk for delirium are not yet fully understood; however, other studies have found an increased risk for delirium among critically-ill, older adult patients with respiratory illness (Hanlon & Inouye, 2020).

With the exceptions of PTs/PTAs, most professions indicated feeling moderate to extreme levels of distress when caring for patients with COVID-19 experiencing delirium. At present, there is limited understanding of distress experienced by health professions related to COVID-19 and delirium. However, there is an association between feelings of distress by clinicians when caring for critically ill patients experiencing delirium (O'Malley et al., 2008; Rowley-Conwy, 2018). Early research has indicated that clinicians experience high levels of distress while caring for critically-ill patients with COVID-19 (Vizheh et al., 2020). The survey respondents' increased feelings of distress could be attributed to the severity of illness and high risk of mortality associated with COVID-19 in addition to the associated distress with patients experiencing delirium (CDC, 2021; O'Malley et al., 2008; Rowley-Conwy, 2018; Vizheh et al., 2020).

Strengths and Limitations

The strengths of this study are the inclusion of additional health professions in examining the barriers to delirium recognition and assessment; previous studies centered on barriers to delirium recognition and assessment have focused on perspectives from RNs and physicians (Devlin et al., 2008; Elliot, 2014; Oxenbøll-Collet, 2016; Rowley-Conwy, 2018). Additionally, this is one of the first studies to examine the impact of the COVID-19 pandemic on clinicians' ability to recognize and assess for delirium. PTs, PTAs, and RTs were included in this study as these clinicians are responsible for key aspects of delirium prevention and management, like

early mobility and ventilator liberation (Ely, 2017). These additional professions may also be able to aid with the detection or recognition of delirium during their interactions with patients. Delirium is a problem that requires collaborative efforts for its prevention and management, so gaining the perspectives of multiple types of clinicians will help to expand the understanding of how to better overcome the barriers to delirium recognition and assessment. The timing of this study during the COVID-19 pandemic provided a unique opportunity to understand the influence of the pandemic on the delirium assessment practices of critical care clinicians. Clinicians were able to participate in this study during the pandemic, rather than having to recall or remember practices at a later time.

There were several limitations imposed on this study. The survey response rate was 18%, which is less than similar studies (Devlin et al., 2008; Elliot, 2014). This low response rate is attributed to the timing of the release of the survey, which occurred during a regional increase in COVID-19 related hospitalizations. The survey was released a second time during a plateau in COVID-19 related hospitalizations and saw a modest increase in responses; however shortly thereafter, hospitalizations saw a rapid increase in the volume and acuity of COVID-19 patients which likely interfered with the clinicians' ability to take the survey. This study was performed with clinicians at a single, academic hospital, which may not be generalizable to other hospitals. The sample was obtained using volunteer sampling, which may affect the generalizability of the results of this study. The responses were self-reported and not validated with clinician practice, so the findings model an assessment of education needs similar to the initial study utilizing this survey tool performed by Devlin et al. (2008).

Implications for future practice

There are several implications for future practice. In order to overcome the barriers to using validated delirium tools routinely, clinicians should be provided with continuing education on the appropriate use of validated delirium assessment tools including practice with nonverbal or intubated patients. Current estimates indicate rates of delirium as high as 81.3% in medical ICUs and cases of missed delirium diagnoses as high as 75% (Maldonado, 2008; Zaal & Slooter, 2012). Despite implementing delirium screening policy and providing some education for RNs, delirium and its sequelae persist as common problems for hospitalized patients. Including other professions in addition to RNs with routine delirium education and performing delirium assessments will help to increase overall awareness of the problem of delirium and the rates of early delirium detection. Implementing changes with institutional guidelines and policies to include additional clinicians can support interprofessional communication. Changes in institutional delirium recognition and assessment guidelines would help support clinicians' use of delirium assessments, contribute to interprofessional communication and buy-in, and increase the agency to prioritize delirium assessment among clinicians (Law et al., 2012; Oxenbøll-Collet, et al., 2016; Rowley-Conwy, 2017). These changes could help to increase the rate by which delirium is detected and reduce the number of missed or overlooked cases, and overall help to improve patient outcomes.

Conclusion

Physicians, PTs/PTAs, RNs, and RTs indicated several barriers to delirium recognition and assessment including using non-validated delirium assessment methods, perceiving difficulty with assessing delirium in intubated patients, and feeling that other clinicians do not use delirium assessment results. The need for isolation and PPE during the COVID-19 pandemic interfered

with clinicians' ability to recognize delirium and deprioritized delirium assessments. Delirium remains a pernicious issue for hospitalized patients leading to serious consequences including prolonged hospitalization, long-term cognitive dysfunction, and increased risk of death. The presence of the COVID-19 pandemic appears to have exacerbated the issue of missing cases of delirium due to the influx of high acuity patients and low prioritization of assessing for delirium. Critical care clinicians would benefit from increased institutional support and the implementation of collaborative delirium assessment and management practices to better address the problem of delirium.

Declaration of Competing Interest

Conflicts of interest: none.

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Tables and Graphs

Table 1

Respondent Demographic Characteristics (N=114)

Characteristic		Total	%
Gender	Male	26	23
	Female	87	77
Age (years)	18-34	45	39.5
	35-44	41	36
	45-54	20	17.5
	55-64	8	7
Ethnicity	Caucasian/White	77	67.5
	Asian	27	23.7
	Hispanic/Latinx	3	2.6
	Native American or Alaskan Native	1	0.9
	Native Hawaiian or Pacific Islander	2	1.8
	Other	4	3.5
Current Role in the ICU	Registered Nurse	85	74.6
	Respiratory Therapist	12	10.5
	Physical Therapist	9	7.9
	Physician-Resident	7	6.1
	Physical Therapist Assistant	1	0.9
Length of Time in Current Role	6 months to 2 years	9	7.9
	2 to 4 years	23	20.2
	5 to 9 years	33	29
	10 to 15 years	21	18.4
	16 to 20 years	15	13.1
	20 or more years	13	11.4
Degree	Associate's Degree	11	9.7
	Bachelor's Degree	63	55.3
	Master's Degree	29	25.4
	MD/DO	7	6.1
	Other Doctorate	4	3.5
Main ICU or Specialty	Burn ICU	11	9.7
	Cardiac ICU	4	3.5
	Cardiothoracic ICU	12	10.5
	Medical ICU	26	22.8
	Medical Surgical ICU	18	15.8
	Neurosurgical ICU	6	5.3
	Surgical ICU	16	14
	Variable/Float	21	18.4
Cared for a patient with COVID-19	Yes	101	88.6
	No	13	11.4

Note. ICU, intensive care unit; MD, Doctor of Medicine; DO, Doctor of Osteopathy; COVID-19, coronavirus disease 2019

Table 2

Delirium Assessment Responsibility and Frequency by Clinician Role (N=114)

	n (%)				
	Physical Therapists/PTAs (n=10)	Physicians (n=7)	Registered Nurses (n=85)	Respiratory Therapists (n=12)	p Value
Who should be responsible for delirium assessments?					0.692
Physicians	0 (0)	1 (14.3)	3 (3.5)	0 (0)	
Registered Nurses	3 (30)	2 (28.6)	18 (21.2)	4 (33.3)	
All Clinicians	7 (70)	4 (57.1)	63 (74.1)	8 (66.7)	
Not Sure	0 (0)	0 (0)	1 (1.2)	0 (0)	
Does your care area have a delirium screening procedure?					<0.001
Yes	8 (80)	5 (71.4)	82 (96.5)	3 (25)	
No/Not Sure	2 (20)	2 (28.6)	3 (3.5)	9 (75)	
Does your delirium screening procedure specify a frequency?					<0.001
Yes	3 (30)	2 (28.6)	59 (70.2)	2 (16.7)	
No/Not Sure	7 (70)	5 (71.4)	25 (29.8)	10 (83.3)	
How often do you evaluate for delirium?					<0.001
Never/Rarely	2 (20)	1 (14.3)	2 (2.3)	9 (75)	
Frequently/Always	8 (80)	6 (85.7)	83 (97.7)	3 (25)	
How often do you evaluate for delirium during a 12-hour shift?					<0.001
Never	1 (11.1)	0 (0)	0 (0)	4 (33.3)	
x1	9 (88.9)	6 (85.7)	29 (34.1)	5 (41.7)	
>x1	0 (0)	1 (14.3)	56 (65.9)	3 (25)	

Note. PTAs, Physical Therapist Assistant

Table 3

Type of Delirium Assessment Used During a 12-hour Shift (N=114)

n (%)

	Physical Therapists/PTAs (n=10)	Physicians (n=7)	Registered Nurses (n=85)	Respiratory Therapists (n=12)	p Value
Ability to follow commands					<0.001
Never Heard Of/Never Use/Rarely Use	1 (10)	0 (0)	1 (1.2)	4 (33.3)[a]	
x1	5 (50)	6 (85.7)	1 (1.2)	4 (33.3)[a]	
>x1	4 (40)	1 (14.3)	83 (97.5)	4 (33.3)[a]	
Evaluate orientation level					<0.001
Never Heard Of/Never Use/Rarely Use	1 (10)	0 (0)	0 (0)	5 (41.7)	
x1	7 (70)	4 (57.1)	3 (3.5)	3 (25)	
>x1	2 (20)	3 (42.9)	82 (96.5)	4 (33.3)	
CAM-ICU					<0.001
Never Heard Of/Never Use/Rarely Use	8 (80)	5 (71.4)	4 (4.7)	12 (100)	
x1	2 (20)	2 (28.6)	48 (56.5)	0 (0)	
>x1	0 (0)	0 (0)	33 (38.8)	0 (0)	
Psychiatry consult					0.797
Never Heard Of/Never Use/Rarely Use	9 (90)	7 (100)	68 (80)	12 (100)	
x1	1 (10)	0 (0)	11 (12.9)	0 (0)	
>x1	0 (0)	0 (0)	6 (7.1)	0 (0)	
Agitation related events/RASS					<0.001
Never Heard Of/Never Use/Rarely Use	8 (80)	3 (42.9)	0 (0)	10 (83.4)	
x1	2 (20)	3 (42.9)	3 (3.5)	1 (8.3)	
>x1	0 (0)	1 (14.2)	82 (96.5)	1 (8.3)	

Note. PTAs, Physical Therapist Assistant; CAM-ICU, Confusion Assessment Methods-ICU; RASS, Richmond Agitation Sedation Scale

[a]Percentages may not total 100 due to rounding.

Table 4

Barriers to Delirium Assessment Among Clinicians (N=114)

	n (%)				
	Physical Therapists/PTAs (n=10)	Physicians (n=7)	Registered Nurses (n=85)	Respiratory Therapists (n=12)	p Value
Delirium tools are too complex to use.					0.163
Strongly/Somewhat Disagree	5 (50)	2 (28.5)	37 (43.5)	2 (16.7)	
Neither Agree Nor Disagree	1 (10)	2 (28.5)	25 (29.4)	2 (16.7)	
Somewhat/Strongly Agree	4 (40)	3 (43)	23 (27.1)	8 (66.6)	
Assessment tools are difficult to interpret in intubated patients.					0.802
Strongly/Somewhat Disagree	3 (30)	2 (28.6)	13 (15.3)	2 (16.6)	
Neither Agree Nor Disagree	5 (50)	3 (42.9)	41 (48.2)	5 (41.7)	
Somewhat/Strongly Agree	2 (20)	2 (28.5)	31 (36.5)	5 (41.7)	
I do not feel confident in my ability to use delirium assessment tools.					0.001
Strongly/Somewhat Disagree	5 (50)	2 (28.5)	50 (58.8)	0 (0)	
Neither Agree Nor Disagree	2 (20)	3 (43)	12 (14.1)	5 (41.7)	
Somewhat/Strongly Agree	3 (30)	2 (28.5)	23 (27.1)	7 (58.3)	
I do not feel that using delirium assessment tools improves outcomes.					0.421
Strongly/Somewhat Disagree	8 (80)	3 (42.9)	46 (54.1)	7 (58.3)	
Neither Agree Nor Disagree	1 (10)	1 (14.2)	15 (17.7)	0 (0)	
Somewhat/Strongly Agree	1 (10)	3 (42.9)	24 (28.2)	5 (41.7)	
I am unable to adequately document delirium assessments.					<0.001
Strongly/Somewhat Disagree	5 (50)	4 (57.1)	56 (65.9)	0 (0)	
Neither Agree Nor Disagree	2 (20)	1 (14.3)	16 (18.8)	1 (8.3)	
Somewhat/Strongly Agree	3 (30)	2 (28.6)	13 (15.3)	11 (91.7)	

Table 4 (continued).

Not enough time to perform assessment (too time consuming).					0.019
Strongly/Somewhat Disagree	6 (60)	4 (57.1)	46 (54.1)	3 (25)	
Neither Agree Nor Disagree	3 (30)	3 (42.9)	13 (15.3)	1 (8.3)	
Somewhat/Strongly Agree	1 (10)	0 (0)	26 (30.6)	8 (66.7)	
I am not required to screen for delirium in my ICU/care area.					<0.001
Strongly/Somewhat Disagree	0 (0)	5 (71.4)	79 (92.9)	1 (8.3)	
Neither Agree Nor Disagree	5 (50)	2 (28.6)	1 (1.2)	3 (25)	
Somewhat/Strongly Agree	5 (50)	0 (0)	5 (5.9)	8 (66.7)	
Other clinicians already complete delirium assessments.					<0.001
Strongly/Somewhat Disagree	1 (10)	2 (28.6)	54 (63.5)	1 (8.3)	
Neither Agree Nor Disagree	6 (60)	2 (28.6)	10 (11.8)	1 (8.3)	
Somewhat/Strongly Agree	3 (30)	3 (42.8)	21 (24.7)	10 (83.4)	
Other clinicians do not use my assessment in their decision-making					0.203
Strongly/Somewhat Disagree	4 (40)	6 (85.7)	27 (31.8)	3 (25)	
Neither Agree Nor Disagree	2 (20)	0 (0)	26 (30.6)	3 (25)	
Somewhat/Strongly Agree	4 (40)	1 (14.3)	32 (37.6)	6 (50)	
Delirium is an under-assessed problem.					0.753
Strongly/Somewhat Disagree	0 (0)	0 (0)	12 (14.1)	0 (0)	
Neither Agree Nor Disagree	8 (80)	5 (71.4)	51 (60)	9 (75)	
Somewhat/Strongly Agree	2 (20)	2 (28.6)	22 (25.9)	3 (25)	
Delirium is a common response in the ICU environment.					0.564
Strongly/Somewhat Disagree	0 (0)	0 (0)	3 (3.5)	0 (0)	
Neither Agree Nor Disagree	4 (40)	1 (14.3)	39 (45.9)	7 (58.3)	
Somewhat/Strongly Agree	6 (60)	6 (85.7)	43 (50.6)	5 (41.7)	

Table 4 (continued).

Delirium is challenging to assess in ICU patients.					0.76
Strongly/Somewhat Disagree	1 (10)	2 (28.5)	22 (25.9)	4 (33.3)[a]	
Neither Agree Nor Disagree	3 (30)	3 (43)	35 (41.2)	4 (33.3)[a]	
Somewhat/Strongly Agree	6 (60)	2 (28.5)	28 (32.9)	4 (33.3)[a]	
The presence of delirium interferes with my ability to provide patient care.					0.827
Strongly/Somewhat Disagree	1 (10)	0 (0)	15 (17.7)	2 (16.6)	
Neither Agree Nor Disagree	7 (70)	4 (57.1)	41 (48.2)	5 (41.7)	
Somewhat/Strongly Agree	2 (20)	3 (42.9)	29 (34.1)	5 (41.7)	
The presence of delirium increases my workload.					0.831
Strongly/Somewhat Disagree	1 (10)	0 (0)	6 (7.1)	0 (0)	
Neither Agree Nor Disagree	6 (60)	3 (42.9)	43 (50.6)	8 (66.7)	
Somewhat/Strongly Agree	3 (30)	4 (57.1)	36 (42.3)	4 (33.3)	
Delirium is associated with higher patient mortality.					0.4
Strongly/Somewhat Disagree	0 (0)	0 (0)	4 (4.7)	0 (0)	
Neither Agree Nor Disagree	4 (40)	2 (28.6)	44 (51.8)	3 (25)	
Somewhat/Strongly Agree	6 (60)	5 (71.4)	37 (43.5)	9 (77)	
ICU patients with delirium are rarely agitated.					0.355
Strongly/Somewhat Disagree	6 (60)	4 (57.1)	67 (78.8)	9 (75)	
Neither Agree Nor Disagree	1 (10)	1 (14.3)	6 (7.1)	0 (0)	
Somewhat/Strongly Agree	3 (30)	2 (28.6)	12 (14.1)	3 (25)	
Rating of distress levels when caring for a patient experiencing delirium.					0.136
Not at all/Slightly Distressing	7 (70)	2 (28.6)	19 (22.3)	4 (33.3)	
Moderately Distressing	1 (10)	1 (14.3)	22 (25.9)	3 (25)	
Very/Extremely Distressing	2 (20)	4 (57.1)	44 (51.8)	5 (41.7)	

Note. PTAs, Physical Therapist Assistant; ICU, intensive care unit

[a]Percentages may not total 100 due to rounding.

Table 5

Delirium Assessment Among Clinicians Caring for Patients with COVID-19 (n=101)

n (%)

	Physical Therapists/PTAs (n=10)	Physicians (n=6)	Registered Nurses (n=73)	Respiratory Therapists (n=12)	p Value
Among patients who had either a suspected or confirmed COVID-19 infection please RATE how important it was for you to assess for the presence of delirium.					0.064
Not at all/Somewhat Important	3 (30)	2 (33.3)	11 (15.1)	6 (50)	
Moderately Important	2 (20)	3 (50)	27 (37)	4 (33.3)	
Very/Extremely Important	5 (50)	1 (16.7)	35 (47.9)	2 (16.7)	
Among patients who had either a suspected or confirmed COVID-19 please RATE your prioritization of providing delirium assessments and interventions over other types of assessments and interventions.					0.026
Not a priority/Low Priority	3 (30)	5 (83.3)	30 (41.1)	10 (83.3)	
Moderate Priority	6 (60)	0 (0)	30 (41.1)	2 (16.7)	
High/Highest Priority	1 (10)	1 (16.7)	13 (17.8)	0 (0)	
Among patients who had either a suspected or confirmed COVID-19 please RATE the level by which you felt that your ability to provide delirium assessments and interventions was interfered with.					0.075
Not at all interfered with/Low Interference	6 (60)	1 (14.3)	21 (28.8)	8 (66.6)	
Moderate Interference	2 (20)	2 (28.6)	30 (41.1)	2 (16.7)	
High Interference/Totally interfered with	2 (20)	4 (57.1)	22 (30.1)	2 (16.7)	

Table 5 (continued).

Among patients who were a suspected or confirmed to have COVID-19 AND were experiencing delirium please RATE your level of distress (feelings of stress, worry, or upset) when caring for them.					0.503
Not/Slightly Distressing	5 (50)	2 (28.6)	18 (24.6)	3 (25)	
Moderately Distressing	4 (40)	3 (42.8)	24 (32.9)	4 (33.3)	
Very/Extremely Distressing	1 (10)	2 (28.6)	31 (42.5)	5 (41.7)	
Did patients who either had a suspected or confirmed COVID-19 infection have a higher occurrence of delirium than other ICU patients?					0.835
Less than other patients	1 (10)	0 (0)	6 (8.2)	2 (16.7)	
About the same	8 (80)	7 (100)	56 (76.7)	8 (66.6)	
More than other patients	1 (10)	0 (0)	11 (15.1)	2 (16.7)	

Note. PTAs, Physical Therapist Assistant; COVID-19, coronavirus disease 2019; ICU , intensive care unit

Table 6

Logistic Regression of Delirium Assessment Characteristics Among Registered Nurses and Other Clinicians (N=114)

Characteristic	OR	95% CI	p Value
Frequency of delirium assessment (Ref. Never)	29.3	[6.0, 143]	<0.001
Frequency and type of delirium assessment tool during a 12-hour shift (Ref. Never Heard Of/Never Use/Rarely)			
Evaluate Ability to Follow Commands	17.5	[1.95, 157.1]	0.011
Evaluate Orientation Level	1	-[a]	-[a]
CAM-ICU	126.7	[29.5, 543.1]	<0.001
Psychiatry Consult	7	[0.889, 55.2]	0.065
Agitation Related Events/RASS	1	-[a]	-[a]
Agreement with barriers to delirium recognition and assessment (Ref. Strongly disagree/Somewhat disagree)			
Delirium assessment tools are too complex to use.	0.58	[0.24, 1.43]	0.239
Assessment tools are difficult to interpret in intubated patients.	1.76	[0.63, 4.96]	0.284
I do not feel confident in my ability to use delirium assessment tools.	0.22	[0.086, 0.58]	0.002
I do not feel that using delirium assessment tools improves outcomes.	1.39	[0.59, 3.29]	0.457
I am unable to adequately document delirium assessments.	0.23	[0.094, 0.57]	0.002
Not enough time to perform assessment.	0.69	[0.3, 1.6]	0.388
I am not required to screen for delirium in my ICU/care area.	0.02	[0.0058, 0.067]	<0.001
Other clinicians already complete delirium assessments.	0.092	[0.029, 0.29]	<0.001
Other clinicians do not use my assessment in their decision-making.	1.75	[0.74, 4.14]	0.206
Rating of distress level when caring for a patient with delirium. (Ref. Not Distressing/Slightly Distressing)	2.83	[1.16, 6.89]	0.023

Table 6 (continued).

Clinicians Who Cared for Patients with COVID-19 Sub Group (n=101)			
Rating of importance for assessing for the presence of delirium. (Ref. Not at all Important/Slightly Important)	3.65	[1.35, 9.85]	0.011
Rating of prioritization for assessing for delirium. (Ref. Not a Priority/Low Priority)	2.58	[1.05, 6.36]	0.04
Rating of interference with delirium assessment. (Ref. Not at all interfered with/Low Interference.)	2.48	[1.01, 6.08]	0.048
Rating of distress with delirium and COVID-19. (Ref. Not Distressing/Slightly Distressing)	1.29	[0.48, 3.44]	0.615
Rate of delirium among patients with COVID-19 compared to other ICU patients. (Ref. Lower than other patients)	1.29	[0.3, 5.54]	0.733

Note. OR, odds ratio; CI, confidence interval; CAM-ICU, Confusion Assessment Methods-ICU; RASS, Richmond Agitation Sedation Scale; ICU, intensive care unit; COVID-19, coronavirus disease 2019

[a]Indicates no difference between groups

Appendix B (Manuscript 2)

Interprofessional Perspectives of the Barriers to Delirium Recognition and Assessment During the COVID-19 Pandemic

Abstract

Background: Delirium is a persistent issue among critically ill patients. Existing literature indicates that nurses and physicians encounter barriers to delirium recognition and assessment, though other health professions have not provided their perspectives. Furthermore, the COVID-19 pandemic might have led to additional barriers to delirium recognition and assessment.

Purpose: This study explored the barriers to delirium recognition and assessment among critical care health professions during the COVID-19 pandemic.

Method: Focus groups were performed with physical therapists, registered nurses, and respiratory therapists. Data were analyzed using thematic analysis.

Discussion: Participants indicated that delirium was perceived as a problem among patients but was deprioritized. Clinicians also cited lack of provider buy-in and communication as barriers to delirium recognition. The COVID-19 pandemic further exacerbated these barriers.

Conclusions: Participants indicated a desire for additional delirium education, interprofessional collaborative practices, and institutional support in order to address these barriers to delirium recognition and assessment.

Introduction

Delirium is an acute confusional state characterized by a disruption of attention and cognition typified by disturbances of consciousness, perceptual disturbances (often in the form of hallucinations, delusions, or illusions), attention deficits, increased or decreased psychomotor activity, disordered sleep-wake cycles, and fluctuating presentation most often associated with

hospitalized older adults.[1-2] Delirium is the most common psychiatric syndrome found in the hospital setting and its incidence can vary based on care areas, with rates at 10% in general medical surgical units and up to 81.3% in medical ICUs.[1-2] Delirium is associated with increased mortality rates, prolonged hospitalization, and prolonged cognitive dysfunction after hospitalization.[1-2] It is estimated that the majority of delirium cases go undetected among ICU patients despite its high prevalence.[3] Delirium can result in individual daily healthcare costs ranging from $16,303 to $64,421 and has been estimated to cost $152 billion annually in the United States.[2]

Early recognition and implementing prevention or management strategies are key in mitigating the impact of delirium on patients.[1-4] There are a variety of validated delirium assessment tools and multicomponent prevention and management methods available for use among clinicians; however, these methods may be under-utilized by clinicians due to perceived barriers like disruption in care, lack of time, complexity of assessment tools, or interference with ongoing interventions.[4-6] Routine delirium assessments may also be viewed as a lower priority task by clinicians compared to other types of interventions or assessments due to perceived complexity of delirium assessment tools, lack of familiarity with assessment tools, and unclear implications of positive delirium assessment results.[4-6] Multicomponent delirium management methods that include ventilator liberation, early mobility, mindful medication prescription and administration, and restorative rest have been shown to reduce the risk of developing delirium among patients, however these methods are less likely to be used if clinicians feel that they interfere with other interventions or increase workload.[3]

Other types of necessary or essential interventions might also interfere with delirium recognition and assessment or could contribute to the risk of developing delirium among

patients. For example, isolation and use of personal protective equipment (PPE), which often consists of protective gowns, gloves, face masks, face shields, and respirators, added to a setting with patients in single-occupancy rooms with restricted visitor privileges are essential requirements to prevent the spread of contagious diseases; however, isolation and use of PPE in the hospital setting has been associated with patients experiencing higher rates of anxiety, depression, falls, and delirium.[7-9] The requirement of both isolation and PPE has also been associated with increased rates of missed assessments, diagnostic errors, and medication errors among clinicians.[7]

The severe acute respiratory syndrome coronavirus-2 (COVID-19) global pandemic necessitated the widespread use of isolation and PPE by clinicians to care for hospitalized patients.[9] The COVID-19 pandemic has resulted in 30,277,908 cases and 549,098 fatalities in the United States as of April 2021 and has been associated with a cumulative hospitalization rate of 417.2 per 100,000 in the US as of January 2021.[10-11] As a comparison, the cumulative hospitalization rate for influenza in the US from 2019 to 2020 was 66.1 per 100,000.[12] Adults 65 years and older appear to have a higher risk of COVID-19 associated disease severity, hospitalization, and death compared to other age groups and have accounted for more than 80% of COVID-19 related deaths in the US.[13] Early research focused on COVID-19 and delirium suggests that delirium may occur at rates from 25% to 33% among patients with COVID-19 on medical surgical floors and as high as 65% among patients with COVID-19 in the ICU.[13] Hospitalized patients with COVID-19 and delirium are also at higher risk for ICU admission and in-hospital death compared to COVID-19 patients without delirium.[13]

Current treatment guidelines recommend that patients with COVID-19 should have limited visitors and should not leave designated care areas in order to prevent further spread of

the disease.[8] Unfortunately, these guidelines may also interfere with current recommended multicomponent delirium prevention and management practices.[8] Isolation from family or loved ones, limitations of mobility, and the potential for depersonalization of clinicians through the use of PPE may contribute to the manifestation of delirium and interfere with the clinicians' ability to provide delirium screening or delirium management interventions.[8] Currently, there is a limited understanding of the effect of the COVID-19 pandemic on clinicians' ability to recognize and assess for delirium.

Methods

Objective

The objective of this qualitative study was to explore the barriers to delirium recognition and assessment among critical care clinicians (physical therapists, registered nurses, and respiratory therapists) during the COVID-19 pandemic using focus groups. This study was the qualitative portion of a multi-methods study.

Aims

The aims of this study were to 1) describe differences between three types of critical care clinicians in roles, responsibilities, and perceived barriers to delirium recognition and assessment, 2) to further explore and examine the attitudes, perceptions, and levels of stress among critical care clinicians when caring for patients with delirium and 3) to explore the impact of the COVID-19 pandemic on delirium recognition and assessment practices of critical care clinicians.

Design and Process

This was the qualitative arm of a larger, multi-methods study. Focus groups were selected for this study as they allow for the discussion of views relevant to the research topic and the

exchange of ideas or important issues by participants.[14] This method allowed for discussions focused on delirium among several participants who may have had shared experiences and potentially unique perspectives with delirium recognition and management.[14] Focus groups were selected over other methods, like one-on-one interviews, because the interaction and discussion between participants could expand or uncover a broader range of perspectives and epxeriencies.[14] The discussions were held over the Zoom remote meeting platform (Zoom, San Jose, California) in order to adhere to COVID-19 social distancing guidelines.[15] Each focus group was intended to last approximately 60 minutes with three to four participants and the primary investigator leading the discussion.

A semi-structured interview guide was developed for the focus group sessions based on gaps in the literature surrounding delirium recognition and the COVID-19 pandemic. The questions for the interview guide were based off of gaps regarding clinicians' perceptions of delirium, barriers to delirium recognition and assessment, barriers to effective communication of the presence of delirium, the impact of COVID-19 on delirium, and barriers to effective management of delirium. The guide began with a description of a patient experiencing delirium (based on characteristic descriptions of delirium found in literature) followed by questions regarding delirium recognition and assessment practices both pertinent to the patient scenario and the participants' general practices. The subsequent questions were focused on communicating the presence of delirium to other professions, perceptions of delirium, the effect of COVID-19 on delirium recognition, the prevention and management of delirium, and how participants could be better supported in recognizing, assessing, and managing delirium. All clinicians were provided with a $25 Amazon gift card for their participation.

Setting and Participants

This study took place at a large, academic hospital situated in a metropolitan area of Northern California. The study setting had multiple adult specialty ICUs: medical, surgical, burn, cardiothoracic, cardiac, neurosurgical, and mixed medical-surgical. Focus groups were conducted from February to March 2021. The institutional review board reviewed and approved the study and deeming it as exempt from full review.

Physical therapists, registered nurses, and respiratory therapists who were English-speaking and worked in the adult ICUs at least 51% of their time on-site for at least six months were included in the study. Clinicians were excluded if they worked in settings other than adult ICUs (e.g. pediatric specialties and wards, out-patient), worked less than 51% (part-time or per diem), employed on-site for less than six months, or did not provide direct patient care within the capacity of bundled delirium prevention and management strategies were excluded from this study.[3,16] Clinicians who met the inclusion criteria were invited to participate in the focus groups after participating in the quantitative arm of the larger multi-methods study (results reported on separately). Those who indicated interest in participating were contacted via email, provided information on the focus group sessions, and were offered a schedule to self-select convenient dates and times while they were off-duty. Consent information was provided to participants prior to the focus group sessions; participation in the study indicated their consent.

Analysis

Sessions were audio and video recorded through the Zoom platform. Recordings were then transcribed verbatim by a professional transcription service. All participant data were deidentified. Transcripts and recordings were reviewed using thematic analysis to generate themes and concepts.[17] Data were analyzed using an iterative process consisting of reviewing

transcriptions and recordings, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and then reporting findings.[17] The primary investigator also produced memos during the sessions and analytic and reflective memos after session to support data analysis. Each focus group session transcript was coded and concepts and themes were developed based on the number of codes that fit into each theme. Exemplar data and quotes were selected to summarize concepts and themes. Data collection and analysis was performed by the primary investigator.

Results

Participant Demographics

A total of twelve clinicians (eight registered nurses, three physical therapists, and one respiratory therapist) participated in the focus group discussions. Four focus group sessions were held, each lasted approximately 60 minutes, and each session had three clinicians participating. Focus group one consisted of three registered nurses, focus group two had two physical therapists and one registered nurse, focus group three had two registered nurses and one physical therapist, and focus group four had two registered nurses and one respiratory therapist. See Table 1 for additional clinician demographic information.

Themes

Through thematic analysis of the focus group recordings and transcripts, the themes and concepts were extracted and defined. Generated themes included: deprioritizing and normalizing delirium, clinicians' experiences with caring for patients with delirium, communication between clinicians about delirium, the interference of the COVID-19 pandemic, perceiving roles and barriers to delirium recognition, managing delirium: a balancing act, and supporting clinicians in recognizing and managing delirium. Refer to Table 2 for a summary of the themes and concepts.

Deprioritizing and Normalizing Delirium

Stabilizing and Addressing Immediate Problems.

Clinicians indicated that their priorities were centered on addressing perceived life-threatening issues or immediate physical problems that the patients were experiencing. Delirium recognition and prevention were viewed as a secondary task, not as an immediate concern. Participants described delirium as a consequence of being hospitalized, occurring later during a patient's hospitalization. Delirium was viewed as the source of symptoms that patients might be experiencing once other, higher-priority issues were ruled out. A registered nurse reflected on the process of ruling out higher priority issues before focusing on delirium:

> *"... usually you go through checking labs, maybe head CT, things like that to ensure that there's not something that's acutely changed within the medical diagnosis that can be attributed to it. Then, we usually go through the delirium diagnostic after that because ABCs, you have to make sure that you're treating something that maybe needs to be treated right now."*

In this example, the nurse described the process of prioritizing their assessment to identify acute or life-threatening problems that could be associated with the patient's diagnosis, like obtaining a CT scan to rule-out a stroke or checking lab results for metabolic derangements. The nurse mentioned ABCs (a mnemonic for the assessment and management of airway, breathing, and circulation) as taking priority before moving onto other assessments. Although delirium was viewed as an important problem to address, priority was given to ruling out other issues.

Normalizing Delirium.

Delirium was viewed as a normal or anticipated response to critical illness and hospitalization. Aberrant patient behavior associated with delirium was viewed as a normal response to the ICU environment. If delirium manifested in patients, then it was viewed by clinicians retrospectively as inevitable. If clinicians were unsure of the patient's baseline cognitive or functional status, then manifestations of delirium were attributed as "normal" behavior for the patient. The respiratory therapist indicated the difficulty with differentiating between a patient's baseline behavior and the manifestations of delirium:

> *"Sometimes it is like after the fact. I will just see a patient for the first time, and it will be my first time working with them. You know, they will be thrashing. I do not really know their baseline until maybe the day after or maybe a week later when they are completely pleasant. They say 'hi' to me like they are meeting me for the first time. They are like the nicest person I have ever met. It will not be until afterward that I realize they were delirious."*

This respiratory therapist recounted working with a patient presenting with agitation. The patient's behavior, thrashing around, was perceived as their normal behavior. The participant indicated surprise at the change in the patient's demeanor, which can occur with the fluctuating presentation in delirium. Only during later encounters with the patient did they suspect that the patient was experiencing delirium. Other professions conveyed similar experiences with patients; first they associated symptoms of delirium with a patient's baseline behaviors and were later taken aback by the presentation of the patient's true baseline behaviors.

Participants also indicated the ease in which other health professions attributed signs or symptoms of delirium to other, similarly presenting problems like dementia as the baseline

presentations of patients. A physical therapist described this process of minimizing and normalizing delirium by other professions:

> *"…[are] there any baseline cognitive deficits? It could just be attributed to that. They said, 'Oh well, they're confused at baseline, or they're demented' and just attributing to that where it could be a delirium on top of any baseline cognitive deficit. So, it could be hard to differentiate between the two."*

Hypoactive delirium was also normalized by clinicians. Though patients often presented as less active or agitated, they were viewed as an "ideal" patient. A registered nurse described their feelings regarding patients with hypoactive delirium:

> *"I feel like hypoactive tends to go a little more undiagnosed just because it's kind of like they're quiet and laying there. Yeah, they're not participating, but they're kind of the 'good patient' I guess because they're not ripping their lines out, they're not spitting on you, hitting you…"*

Both of the examples described the processes in which delirium was both deprioritized and normalized. The presentation of delirium was normalized when it was either attributed to another chronic problem that could not be easily resolved, like with the case of a patient with dementia, or the presentation of delirium was accepted because the patient was not agitated or creating unsafe conditions in the case of hypoactive delirium. Both examples describe the deprioritization of delirium by other clinicians as they characterize instances of delirium that may not have been effectively addressed because there was not a perceived life-threatening or acute problem. There is a known increase in mortality risk with delirium, particularly after presentations like these, however clinicians may not view this risk as an issue when weighing it against other problems or conditions encountered in the ICU.[2-3]

Clinicians' Experiences with Caring for Patients with Delirium

Delirium is Exhausting and Stressful for Clinicians.

Hyperactive delirium was viewed as disturbing and exhausting for clinicians. Participants stated that while their main focus was centered on ensuring patient and staff safety, patients required frequent reorientation to the point that they felt that their efforts were futile due to their patient's confusion. One registered nurse stated:

> *"Anytime I hear the word delirium, it's just like, oh God. That's so frustrating. That's the first thing that pops to mind."*

Another nurse reflected on caring for patients with known hyperactive delirium:

> *"I feel like the hyperactive ones are typically your one-and-done patients where nurses don't really want to stick with the same patients."*

Patients with hyperactive delirium may also be considered as "lower acuity", as they may require fewer critical care interventions, but still necessitate close monitoring while in the ICU. These patients might be paired with another patient for a nurse's assignment. Nurses reflected that in these instances their attention could not be wholly focused on ensuring their patient's or other clinician's safety and that they had even less time to dedicate to their patients suffering from delirium.

Participants indicated feeling defeated when they recognized delirium and understood that it interfered with their patient's recovery. A respiratory therapist summarized the experience:

> *"… you can feel like that hospital stay has just gotten extended. It is almost like there is a halt in the process of healing … it just gets halted. I think back to the extreme where it becomes a behavioral issue, they have to be sedated. You know, you just find out it is something that you wish did not have to be done. It keeps them in the ICU longer. It is a*

little deflating because it feels like it is a waste of time. Yes, when you do get them intubated and sedated you get that control. It just feels like a waste of resources for something that did not need to escalate."

Hyperactive delirium is the least common sub-type of delirium accounting for about 2% of cases, but it can have the most overt or obvious manifestation in patients characterized by restless agitation, confusion, and even combativeness.[2] Patients with hyperactive delirium often require frequent reorientation, redirection, and reassurance from the clinicians providing care while they also attempt to avoid interventions that might potentiate delirium like use of physical or chemical restraints.[2-3] Clinicians must also assure personal safety and the safety of their patients, which can be challenging when attempting to balance interventions for patients with hyperactive delirium. The experiences of exhaustion and stress described by participants seem to span across health professions when encountering or caring for patients with hyperactive delirium.

Communication between Clinicians about Delirium

Preferred Communication Methods.

Participants indicated the preferred method of communicating the presence of delirium was through verbal methods (face-to-face or telephone conversation). Some clinicians felt comfortable reporting their suspicions of their patients experiencing delirium to other clinicians. A physical therapist summarized the process of communication:

"Well, immediately tell the bedside nurse. That would be the first line, and then if we're going to rounds, we can talk about it in rounds as well, if the P.A.s [physician assistants] or N.P.s [nurse practitioners] are attending the rounds, too and charge nurses as well.

They can pass the message along to the doctors, or if it's something that is serious, if it's an acute change, then we can page the team."

Registered nurse participants stated that they would document the results of formal delirium assessments in patients' health records, but would not refer to the results of the assessments when communicating with other clinicians about the presence of delirium. Other health professions were not tasked with providing and documenting routine delirium screening using a validated tool. Instead, participants indicated that they preferred to describe the symptoms of delirium (like disorientation, hallucinations, and hyperactivity) when communicating to other clinicians. The preference to use signs or symptoms of delirium rather than the results of a validated assessment tool may be due to the clinicians' perceived limitations imposed by the tools themselves. Delirium assessment tools like the Confusion Assessment Method-ICU (CAM-ICU) provide a result of positive or negative but do not offer a description of the symptoms that patients might be experiencing.[3] Clinicians might prefer describing delirium symptoms over assessment tool results when communicating to other health professions as symptoms could be viewed as more tangible or substantial.

Barriers to Effective Communication.

Participants indicated that the main barriers to communicating the concerns for or manifestations of delirium were not being present during physician rounds (as clinicians might be caring for patients in other areas) and a perceived minimization of delirium by other clinicians. Participants preferred using verbal communication (face-to-face or telephone conversation) when describing delirium to physicians; however, if they were not available during physicians rounds then they felt that they had missed their opportunity to discuss the presence of delirium. Some clinicians also struggled with a perceived minimization of delirium in that other

clinicians or physicians were dismissive of delirium or, due to the fluctuating presentation of delirium, clinicians felt that they had to argue with other clinicians or physicians about the presence of symptoms of delirium. A registered nurse summarized this experience:

> *"I think sometimes the challenging part is sometimes clinicians do not see what we see. Oftentimes, I guess it is kind of timing too. By the time we are able to get the doctors up to the bedside, for some weird reason patients tend to kind of calm down at times. It has come to a point where I feel like in the back of my mind I know that I am going to have to do extra explanations of what had happened and why I think the patient is delirious for clinicians to believe what my assessment is of the patient."*

Nurse participants described communicating the presence of delirium to physicians or providers while physical therapists and respiratory therapists reported that they would express their concerns for delirium to the bedside nurse first, which might be due to the availability of the bedside nurse. This represented a barrier in communicating to the care team of the presence of delirium as physical therapists and respiratory therapists relied on the nurse to convey their concerns to physicians.

The frustration represented by the nurse's description of the challenges with communicating the presence of delirium to physicians could be related to the deprioritizing and normalizing of delirium in addition to communication barriers. Physicians often cannot spend the bulk of their time at the patient's bedside as they may be evaluating other patients, rounding, or providing treatments or interventions, so they rely on the assessments provided by nurses, physical therapists, or respiratory therapists. In the above example, the nurse described the use of symptoms rather than the results of a validated tool when communicating the presence of delirium to a physician. The nurse then indicated that they felt the need to provide additional

support for their assessment if it was different than what the physician found as a result of their assessment. It was unclear as to why the results of a validated delirium tool where not used, but this could be a result of a lack of buy-in or familiarity with the use of validated delirium tools on behalf of both the nurse and physician.

The Interference of the COVID-19 Pandemic

The COVID-19 Crisis.

Participants felt that patients with COVID-19 were more critically ill and had higher acuity than other ICU patients. These patients were also perceived as being in a more precarious state in that their condition could worsen rapidly and without warning, so clinicians further deprioritized delirium assessments. High volumes of critically ill patients and depleted staffing were also cited as limitations imposed by the pandemic. A registered nurse described prioritizing care between patients:

> *"… having COVID-19 patients and then having delirious patients – I imagine our priority was with these high acuity COVID-19 patients. Our patients who probably were just delirious is kind of second on our priority, or we did not have the capacity to assess them adequately for delirium."*

Delirium was described as being further deprioritized by clinicians among patients with COVID-19. The relationship between COVID-19 and risk for developing delirium is not yet well understood; however, patients with COVID-19 may be at an increased risk for developing delirium.[8,13] Participants indicated that they prioritized the stability and well-being of their patients over concerns for delirium due to the perceived tenuous status and critical-illness of their patients.

Isolation and PPE Interfered with Care.

The use of PPE and isolation (use of a single-occupancy room and limitations on visitors) were viewed as barriers to delirium assessment by clinicians though clinicians readily acknowledged the importance and benefit of these measures to prevent the spread of COVID-19. Clinicians felt that their use of respirators (powered and non-powered devices used to reduce the wearer's risk of inhaling hazardous airborne particles) interfered with their ability to talk with and assess patients. Use of PPE was also perceived as potentially stressful for patients because it obscured or covered their faces. A registered nurse summarized this feeling:

> *"The wearing of the equipment, can you imagine if you come out of your fog and then see a warm face smiling at you versus someone who looks like they stepped off a spaceship. You're like, where am I? What is happening? Just the physical visuals that they get waking up from their illness and seeing us and all that I think has a huge impact on how they can cope."*

Clinicians expressed frustrations with the use of isolation and also viewed it as a restraining factor on providing care and implementing delirium prevention measures. Every clinician mentioned the importance of early mobility and the presence of the patient's family or loved ones in delirium prevention and management. Patients isolated for COVID-19 could not leave the confines of their rooms (except for necessary diagnostic tests or procedures) and were not allowed any visitors at bedside. These limitations were felt as contributing factors to the development of delirium. A registered nurse described this experience:

> *"Well, they're literally in a room with the door closed, and family is not allowed to visit, and doctors are barely going in the room. So, I can only imagine how lonely it is, too; not understanding why you're seeing your family on an iPad instead of holding your hand at*

the bedside. Then, they're in that same four walls. I just can't imagine being in these four walls with the door closed and not being able to hear even what's going on."

Isolation and use of PPE are associated with increased of delirium risk among patients.[7] Participants viewed isolation and PPE as dehumanizing or depersonalizing for both themselves and patients. Isolation and PPE also were stated to be disruptive for key components of delirium recognition and management, specifically delirium assessment and the involvement of patients' family members or loved ones with patients' care.[16]

Perceiving Roles and Barriers to Delirium Recognition

Registered Nurses: Defenders from Harm.

Nurses indicated that they were focused on addressing the acute physiologic problems that the patient was experiencing and ensuring stabilization of those issues. Delirium was considered as a problem for the patient if the patient had persistent issues that could not be explained by the patient's diagnosis. Nurses would consider delirium as a problem in their patients if they began to show signs of delirium, usually in the form of confusion or hyperactivity. Delirium was also a concern for nurses if other clinicians, family members or loved ones, or sometimes the patients themselves informed them of new or aberrant behavior from the patient's baseline. A registered nurse summarized delirium as it overtly presents coupled with deviations from a patient's baseline behavior:

"We can identify that the patient is confused, or they are progressively being more confused, agitated, and picking and pulling at things. Or it could just be kind of full-blown all of a sudden that they are just kind of combative instead of just being confused. It is just like kind of recognizing the state. If you already are familiar with that patient

and know their baseline, it is just to kind of be aware of the differences in their behavior."

This was an exemplar of the nurses' responses to recognizing delirium. Nurses stated that they relied on their familiarity of their patients' baseline behaviors instead of utilizing a delirium assessment tool.

Physical Therapists: Keeping Everyone Safe.

Physical therapists indicated that they relied on consistently working with patients in order to determine the presence of delirium. Changes in patient's behavior during therapy sessions would help them to recognize delirium, and these changes in behavior could lead to physical therapists using a validated delirium assessment tool to further ascertain the presence of delirium. Physical therapists would also receive notification from other clinicians, typically nurses, that the patient was agitated or otherwise uncooperative and could not participate with therapy. One physical therapist described this decision:

"…then sometimes you're in this fine line of is it safe to mobilize them because they're so agitated? So you want to keep everyone involved safe, the patient as well as the nurse, therapy, lift team."

In these circumstances the physical therapist would have to weigh providing therapy and assuring patient and staff safety. Physical therapists also remarked that inconsistent or depleted staffing was a limitation in being able to recognize delirium among patients.

Respiratory Therapists: It's All About the Airway.

The respiratory therapist participant shared similar sentiments to the registered nurses in that their main focus of patient care was centered on prioritizing immediate issues or problems that patients may be experiencing. They also described recognizing delirium through their

patient's behaviors and their tolerance or adherence to any interventions that the respiratory therapist might be providing. The respiratory therapist described addressing the life-threatening issues patients might experience over recognizing delirium:

> *"I mean we just flat out get busy and it kind of falls by the wayside. It just slips our mind. We just care about… as RTs, we think about the more important task and the thing that takes precedent. Just assessing for confusion or delirium is just not a top priority. You know, it is usually like maintain airway or respiratory distress. I think that sometimes this gets lost, especially when you are busy and especially during this era I guess."*

Managing Delirium: A Balancing Act

Participants discussed several delirium management strategies. Altering the environment (reducing lighting, silencing monitor alarms, and providing access to sunlight) to allow for restorative rest or adhering to a sleep/wake cycle was discussed as a helpful management strategy. Mindful medication administration (avoidance of deliriogenic drugs) was also cited as a helpful delirium management method. Early mobility, the presence of family or loved ones, and re-introduction of home routines were also frequently suggested as delirium management strategies. Collaboration with other clinicians was mentioned as a method to ensure the success of delirium management strategies.

Most of the clinicians cited that inconsistencies with clinicians or management strategies were barriers to successful delirium management. These inconsistencies included new or different clinicians providing care to patients who were unfamiliar with the delirium management plan for the patient or disruptions in implemented management strategies like alterations in restorative rest. Clinicians also felt hesitant to implement delirium management methods if they were perceived to interfere with ongoing therapies or if patients were considered

"too critically ill". Participants stated that they felt responsible for implementing many of the delirium management interventions and that there were varying degrees of direction regarding delirium management from physicians. A registered nurse described balancing between delirium management and providing care to their patient:

> *"You skip a turn so that they have a six-hour chunk where as long as they're physiologically stable obviously where they would have six hours of undisturbed darkness for their body to try to catch some of that really actual sleep. We've found that made a really big difference in our cases of delirium. It's challenging because sometimes you need to be in there, and that's why they're in ICU because they need that care around the clock. Sleep is definitely a big factor for sure."*

This statement is exemplar of the nurse autonomously weighing benefits and consequences of routine care with delirium management. Their description of skipping a turn in order to assure restorative rest is an instance of assessing the current evidence of repositioning and pressure ulcer prevention, the benefits of uninterrupted rest, and recognizing the specific benefits or risks that the patient may face.

Supporting Clinicians in Recognizing and Managing Delirium

Participants suggested that clinicians should be offered additional education for the recognition and management of delirium. Education focused on the impact of delirium on patients, practice with delirium assessment methods, and the nuances of delirium while increasing the frequency of education to an annual basis were all suggested by the clinicians. Participants also indicated that collaborative delirium management practices between clinicians should be fostered in order to share agency over delirium recognition and management. Clinicians expressed a desire to obtain additional support from their institution to help increase

physician buy-in for delirium prevention and management. These sentiments were described by one registered nurse:

> *"I think by continuing education, frequently for us it would give us the language that we need to speak up more often. I feel like I hear about and learn about delirium maybe it's been twice in my 10 years of experience, but if it was a yearly thing I feel like I can have better dialog with the providers and the patients. It would be nice to see the stats, like how much does delirium extend ICU stay? How much is the cost for the hospital? What is the burden to the patient long-term afterwards? Getting those facts and figures I feel like either bi-annually or annually just I think would help reinforce to everyone, including our colleagues, why aren't we coming at this a little bit more aggressively than we had in the past?"*

This quote exemplified the desire of the participants to further understand delirium, help to keep the problem of delirium visible, and even re-prioritize it for health professions. Physical therapist and respiratory therapist participants indicated that they were interested in additional education or training centered on delirium. It should be noted that these clinicians are not formally included in their institution's delirium assessment process (the routine screening and documentation of a validated delirium assessment tool), and instead this responsibility lies with nurses. Inclusion of these health professions in the delirium training and assessment continuum may help to ensure the detection and reprioritization of delirium.

Discussion

The aims of this study were to describe differences between critical care clinicians in roles, responsibilities, and perceived barriers to delirium recognition and assessment, to explore the impact of the COVID-19 pandemic on delirium recognition and assessment practices of

critical care clinicians, and further explore and examine the attitudes, perceptions, and levels of stress among critical care clinicians when caring for patients with delirium. The findings were grouped into seven themes with the overarching main findings indicating that clinicians recognize delirium similarly to each other, experience multiple barriers to delirium recognition and management (including the presence of the COVID-19 pandemic), and view delirium as stressful, time-consuming, and potentially harmful for themselves, other health professions, and the patients experiencing it.

Deprioritizing and Normalizing Delirium

Delirium was viewed by clinicians as a lower priority problem occurring later in hospitalization after physiologic stabilization of the patient. The mean onset of delirium among adult patients has been measured at 2.6 days from ICU admission with a duration of 3.4 days.[2] This shared view among clinicians was in conflict with the current understanding of the onset of delirium. This could be, in part, due to clinicians' not recognizing the subtle presentation of delirium or not prioritizing delirium assessments with other assessments or treatments viewed as more important or necessary. While delirium was understood as a common problem for patients in the ICU, it was viewed as a secondary issue when weighed against other problems associated with critical illness like stroke, medication side effects, respiratory failure, or septic shock. These findings are similar to other studies surrounding the perceptions of delirium in that delirium was viewed as a lower priority issue by physicians and nurses.[19-20] Physical therapists and respiratory therapists involved with this study also shared this view of delirium being a secondary issue for patients. Participants also discussed the issue of normalizing delirium among patients. Clinicians indicated that delirium was anticipated among patients as a response to critical illness or being in the ICU. When patients presented with aberrant behavior like agitation or stupor, these behaviors

were first attributed to the patient's baseline behavior or another problem like dementia. If the clinician understood that the patient was not in fact acting at baseline, then they would consider delirium as an issue. The normalization of delirium could be attributed to the high frequency in which it is encountered by health professions in the ICU as well as the inevitability of delirium occurring among patients. Rates of delirium can be as high as 80% in the ICU setting. [2-3] This normalization paired with the deprioritization of delirium over other interventions may result in clinicians viewing delirium in vague terms compared to other immediate issues that patients could be experiencing during critical illness that clinicians may feel more able to address or resolve. Clinicians might not be cognizant of the long-term sequelae of delirium, particularly while they are caring for critically-ill or fragile patients.

Clinicians' Experiences with Caring for Patients with Delirium

All participants indicated that delirium was stressful to experience for themselves and patients, that managing delirium was time-consuming, and that delirium was a potential threat to their safety, the safety of other clinicians, and their patients. These findings are all similar to other studies centered on the impact of delirium on clincians.[3-6,19-20] Despite the experience of stress and potential threats to safety, delirium was still viewed as a lower priority, normalized issue. Delirium was viewed as a common problem among patients in the ICU and was recognized when its symptoms or presentation were more overt, like with agitation associated with delirium. This conflict could represent a deprioritzation and normalization of the experience of delirium by clinicians in that the stress experienced while encountering it is also viewed as inevitable or a feature of caring for critically ill patients. It is estimated that up to 75% of cases of delirium are missed by clinicians.[3] Even though clinicians acknowledge the dangers of delirium and claim that it is stressful when caring for patients with it, delirium continues to be under-

assessed and under-managed. Reaffirming the importance of delirium assessment and management and involving additional health professions within the delirium care spectrum may help to reduce the rates of missed cases of delirium and improve the experiences of clinicians when caring for patients with delirium.

Communication between Clinicians About Delirium

Clinicians stated that verbal communication was the preferred method of describing the presence of delirium to other clinicians over documentation in the patient's medical record. Participants stated that a barrier to effective communication was not being present or available to inform other clinicians or the physician team of the presence of delirium. Clinicians also indicated that they were less likely to report signs of delirium due to lack of concern from other clinicians or the physician team unless the patient was combative or presented as a safety risk to themselves or the clinician. The use and documentation of a delirium assessment tool without using the results in discussion of delirium with other clinicians and the preference of using verbal communication over documentation appear to be novel findings of this study. Similar studies using focus group interviews note the struggles of nurses with regards to being unable to perform assessments and documenting them due to time or workflow constraints, or documenting assessments retrospectively, at the end of a shift.[4-5] The "retrospective delirium assessment" may be occurring for the participants of this study as well; however, there was a noted lack of use of the assessment tool results when communicating to other clinicians about delirium. Participants indicated a preference for describing signs of delirium when communicating its presence to others. Delirium can widely vary in its presentation, so reporting symptoms rather than the findings of a validated assessment may not provide a consistent or accurate picture to other clinicians[2-3]. Clinicians not using the results of assessment tools due to lack of buy-in from

physicians or other clinicians and instead using clinical judgement or overt signs of delirium are similar to findings from similar focus group studies with nurses and physicians.[4-5,19-20] The lack of buy-in among physicians and other clinicians regarding validated tools may be associated with unfamiliarity with the assessment tools on the part of the physicians or other clinicians and also may indicate further deprioritization and normalization of delirium beyond health professions working directly at the bedside. Providing additional education or training on delirium and the use of delirium assessment tools to critical care clinicians and involving other health professions in addition to nurses in the delirium assessment process might help to improve interprofessional communication and increase institutional and clinician buy-in.

Unique to this study was the inclusion of physical therapists and respiratory therapists. Both clinician types stated that they recognized delirium in a similar manner to registered nurses, in that delirium was suspected in patients when overt signs of agitation or confusion were present. Physical therapists mentioned a varying familiarity with delirium assessment tools, while the respiratory therapist was not familiar with the assessments tools. Neither clinician type was responsible for providing or documenting the results of a formal assessment tool. Both physical and respiratory therapists did prefer to communicate their concerns for delirium verbally, much like registered nurses. This preference to communicate using a verbal description of the signs and symptoms of delirium over the results of an assessment tool by most of the participating health professions indicates that these assessment tools may not be viewed as helpful in notifying physicians and other clinicians about delirium as it manifests in patients. Furthermore, physical therapists and respiratory therapists may not have access to the methods of documenting the results of delirium assessments outside of a typed note within the patient's electronic chart. Methods to improve communication could include the use of an

interprofessional communication tool emphasizing the use and results of delirium assessments in addition to providing clinicians with the means to document delirium assessments within the patient's electronic health record.

The Interference of the COVID-19 Pandemic

Participants stated that there were major barriers to delirium recognition and management imposed by the high acuity of patients with COVID-19 and the need for PPE and isolation. Many clinicians stated that assessing for delirium was a much lower priority to them, more so than before the pandemic, while having to provide other assessments or interventions and ensure the physiologic stability of their patients with COVID-19. Many clinicians also felt that any additional or lower priority interventions could interfere with the well-being of their patients. The use of PPE was seen as necessary, but interfered with communication and assessments. Several clinicians also expressed concern with the use of PPE contributing to delirium by masking their identities or scaring patients. Nearly every participant discussed the benefits of family involvement and early mobility for the management or prevention of delirium; isolation was viewed as interfering with these key components of delirium management. The use of PPE and isolation is associated with an increased risk for developing delirium among patients.[7] Currently there is limited understanding of the impact of the COVID-19 pandemic and use of PPE and isolation on developing delirium; however, early research has indicated that patients with COVID-19 may be at an increased risk for developing delirium.[8-9]

Participants felt that rates of delirium among patients with COVID-19 could have been higher than other critically ill patients, but their priorities were centered on addressing the immediate life threatening issues or stabilization of patients. Due to the tenuous state of patients with COVID-19, clinicians stated that they were focused on assuring the physiologic stability

and safety of their patients acutely and gave less consideration to long-term issues, like delirium, that their patients could face. While delirium assessments and management interventions do not often interfere with other critical care interventions clinicians stated that they felt that the use of isolation and PPE while caring for unstable patients with COVID-19 interfered with their ability to provide these specific assessments and interventions.[16] There might not be a method to reprioritize delirium assessments and interventions among critical care clinicians in the face of perceived life-threatening problems during the height of a global pandemic, but educating health professions on delirium assessment and management techniques may help to assure that clinicians provide these interventions while safely providing care.

Perceiving Roles and Barriers to Delirium Recognition

Delirium was said to be recognized by clinicians if patients had overt signs or symptoms of it usually in the form of hyperactivity, confusion, or agitation. While formal delirium assessments are performed and documented by registered nurses, the results of these assessments were not said to be used when communicating the presence of delirium to other clinicians. This is a similar finding to a 2017 study by Zamosick et al., in that clinicians preferred to rely on their clinical judgment and the overt presentation of delirium in their patients instead of using the results of a validated tool when attempting to recognize delirium or communicating its presence to other clinicians.[19] This preference of using clinical judgement and signs of delirium over a validated tool may lead to further missed cases of delirium, which is an existing issue among patients in the ICU.[19] There might be a confluence of issues with regards to missed opportunities to recognize delirium and the deprioritization and normalization of it among ICU patients. If health professions do not view delirium as a priority and if it is perceived as a normal process of critical illness then they may not readily recognize it as it manifests in patients. Altering this

perception can be possible by involving additional critical care clinicians in the delirium assessment process. Delirium also has a broad spectrum of clinical manifestations with many subtle features that can be easily missed.[2-3] Patients remain susceptible to the consequences of delirium, like high mortality risk and prolonged cognitive dysfunction, and it is estimated that the majority of cases of delirium are missed.[2-3] Involving all critical care clinicians in the delirium assessment and management process may alter the perceived roles in delirium recognition creating a shared agency of delirium care and increase the rate at which delirium is detected and managed.

Managing Delirium: A Balancing Act

Participants frequently cited the use of multiple, nonpharmacologic interventions as methods to manage delirium. These management methods included alterations to the environment like reducing lighting and noise, enforcing restorative rest schedules, providing a windowed room with access to sunlight, supporting family involvement, and mobilizing patients. Clinicians also discussed the withholding of medications associated with the development of delirium. Each of these was said to be implemented autonomously by clinicians once they felt that the interventions would not interfere with other therapies, with sometimes little or no direction from physicians. Each clinician noted that to ensure the success of these interventions they must be consistently provided by other clinicians throughout the patient's hospitalization. Participants also noted that successful delirium management was a collaborative effort, requiring the support of multiple clinicians of different disciplines. The autonomous management of delirium with the minimal input from physicians suggested by the participants may stem from the relative simplicity of these delirium management interventions, many interventions are nonpharmacologic, coupled with low buy-in from physicians regarding the presence of

delirium.[4,19] Participants reported frustration with feeling the need to assert the presence of delirium when communicating with physicians, either because the conversation may not result in actions from physicians or the clinicians might have felt that they were not believed by physicians. It seems that clinicians felt that they could implement delirium management methods without input from physicians, thus avoiding the need to communicate with physicians. Clinicians felt empowered to autonomously provide delirium management interventions but the root cause of this issue, minimizing or deprioritizing the presence of delirium by other health professions, has not been addressed. If delirium is perceived as a priority and as the herald to serious outcomes like the increased risk of death and disability then it could be more readily and seriously recognized and managed by clinicians. Interprofessional training and additional involvement between health professions in delirium recognition and management practices could help to foster greater communication and trust between clinicians with regards to the presence of delirium.

Supporting Clinicians in Recognizing and Managing Delirium

This study showed that clinicians (registered nurses, physical therapists, and respiratory therapists) prefer to rely on the presence of agitation or confusion rather than validated assessment tools when recognizing delirium. Despite this lack of reliance on using assessment tools to determine the presence of delirium, registered nurses still documented the results of their findings within the patient's electronic health record. Clinicians continue to view delirium as stressful and harmful for patients. Clinicians also viewed the COVID-19 pandemic as a further limitation on their ability to prioritize delirium recognition with their patients, and also viewed the pandemic as contributing to the presence of delirium among their patients. The COVID-19 pandemic was a tremendously difficult experience for clinicians, as it resulted in a surge of

critically ill patients and placed a tremendous tax on healthcare systems. Beyond adhering to COVID-19 treatment and infection prevention guidelines while caring for many critically ill patients, it was difficult to provide support for the recognition and management of delirium.

Nonpharmacologic delirium management methods were viewed as relatively simple to provide to patients; however, the COVID-19 pandemic was viewed as a restraining factor for managing delirium due to the severity of illness that patients were experiencing and the limitations imposed by the use of PPE and isolation. Delirium continues to be viewed as stressful by clinicians who encounter it among their patients. Participants recommended increasing the frequency of delirium education (including the use of assessment tools) and providing it to a broader range of health professions instead of once and only for nurses as a way to support clinicians and increase buy-in. This might also help to increase the focus on the collaborative approach to delirium care and may help to improve communication between health professions and reprioritize delirium as an ongoing problem.

Strengths and Limitations

The strengths of this study were the inclusion of physical therapists and respiratory therapists with registered nurses in discussions of delirium, the use of focus groups as a method to further describe clinicians' perceptions of delirium, and the examination of the impact of the COVID-19 pandemic on delirium recognition and management. The majority of research regarding clinicians and their experiences with delirium is focused on the perspectives of registered nurses and physicians. This study is one of the few to include physical therapists and respiratory therapists to gain additional perspectives on barriers to delirium recognition and management. The use of focus group discussions allowed for participants to describe their perceptions concerning delirium and the COVID-19 pandemic while also fostering interactions

and discourse with other critical care clinicians.[14] Finally this study expands on clinicians' perceptions of the COVID-19 pandemic and its impact on delirium recognition and management.

Limitations of the research include the use of a single site and the lack of variety in the types of clinicians participating in the study. Only twelve participants were involved with this study, the majority of which were registered nurses, so responses could have been biased. This larger number of nurses could have affected the diversity of thought. The focus groups were held during the course of the pandemic through an online platform, which imposed restrictions on meeting in-person. Furthermore, clinicians might have been less willing to participate in a study during the height of a global health crisis. This was a qualitative study, so findings are not generalizable to a broader population of clinicians.

Implications for Future Research and Practice

Further research is warranted on the different roles of clinicians in recognizing, assessing, and managing delirium. Future research should focus on other clinicians in addition to physicians and registered nurses. Delirium appears to impact other clinicians and these clinicians may have a larger role in detecting or managing delirium and further research of collaborative delirium recognition and management practices may help to better address the problem of delirium. Participants recommended delirium education provided with greater frequency and additional support from institutions and physicians in recognizing and managing delirium. Providing robust delirium education focused on the nuances and problems associated with delirium and the use of validated assessment tools, including practicing the use of validated tools, may help to increase clinician comfort with assessing for and managing delirium. Inclusion of physicians with education and collaborative delirium prevention management practices may help to increase the levels of support desired by clinicians.

Conclusion

The results of this study helped to expand the understanding of the roles of registered nurses, physical therapists, and respiratory therapists in delirium recognition, assessment, and management as well as the impact of the COVID-19 pandemic on these practices. Clinicians would benefit from additional support in the recognition of delirium and the use of delirium assessment tools. The participants' emphasis on the use of collaborative practices should continue to be fostered. The COVID-19 pandemic was also a major source of interference in the delirium recognition and management practices of the clinicians. There is a risk of developing delirium among patients with COVID-19, which should be emphasized for clinicians in order to support further collaborative delirium recognition and management practices during the pandemic.

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Tables and Graphs

Table 1

Participant Demographic Characteristics (N=12)

Characteristic		Total	%
Gender	Male	5	41.7
	Female	7	58.3
Age (years)	18-24	1	8.3
	25-34	4	33.3
	35-44	7	58.4
Ethnicity	Caucasian/White	4	33.3
	Asian	4	33.3
	Hispanic/Latinx	2	16.7
	Other	2	16.7
Current Role in the ICU	Registered Nurse	8	66.7
	Respiratory Therapist	1	8.3
	Physical Therapist	3	25
Length of Time in Current Role	6 months to 1 year	1	8.3
	1 to 4 years	3	25
	5 to 9 years	8	66.7
Degree	Associate's Degree	1	8.3
	Bachelor's Degree	6	50
	Master's Degree	4	33.3
	Other Doctorate	1	8.3
Main ICU or Specialty	Cardiac ICU	2	16.7
	Cardiothoracic ICU	1	8.3
	Medical ICU	2	16.7
	Medical Surgical ICU	6	50
	Variable/Float	1	8.3

Note. ICU, intensive care unit

Table 2

Themes and concepts regarding the barriers to delirium recognition and assessment during the COVID-19 pandemic.

Theme	Concept
Deprioritizing and normalizing delirium	Physiologic stabilization is considered the top priority Delirium recognition and prevention is not an initial concern Delirium is a patient's response to the ICU environment Delirium was viewed as an answer for problems that patients might be experiencing once other problems were ruled out If a patient's baseline behaviors were not understood, then manifestations of delirium could be considered "normal"
Clinicians' experiences with caring for patients with delirium	Delirium was disturbing and exhausting for clinicians Delirium requires extra effort to maintain safety Delirium leads to feelings of defeat among clinicians Patients with delirium were "lower-acuity" but required more intensive observations and interventions
Communication between clinicians about delirium	Clinicians preferred verbal communication when discussing the presence of delirium Results of delirium assessments were documented but not used when communicating to physicians Concerns for delirium may be dismissed by other clinicians or physicians due to Clinicians may not be able to communicate concerns for delirium if they are not present during physician rounds
The interference of the COVID-19 pandemic	Perceived high acuity, depleted staffing, and rapid changes in patients' conditions further deprioritized delirium assessments PPE and isolation interfered with communication with patients PPE and isolation were perceived as alarming or stressful for patients Isolation prevented patient mobility and presence of family
Perceiving roles and barriers to delirium recognition	Clinicians were focused on addressing acute issues and physiologic stabilization Overt signs of delirium are recognized, but not nuanced signs Delirium is suspected if patient is acting differently from baseline

Table 2 (continued).

Managing delirium: A balancing act	Changes implemented in environment Emphasis on family involvement and mobility Clinicians were frustrated with inconsistent management Clinicians implemented nonpharmacologic interventions autonomously with little physician input Clinicians expressed discomfort with management practices if they were perceived as interfering with other interventions
Supporting clinicians in recognizing and managing delirium	Clinicians recommended increasing delirium education frequency Clinicians appreciated collaborative approach to delirium management Support from the institution may help increase clinician and physician buy-in

Note. ICU, intensive care unit; PPE, personal protective equipment

Discussion

The studies within this dissertation contribute to the understanding of the barriers to the recognition and assessment of delirium and the impact of the COVID-19 pandemic on these practices among critical care clinicians. The findings of this research support the current understanding of the perceptions of delirium held by the nurses and physicians while also addressing existing gaps in the literature by including the perspectives of physical therapists and respiratory therapists. This dissertation also examined the influence of COVID-19 and the global pandemic on the delirium recognition and assessment practices of these health professions during the height of the pandemic.

Implications for Clinical Education and Policy

The findings of the two studies from this dissertation can be used to further inform clinical education and policy. Ultimately these results can be used to expand clinical education in order to improve delirium recognition and management practices across health professions. Both studies support the notion that health professions do not prioritize delirium with other serious problems that might arise in the critical care setting despite understanding that delirium can result in long-term sequalae for patients. The studies found that clinicians encounter delirium with enough frequency to understand that its presence imposes potential safety risks for themselves and their patients, increases workload, and is distressing to witness. The two studies supported the idea that clinicians view delirium as a complex problem that is better detected and managed utilizing an interprofessional and collaborative approach rather than designating recognition and management tasks discreetly between clinicians. The qualitative study expanded on the breakdowns in communication between health professions and focused on the issue of health professions not using the results of delirium assessment tools when communicating to

physicians about delirium. This breakdown in communication is further exacerbated by the clinicians' perception of physicians not believing in other clinicians or not acting upon the assessments of other clinicians when concerns of the presence of delirium are disclosed. Both studies also provided novel information on the impact of the COVID-19 pandemic on the practices of clinicians. Clinicians felt that the surge of critically ill patients and the necessity of utilizing isolation and PPE were interfering factors that further deprioritized delirium recognition and management.

Clinical education regarding delirium could be improved by expanding it to all clinicians who encounter patients at risk for delirium and increasing the frequency in which education is provided to an annual or bi-annual basis. Based on the results of both studies, topics that would be beneficial to learners include: appropriate use of validated delirium assessment tools, long-term consequences of delirium, the subtle manifestations of delirium, delirium management methods, and communication technique for the disclosure of the presence of delirium within the interdisciplinary team. By expanding education to accommodate these topics, clinician buy-in with regards to the importance of detecting and managing delirium could be improved. The implementation of these changes to delirium education could also reprioritize delirium for clinicians. Finally, should another global health crisis like the COVID-19 pandemic of 2020 occur, clinicians could be better prepared to detect and manage delirium with less interference from other necessary interventions like isolation or PPE.

Current delirium management methods recommend the use of multiple interventions carried out in tandem utilizing an interprofessional approach (Ely, 2017). Physical therapists, physicians, respiratory therapists, and registered nurses play a vital role in delirium recognition and management among hospitalized patients (Ely, 2017). Successful delirium detection and

management relies on robust communication and continuity of interventions, so any breakdown in either could result in the manifestation of delirium in patients (Ely, 2017). Delirium recognition and management policies vary by institution. The participants of the two studies indicated that only registered nurses were responsible for providing and documenting delirium assessments. Other health professions indicated that they often recognized delirium in patients and would notify other members of the care team of its presence which would have a varied response on whether or not delirium was further assessed or managed by other clinicians. Participants in both studies indicated that they preferred to share the responsibility of delirium assessment as an interprofessional team rather than relying on a single profession to carry-out the assessments independently. Policy can be altered to include additional health professions, particularly professions involved in the delirium care continuum, to support requirements for delirium education and the routine assessment and documentation of delirium using validated tools. Inclusion of additional professions in the delirium assessment process would expand clinician agency over delirium recognition and management and increase institutional buy-in.

Limitations

There were several limitations imposed on both studies. The studies were performed during the height of the COVID-19 pandemic, between late 2020 to early 2021. The survey and focus groups had reduced response rates and participation respectively because the populations of interest for both were critical care clinicians. These clinicians were spending their time focused on providing care to critically ill patients or addressing associated issues from the pandemic (e.g. handling personal stress) and likely had less time to dedicate to participating in the studies (Vizheh et al., 2020). Both studies required participants to recall their delirium recognition and management practices. The results of the studies offered more of an evaluation

of the educational needs of the participants rather than a reflection of clinical practice. The studies also had a high number of registered nurse participants with relatively low representation from other health professions. One of the central aims of these studies was to include the perspectives of additional clinicians, particularly those who had not yet shared their perspectives about delirium. The abundance of nurse participants might have led to skewed responses in the survey study and may have influenced the diversity of thought in the focus group study. For the quantitative study the limited response rate, lack of diversity in respondents, and the use of a single-site for the survey study could affect the generalizability of findings. For the qualitative study the use of focus groups within a single-site and a majority of nurse participants meant that the findings were not generalizable to a broader population of clinicians.

Conclusion

The findings of the studies within this dissertation contribute to better the understanding of the barriers to delirium recognition and assessment among critical care clinicians and provide new insights regarding the impact of the COVID-19 pandemic on delirium recognition practices. Both studies have several implications for clinical education and policy. Delirium continues to be a problem that requires attention and cooperation across health professions in order for it to be successfully addressed. The findings of these studies can aid clinicians in the continued efforts in helping those suffering from delirium.

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Literature Review

Delirium

Delirium is an acute confusional state characterized by a disruption of attention and cognition (Inouye et al., 1999). Delirium in its acute form results in a reduced ability to focus, sustain, or shift attention that results in a cognitive or perceptual disturbance not accounted for by pre-existing or evolving dementia (Francis, 2014). Patients with a history of pre-existing dementia are at an increased risk for developing delirium superimposed on dementia (Morandi et al., 2018a). Delirium has been most associated with hospitalization, and has been described as a hospital-related complication or an indicator of inadequate hospital care (Inouye et al., 1999).

Delirium Subtypes

Delirium is divided into four subtypes: hyperactive delirium, hypoactive delirium, mixed delirium, and subsyndromal delirium (SSD) (Marino, 2014; Serafim et al., 2017). Hyperactive delirium is the least common form of delirium accounting for less than 2% of all cases and is characterized by restless agitation, confusion, and even combativeness (Marino, 2014). Hypoactive delirium, comprising 45 to 64% of all cases of delirium, presents differently with lethargy, confusion, and somnolence, and is the most common form of hospital associated delirium (Marino, 2014). Mixed delirium (6-55% of cases) is characterized by fluctuating episodes of hyperactive and hypoactive delirium (Marino, 2014). SSD is characterized by less severe cognitive impairment in comparison to delirium, in which some, but not all diagnostic or assessment criteria for delirium are met (Serafim et al., 2017). SSD has been described as an intermediate state between delirium and normal cognition (Serafim et al., 2017). A concern associated with SSD is the risk of patients developing another subtype of delirium if SSD is allowed to persist (Serafim et al., 2017).

The Effects of Delirium

Hallmark signs and symptoms of delirium include increased vigilance, deficits in attention, increased tremulousness, agitation, confusion, disorientation, hallucinations, stupor, and catatonia (Francis, 2014). Patients report that the hallucinations, confusion, and disorientation associated with delirium were vivid and were a source of anxiety or fright (O'Malley, Leonard, Meagher, & O'Keefe, 2008). Common hallucinations include the presence of animals such as fish, insects, or giraffes, as well as the presence of people (such as deceased family members or strangers) (O'Malley et al., 2008). Patients have also reported that their hallucinations are centered on staff members, family, other patients, or their physical location (DiMartini, Dew, Kromos, McCurry, & Fontes, 2007). One patient experiencing delirium described witnessing their son being beaten to death in their hospital room, another patient described that their room and clothing were on fire and yet they were restrained to their bed and could not escape the perceived threat, and another patient experiencing delirium associated hallucinations described other patients and staff members hiding in their room in order to secretly observe them (Dimartini et al., 2007). Common delusions experienced by patients while hospitalized include being at "wild parties" or being under attack from hospital staff according to O'Malley et al. (2008). During the course of delirium and as it resolves, patients report feeling overwhelmed, humiliated, and distressed (O'Malley et al., 2008). Delirium may also predispose surviving patients to post-traumatic stress disorder (PTSD) (O'Malley et al., 2008; DiMartini et al., 2007).

The patient's experiences of delirium are harmful and distressing. The consequences of delirium also impact family members and healthcare staff of the patients who experience it. Family members report high levels of distress when witnessing a loved one experience a

delirious episode (O'Malley et al., 2008). Furthermore, nursing staff report high levels of distress when managing patients with severe delirium as well as a perceived increase in workload and use of resources (O'Malley et al., 2008).

The literature surrounding the patient's experiences and perceptions of delirium has centered mostly on qualitative interviews with delirium survivors, family members of patients with delirium, or staff managing patients with delirium (Dimartini et al., 2007; O'Malley et al., 2008). This literature centers on the lived experiences of patients with delirium as well as the experiences of family and staff attempting to respond to and manage the effects of delirium (O'Malley et al., 2008). The qualitative literature on delirium also allows for a rich description of delirium associated hallucinations and delusions, which would be difficult to describe through quantitative research. While understanding the experiences and perceptions of delirium are important, it is also vital to understand delirium as it occurs among patients and its greater impact on health systems.

The Prevalence of Delirium

Delirium appears to be common among hospitalized patients. According to Maldonado (2008), "[Delirium's] prevalence surpasses most commonly known and identified psychiatric syndromes and varies depending on the medical setting" (p.658). Current rates of delirium among hospitalized patients range from 14% to 56% among older patients, 28% among acute care patients, and 21.2% among acute care patients with or without dementia (Inouye et al., 1999; Schubert et al., 2018; Morandi et al., 2018a). The prevalence rates of delirium among hospitalized patients seem to vary as these rates have been collected from a range of sources such as systematic reviews, single hospital point prevalence studies, and multi-hospital or multi-care area prevalence studies. These types of studies allow for a better understanding of delirium as

they were performed in multiple hospitals; however, each study was only able to establish a point prevalence of delirium among patients with differing characteristics. Two of the prevalence rates of delirium were close to each other, while the wide ranging rate was gathered from a review of delirium prevalence rates. Considering the differences in the studies, these delirium prevalence rates do provide a better understanding of delirium as it occurs in the acute care hospital setting.

Rates of delirium also seem to vary among patients after receiving specific types of interventions. Authors of studies concerning patients undergoing elective surgeries have shown delirium rates from 1% to 11% for select urologic procedures, and 44% for any major, non-neurosurgical procedure (Ha et al., 2018; Moskowitz et al., 2017). These rates vary as well and are based off of multi or single site cohort studies. Furthermore, the type of surgery that the patients underwent varied within and in between both studies. Ha et al. (2018) focused on a large sample of patients experiencing delirium undergoing urologic procedures. The authors of this study noted delirium occurred more frequently among patients undergoing major surgeries like a radical cystectomy versus other, less invasive urologic surgeries (Ha et al., 2018). The authors also found that the prevalence rate of delirium among radical cystectomy patients was higher than previous studies due to the larger sample utilized for the study (Ha et al., 2018). Moskowitz et al. (2017) had a much higher prevalence rate of delirium among the sample in their study, however this sample was composed of patients undergoing different types of surgeries, all classified as major surgeries. The sample examined by Moskowitz et al. (2017) was also smaller, composed of 172 patients, and from one site compared to the sample of 165,387 patients and 490 sites studied by Ha et al. (2018). Both of these studies explore delirium rates among surgical patients, but due to the sampling, methods, and patient characteristics the rates of delirium were different. Both of these studies do lend support to the understanding of delirium among surgical

patients. While Ha et al. (2018) studied a large sample with a relatively low rate of delirium, the authors did find that major surgeries had a higher rate of delirium which is a finding consistent with Moskowitz et al. (2017), although not to the same degree. Moskowitz et al. (2017) also specifically examined delirium among patients undergoing major surgeries who were admitted to the intensive care unit (ICU) during their post-operative care period while Ha et al. (2018) examined patients in all care areas. The care area that a patient is admitted to may have a contributing influence on developing delirium among patients.

Patients can be admitted to specialty care areas such as the ICU for treatment of critical illness or post-operative care. Rates of delirium among patients in the ICU appear to be higher than other acute care areas. Delirium prevalence among ICU patients ranges from 64%, 71.8%, and 16% to 89% (Krewulak, Stelfox, Leigh, Ely, & Fiest, 2018; Peterson et al., 2006; Zaal & Slooter, 2012). Delirium rates among patients experiencing major surgeries with admission to the ICU range from 44% to 76% (Moskowitz et al., 2017; Ha et al., 2018). These prevalence rates vary and are based off of meta-analysis, large cohort studies, and large multi-center studies. The authors of a meta-analysis focused on the prevalence of delirium and delirium sub-types among patients in the ICU noted a wide range in prevalence rates between examined studies (Krewulak et al., 2018). Krewulak et al. (2018) determined that these ranges in prevalence rates were attributed to the variety of delirium assessment methods, time intervals, and that delirium was being masked by interventions (such as mechanical ventilation which interfered with accurate assessments of delirium). Krewulak et al. (2018) support the idea that delirium remains common in the ICU. A systematic review of literature concerning delirium among ICU patients found that the wide prevalence rate range of delirium in the ICU (16% to 89%) was due to differing delirium detection tools or technique (Zaal & Slooter, 2012). Despite the wide range in delirium

prevalence, Zaal & Slooter (2012) support the idea that delirium is a common problem in the ICU. The studies utilizing large samples and multi-center samples were able to establish higher delirium prevalence rates among ICU patients due to thorough use of delirium detection assessments (Peterson et al., 2006; Ha et al., 2018). Delirium rates among ICU patients appear to be high when a standardized delirium assessment tool is utilized by healthcare professionals. Delirium prevalence rates among patients admitted to the ICU vary; however, it would be appropriate to consider delirium a relatively common problem among ICU patients.

Delirium is also problematic outside of the hospital setting in subacute care, long term care, and skilled nursing facilities. Long term care areas provide (at minimum) supervision, medication management, and assistance with day-to-day activities for adult patients, while subacute and skilled nursing care areas provide rehabilitation care and 24-hour nursing care for patients requiring additional support and resources that would otherwise be unavailable to patients in the community (Clegg, Siddiqi, Heaven, Young, & Holt, 2014). Subacute care facilities (SACFs), long term care facilities (LTCFs), and skilled nursing facilities (SNFs) are often utilized by patients after discharge from a hospital or acute care facility. Delirium rates also vary in these care areas. Authors of studies concerning patients with delirium in SACFs, LTCFs and SNFs have found prevalence rates at 46.9% and 28.2% (Kolanowski et al., 2015; Ritter et al., 2018). These prevalence rates are based off of multi-site cohort studies. Prevalence rates of delirium in SACFs, LTCFs, and SNFs have been difficult to determine due to under recognition of delirium and heterogenous delirium assessment standards (Ritter et al., 2018). Patients could experience factors that contribute to the development of delirium while in a non-acute care or non-hospital setting which could lead to similar delirium prevalence rates as hospitalized patients

(Kolanowski et al., 2015). Further studies or systematic reviews of literature concerning delirium and patients in SACFs, LTCFs, SNFs is warranted.

The prevalence of delirium varies based on the care area as well as the intervention or treatment that is provided to the patient. The ICU appears to have the highest prevalence of delirium based on existing literature, followed by acute care areas and then SACFs, LTCFs, and SNFs. The variety in prevalence rates is attributed to the heterogeneity of delirium detection methods and study types (Clegg et al., 2014; Peterson et al., 2006; Krewulak et al., 2018). While standardized assessments for delirium do exist, it appears that the detection of delirium is missed or misdiagnosed in up to 70% of hospitalized patients and up to 60% of patients in SACFs, LTCFs, and SNFs (Miller, 2008; Voyer et al., 2012). Delirium is an insidious problem that affects patients both within and outside of the hospital. The consequences of delirium also present a major toll on the patients experiencing it as well as health systems.

Risk Factors and Precipitating Factors for Delirium

There are multiple factors that can contribute to the development of acute delirium among patients. These factors can be divided into two separate groups, one being risk factors, or patient characteristics that can increase the risk of developing delirium, and the other being precipitating factors, which are characteristics present or introduced to patients in healthcare settings that contribute to the development of delirium (Holle & Rudolph, 2018). Risk factors for delirium can be further subdivided into the categories of predisposing patient characteristics and chronic pathologies (Zaal, Devlin, Peelen, & Slooter, 2015).

Predisposing patient characteristics and chronic pathologies.

The main and most important predisposing patient characteristics for the development of delirium is age, specifically advanced age (Zaal & Slooter, 2012). Advanced age is defined as

being 65 years or older (Zaal & Slooter; Zaal et al., 2015; Kubota et al., 2018). According to Zaal and Slooter (2012), the risk of developing delirium while in the ICU increases by 2% for each additional year of age beyond 65. Authors of a systematic reviews focused on risk of delirium found that there was strong evidence supporting advanced age as the main predisposing characteristic for developing delirium across the reviewed literature (Zaal et al., 2015). A large retrospective cohort study found that the odds for developing delirium were 12.95 in patients 75 years or older who had been hospitalized for five or more days compared to patients from other age groups (Kubota et al., 2018). There is agreement and strong evidence in the literature that supports the claim that advanced age is the main predisposing patient characteristic for developing delirium.

Chronic pathologies are defined as existing cognitive impairment (dementia or Alzheimer's disease), drug misuse (alcohol, opiate, or benzodiazepine misuse), and chronic diseases (hypertension and diabetes) (Zaal et al., 2015). According to Zaal et al. (2015), among the chronic pathologies existing, cognitive impairment has a high association with developing delirium. Existing cognitive impairment (specifically dementia) is associated with a higher risk of developing delirium both in the hospital and long term care settings according to Gaul et al. (2018). In the long term care setting, dementia was the main risk factor for developing delirium with a hazard ratio of 5.2 according to the authors of a cohort study (Gaul et al., 2018). According to Zaal et al. (2015), drug misuse has a varying association with the development of delirium. Alcohol withdrawal has a characteristic form of delirium, called delirium tremens, which has a different etiology than acute delirium (Zaal & Slooter, 2012). Hypertension has been shown to be associated with the development of delirium, but a causal inference has not been determined (Zaal et al., 2015). Other researchers examining risk factors associated with delirium

have not been able to support association between delirium and hypertension (Kubota et al., 2018). Of all of the chronic pathologies, existing evidence has strong support for dementia having the highest association as risk a for developing delirium according to the authors of systematic reviews and large cohort studies (Zaal et al., 2015; Kubota et al, 2018; Gual et al., 2018).

Precipitating factors.

Precipitating factors that increase the risk of developing delirium include coma, delirium in the previous day of hospitalization, emergency surgery, mechanical ventilation, multiple traumatic injuries, metabolic derangements, use of physical restraints, admission to an ICU, and the administration of deliriogenic drugs (Zaal et al., 2015).

Presence of altered level of consciousness resulting in coma has a high association with subsequent delirium as does having delirium in the prior days of a patient's hospitalization, according to a systematic review by Zaal et al. (2015). According to the authors of this systematic review, there is strong evidence supporting the development of delirium after experiencing fluctuation in cognition and mental status associated with coma and prior delirious episodes (Zaal et al., 2015).

Emergency surgeries, mechanical ventilation, and multiple traumatic injuries are all highly associated with the development of delirium in critically ill patients (Zaal et al., 2015). Each of these precipitating factors represent tremendous physiologic insult to the patient and often require intense intervention including the provision of deliriogenic medications (such as analgesics and sedatives) (Zaal & Slooter, 2012; Zaal et al., 2015).

Metabolic derangements are products of metabolic processes that are out of normal ranges as a result of a disease process such as dehydration, sepsis, hyperglycemia, or renal failure

(Kubota et al., 2018). Metabolic acidosis was highly associated with subsequent development of delirium, while other metabolic derangements had an inconclusive association (Zaal et al., 2015). Kubota et al. (2018) were able to examine other metabolic derangements through a large cohort study and found multiple electrolyte and metabolic abnormalities present in patients with delirium. These derangements in metabolism could also arise from critical illness, so their association with developing delirium remains inconclusive Zaal et al. (2015).

The intention of physical restraints are to restrict a patient's movement in order to maintain the safety of the patient or healthcare staff, or maintain the integrity of therapies provided to the patient (such as intravenous therapies or mechanical ventilation) (Pan et al., 2018). Use of restraints and delirium form a reciprocal relationship in that presence of delirium can lead to restraint use, and restraint use has the potential to lead to delirium (Pan et al., 2018). Studies examining restraint use and development of delirium found that increased use of restraints and increased time restrained was associated with a higher risk of developing delirium (odds ratio 3.69 and 3.62 respectively) (Kubota et al., 2018; Pan et al., 2018). These cohort studies do support the relationship of restraint use and development of delirium; however, further studies would help to strengthen this association.

ICU admission can allow for compounding precipitating factors to occur, increasing delirium risk among patients. These precipitating factors, aside from critical illness, are sleep disturbances including sleep deprivation, high noise levels, unpleasant sensations, and lack of sunlight or lack of darkness at night (Medrzycka-Dabrowska, Lewandowska, Kwiecien-Jagus, & Czyz-Szypenbajl, 2018; Zaal et al., 2015). Disorders of sleep leading to sleep deprivation are common for patients during hospitalization (Medrzycka-Dabrowska et al., 2018). Sleep deprivation and sleep fragmentation during hospitalization are attributed to environmental factors

such as noisy care areas (related to physiologic monitors, other patients, visitors, and staff) and medical and nursing tasks (Medrzycka-Dabrowska et al., 2018). A systematic review focusing on sleep deprivation found that environmental noises were responsible for up to 17% of sleep disruptions among patients and noise levels exceeded standard levels set by the World Health Organization (WHO) (Medrzycka-Dabrowska et al., 2018). The WHO recommend in 1999 that noise does not exceed 35 decibels in patient care areas (Medrzycka-Dabrowska et al., 2018). When noise was measured in patient care areas, it exceeded 55 decibels up to 90% of the time (Medrzycka-Dabrowska et al., 2018). Medrzycka-Dabrowska et al. (2018) also determined that patients were unable to obtain adequate sleep due to nursing care tasks occurring at disruptive intervals. Exposure to sunlight during day time and darkness during night time allows for the maintenance of circadian rhythm and deprivation of sunlight or darkness can lead to a disruption of circadian rhythm, appropriate sleeping cycles, and eventually can lead to delirium (Luther & McLeod, 2017). Restriction from sunlight alone does not appear to have a high association with the development of delirium according to the authors of a systematic review focused on delirium risk factors (Zaal et al., 2015). Sleep deprivation, however, does have a high association with the development of delirium, and there is noted relationship between sleep and sunlight deprivation increasing the risk of developing delirium according to the authors of a systematic review (Medrzycka-Dabrowska et al., 2018).

Deliriogenic drugs are medications associated with contributing to the development of delirium (Zaal & Slooter, 2012). Deliriogenic drugs include sedatives (benzodiazepines), analgesics (opiates), anticholinergics (diphenhydramine), and vasoactive medications (dopamine) (Hayhurst, Pandharipande, & Hughes, 2016). According to the authors of a review of delirium risks, each of these medications have routine use in the hospital and ICU (Hayhurst et

al., 2016). A systematic review focused on delirium risk factors found a wide breadth of literature with low to high association for developing delirium among the deliriogenic drugs (Zaal et al., 2015). Due to the variability of the results of the literature, and the heterogeneity of the metrics used when assessing the link of these drugs to delirium, Zaal et al. (2015) were unable to determine the strength of the literature. Despite the variability of the results of the literature, delirium risk clinical guidelines agree that deliriogenic drugs should either be avoided or used sparingly with patients at high risk for developing delirium (Hayhurst et al., 2016).

There are multiple known risk factors for developing delirium. Two of these risk factors, age and history of dementia, have the strongest association with developing delirium and are also non-modifiable (Zaal et al., 2015). Many of the predisposing risk factors that have strong to tenuous association with developing delirium can be modified or avoided in order to reduce the risk of patients developing delirium (Zaal et al., 2015). According to Zaal et al. (2015), the reduction of the risk for patients developing delirium relies on understanding the risk factors associated with developing delirium, utilizing standard delirium assessments among all patients at risk for developing delirium, and implement appropriate delirium preventive measures.

Assessment of Delirium

The gold standard for diagnosing delirium is through an evaluation by a psychiatrist using Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria (Hayhurst et al., 2016). Current delirium management guidelines recommend routine, often times daily, assessment for delirium (Barman et al., 2018). Unfortunately, the routine use of psychiatric resources for the assessment and diagnosis of delirium is infeasible (Hayhurst et al., 2016). A wide variety of delirium screening tools have been developed in order to fulfill the need for routine delirium assessment for use by an array of health personnel (Hayhurst et al., 2016). One

of the most widely used delirium screening tool is the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) (Gusmao-Flores, Salluh, Chalhub, & Quarantini, 2012).

CAM-ICU.

The CAM-ICU was developed by Ely et al. (2001) as a means to routinely screen for delirium in ICU patients. The CAM-ICU was adapted from DSM delirium diagnostic criteria for use among healthcare personnel with little or no psychiatric training (Ely et al., 2001). The CAM-ICU assessment consists of four features that rely on the assessor's subjective assessment of the patient and the patient's ability to respond and answer a brief sequence of questions centered on inattention and disorganized thinking (Ely et al., 2001). The CAM-ICU was developed to be completed within about 5 minutes and so that patients could respond verbally or nonverbally as is the case with patients who are mechanically ventilated (Ely et al., 2001). The initial sensitives and specificities of the CAM-ICU when used by two nurses were 100% and 93.5% and 97.8% and 100% respectively (Ely et al., 2001). Interrater reliability was found to be excellent (k=0.96, 95% CI, 0.92-0.99) (Ely et al., 2001). The initial validation trials of the CAM-ICU were compared to the gold standard psychiatric evaluation for delirium (Ely et al., 2001).

In a systematic review and meta-analysis focused on comparing the CAM-ICU to another delirium assessment, the Intensive Care Delirium Screening Checklist (ICDSC), found that the CAM-ICU had a pooled sensitivity and specificity of 80% and 95.9% respectively compared to the pooled sensitivity and specificity of the ICDSC, which was 74% and 81.9% (Gusmao-Flores et al., 2012). According to Gusmao-Flores et al. (2012), the CAM-ICU is an excellent tool for the detection of delirium in ICU patients.

The validating study for the CAM-ICU was a moderately sized, single-site cohort study, and while the sensitivity and specificity results were both high and promising, further

examination of the CAM-ICU and its effectiveness in assessing for delirium was warranted (Ely et al., 2001). Gusmao-Flores et al. (2012) were able to examine nine studies focused on the use of the CAM-ICU and compare the effectiveness to four studies focused on the ICDSC. Gusmao-Flores et al. (2012) support the conclusion that the CAM-ICU is one of the best tools available to healthcare professionals for the detection of delirium.

Barriers toward detecting delirium.

Without a delirium screening tool available, it is estimated that ICU physicians miss up to 75% of delirium cases (Zaal & Slooter, 2012). Availability of a delirium assessment tool like the CAM-ICU does not ensure the use of the tool for the routine screening of delirium in patients. According to studies concerning perceptions of delirium among critical care clinicians, nurses and physicians consider delirium an important issue but believe that it is under-diagnosed or under-assessed suggesting an inconsistency between perceived importance and current practices (Oxenbøll-Collet et al., 2016).

When surveyed, nurses and physicians reported that they had an adequate understanding of delirium as it occurs among critically ill patients as well as an understanding of the consequences of delirium among these patients (Devlin et al., 2008; Elliott, 2014; Nydahl, et al., 2017). A recurring response that arose in each of the surveys was the lack of understanding concerning timing of delirium screening, and most respondents provided the delirium assessment only when they had a suspicion of delirium and not on a set interval as most delirium prevention guidelines suggest (Devlin et al., 2008; Elliott, 2014; Nydahl, et al., 2017). Another similar response that arose from the surveys was the respondents' lack of knowledge of a validated delirium assessment tool (Devlin et al., 2008; Elliott, 2014; Nydahl, et al., 2017). Respondents stated that they instead provided a subjective delirium assessment centered around whether or

not they felt delirium was present in their patient (Devlin et al., 2008; Elliott, 2014; Nydahl, et al., 2017). Other barriers to providing delirium screening include the clinician's perception that the patient is unable to participate in the screening process (due to sedative effects or mechanical ventilation) and that patients are too unstable to participate (Devlin et al., 2008; Elliott, 2014; Nydahl, et al., 2017). Of note, respondents to surveys by Devlin et al. (2008) Elliot (2014) stated that the delirium assessments were not time-consuming, while respondents to the survey provided by Nydahl et al. (2017) found that many clinicians felt that the delirium assessments were too time-consuming.

The author of a literature review focused on the barriers to delirium assessment had agreeable findings to the surveys (Rowley-Conwy, 2017). The main individual barriers to providing delirium assessment were lack of knowledge of or confidence in using a validated delirium screen and a perception that the delirium screen was too complicated to use (Rowley-Conwy, 2017). This perception of lack of understanding or high complexity is unclear as the two widely used delirium screening tools, the CAM-ICU and ICDSC, are known for their simplicity (Rowley-Conwy, 2017). The patient-related barriers concerning inability to participate due to illness severity or perceived inability to communicate were also found in this literature review (Rowley-Conwy, 2017). While Rowley-Conwy (2017) could not answer to perceived severity of illness by clinicians, the author did note that the CAM-ICU and ICDSC were both developed to allow for the assessment of delirium in patients who were either verbal or nonverbal. It is unclear as to why this was also considered a barrier by clinicians (Rowley-Conwy, 2017). The author of the literature review also found that many clinicians did not find delirium assessments to be particularly time-consuming, though they did state that they were complex (Rowley-Conwy, 2017). Several barriers to delirium assessment were described by Rowley-Conwy (2017) that

were centered around the work environment and interactions with other clinicians. Nurses felt that they did not have support from clinical leadership to assess for and report delirium, or that they did not attempt to perform the delirium screen because they felt that a positive result would not lead to a beneficial response for the patient from physicians (Rowley-Conwy, 2017).

The studies focused on providing delirium assessment are mostly surveys and literature reviews concerning the perceptions of clinicians. There appears to be a gap between understanding the problem that is delirium in patients and assessing for delirium. These surveys do provide some information regarding the disparity between delirium and the assessment for delirium. Unfortunately, these surveys concerning delirium assessment are unable to provide strong evidence of the barriers to delirium assessment due to their relatively small size and heterogenous methods. Further studies in the form of observational studies or systematic reviews would help to better understand the barriers to assessing for delirium. The results of the surveys appear to be similar and are somewhat corroborated through a literature review, however a systematic review or meta-analysis would strengthen the understanding of the barriers to delirium assessment. More robust studies would help to extend the knowledge surrounding barriers to delirium assessment.

The Consequences of Delirium

Delirium can cause multiple problems for patients experiencing it. Measures indicating negative consequences for patients experiencing delirium include: mortality rate, length of stay (LOS), and cost of care. Authors examining mortality rates among hospitalized patients experiencing delirium found an adjusted mortality odds ratio of 3.18 in a single site acute care hospital, another multi-hospital study found a mortality odds ratio of 2.56 with patients experiencing delirium (Schubert et al., 2018; Morandi et al., 2018a). Zhang, Pan, and Hongying

(2012) examined mortality rates among hospitalized patients experiencing delirium through a meta-analysis and found three studies with results showing that patients with delirium were no more likely to die compared to patients without delirium and another nine studies showing that patients with delirium were three times more likely to die during hospitalization. Schubert et al. (2018) found that patients with delirium had a median LOS of 13 days while patients without delirium had a median LOS of 7 days, while Morandi et al. (2018a) found that patients with delirium had a median LOS of 15 days and patients without delirium had a median LOS of 12 days. Zhang et al. (2012) examined ICU and hospital LOS through their meta-analysis and found that with patients with delirium had a weighted mean difference ICU LOS of 7.32 days and a weighted mean difference hospital LOS of 6.53 days compared to patients without delirium. It is estimated that delirium costs $4 to $16 billion dollars annually in the United States (US) alone according to the authors of a delirium scoping review (Hsieh, Ely, & Gong, 2013). Median hospital costs associated with managing a patient with delirium were also elevated compared to patients without delirium costing an additional 23,000 (currency in Swiss francs) (Schubert et al., 2018). The authors of a single-site cohort study examining costs caused by patients with delirium in the ICU found that the mean incremental cumulative ICU cost related to persistent delirium survivors was $17,838 with the highest costs occurring after the first week of critical illness (Vasilevskis et al., 2018). The authors of this study also noted that if a patient with delirium survived their initial critical illness, the cost of hospitalization would increase by about 20% to approximately $20,000 (Vasilevskis et al., 2018). It is clear that the increased mortality rate, LOS, and hospital costs are increased among patients experiencing delirium. Large single and multi-site cohort studies have examined the mortality rates of patients with delirium showing similar results, while a meta-analysis found some conflicting results due to heterogenous

delirium assessment methods, however the majority of studies found a high mortality rate among patients with delirium (Schubert et al., 2018; Morandi et al., 2018a; Zhang et al., 2012). ICU and hospital LOS was found to be higher in the cohort studies and meta-analysis (Schubert et al., 2018; Morandi et al., 2018a; Zhang et al., 2012). The single and multi-site cohort studies reviewing hospital costs found an increase in costs associated with managing patients with delirium (Schubert et al., 2018; Vasilevskis et al., 2018). Determining fixed costs for delirium was noted to be difficult by the authors of these studies due to the variability of healthcare costs by country and region in which these studies took place (Schubert et al., 2018; Vasilevskis et al., 2018).

The mortality odds among surgical patients experiencing delirium were found to be 3.71 compared to surgical patients who had not experienced delirium (Ha et al., 2018). The results of another study examining the 5-year mortality rate of surgical patients found a mortality odds ratio of 7.35 among patients who had experienced delirium compared to surgical patients who had not experienced delirium (Moskowitz et al. 2017). Ha et al. (2018) found that surgical patients with delirium had an increase in LOS by about one day while Moskowitz et al. (2017) found that patients with delirium remained in the ICU for an additional two days. Ha et al. (2018) also found that hospital costs were increased by about $2,600 for patients experiencing delirium. Costs were further increased by about $4,000 for patients experiencing delirium after radical cystectomies (Ha et al., 2018). The mortality rates, LOS, and hospital costs associated with surgical patients experiencing delirium were determined through a single-site cohort study and a large multi-site cohort study. The high mortality rate, increased LOS, and higher costs among the surgical patients found between these two studies is evidence that delirium prevention management should be a focus in this hospitalized patient group.

Among SACF and LTCF patients experiencing delirium higher mortality rates have been observed. A single-site study performed at a SACF found that of the patients experiencing delirium 10% were deceased within 30 days of discharge (Gaul et al., 2018). According to Gaul et al. (2018) LOS was slightly elevated among patients with delirium at 0.3 days. The authors of this study did not determine a specific dollar amount related to the impact of delirium on healthcare costs. Gaul et al. (2018) noted that there have been few studies examining delirium and its impact among patients in SACFs, LTCFs, and SNFs and that further studies in this patient population are warranted.

Delirium as it occurs in the hospital has received a great deal of attention; among hospitalized patients experiencing delirium, there are higher mortality rates, longer LOS in both the ICU and hospital , and increased costs (Schubert et al., 2018; Morandi et al., 2018a; Hsieh, Ely, & Gong, 2013). Each of these problems justifies implementing methods to educate healthcare providers and caregivers about delirium and implementing methods to assess for and manage delirium. Delirium as it occurs outside of the hospital in SACFs, LTCFs, and SNFs has received less attention, though it appears to be problematic for patients regardless of care setting. Continued research of delirium in these facilities would help to expand the understanding of delirium and its associated consequences.

The Prevention of Delirium

Due to the complex nature of delirium, its prevention requires an aggressive, multi-faceted approach (Kang et al., 2018). Unfortunately, treatment, rather than recognition, assessment, and prevention, is the most usual approach to delirium management (Herling et al., 2018). This reactive approach to delirium management is related to infrequent, routine delirium screening by clinicians and insufficient adoption of delirium prevention and treatment clinical

practices (Herling et al., 2018). Delirium prevention and management can be categorized into pharmacological and nonpharmacological groups.

Pharmacological prevention and management of delirium.

Agitation associated with delirium has often been treated through the use of atypical antipsychotics like haloperidol (Devlin et al., 2018). Due to the effectiveness of treating agitation associated with delirium through the use of atypical antipsychotics, these drugs have been tested as a potential method for preventing delirium (Herling et al., 2018). A systematic review of the use of antipsychotics for delirium prevention performed by Herling et al. (2018) found that among four large randomized control trials comparing atypical antipsychotics to placebo groups, there was no difference in in-hospital mortality, delirium-free days, or length of hospitalization. Each of these trials were considered moderate to high-quality evidence by the authors of the systematic review (Herling et al., 2018). Another type of non-narcotic sedative, dexmedetomidine, has also been suggested to reduce the severity of agitation associated with delirium in patients who are mechanically ventilated (Devlin et al., 2018). A single, small randomized control trial comparing dexmedetomidine to a placebo found a reduction in ventilator free hours (used as a proxy for reduction in agitation associated with delirium), however the trial and study were not completed (Devlin et al., 2018). Dexmedetomidine has not yet been associated with preventing delirium in general ICU patients who are mechanically ventilated (Devlin et al. 2018). Currently there are no pharmacological clinical guidelines for the prevention of delirium in ICU patients (Devlin et al., 2018). The key to preventing delirium may lie in nonpharmacological interventions.

Nonpharmacological prevention and management of delirium.

Nonpharmacological delirium prevention and management strategies were developed with the intention of applying them to every ICU patient regardless of diagnosis or intervention type (Pun et al., 2018). These strategies focus on symptom assessment, prevention, and management and can be implemented in conjunction with other life-sustaining therapies or interventions (Pun et al., 2018). An example of a multicomponent, nonpharmacological delirium prevention and management strategy is the ABCDEF bundle (Pun et al., 2018). According to Pun et al. (2018) the ABCDEF bundle consists of routine pain assessment, prevention, and management, both spontaneous awakening and breathing trials for mechanically ventilated patients, choosing appropriate analgesia and sedation, routine structured delirium assessment, prevention and management, early mobility and exercise, and family engagement/empowerment. According to the authors of a systematic review and meta-analysis of 35 studies examining nonpharmacologic delirium prevention and management strategies, the multicomponent intervention (the ABCDEF bundle) significantly reduced the occurrence of delirium compared all other nonpharmacologic interventions (odds ratio 0.48), however there was not a reduction in the duration of delirium through the use of any of the interventions (Kang et al., 2018). The authors of this meta-analysis examined the quality of 15 studies consisting of randomized control trials, controlled clinical trials, and controlled before and after studies and found seven of them to be of high quality, while the remaining eight studies did not use consistent methods or measures to assure high quality (Kang et al., 2018).

Despite the promise of nonpharmacologic interventions, delirium rates seem to persist at high levels (Morandi et al., 2018a). The authors of a survey attempted to determine the knowledge and use of the ABCDEF bundle among critical care physicians from 47 countries

(Morandi et al., 2018b). Among the 1,521 respondents, 57% had implemented the bundle, 70% implemented a form of delirium monitoring, only 42% used a standardized delirium screening tool, and 42% used protocols for the management of delirium (Morandi et al., 2018b). These are the results of a single, world-wide survey among critical care physicians using a large sample. Since this was a cross-sectional survey of perceptions and behaviors of clinicians and not a study that offers direct observation of clinical practice like an observational study or randomized control trial, the responses would be difficult to generalize to the practices of critical care clinicians. Further studies examining barriers to the adoption and use of the ABCDEF bundle among other types of clinicians (like nurses or pharmacists), would be warranted in order to determine use of and perceived effectiveness of nonpharmacologic methods on delirium prevention and management (Morandi et al., 2018b).

Nonpharmacologic delirium prevention and management strategies appear to be effective in the prevention of delirium among patients in the ICU. Multicomponent strategies like the ABCDEF bundle can reduce the occurrence of delirium without interfering with life sustaining treatments or therapies. It appears, however, that multicomponent, nonpharmacological delirium prevention and management strategies are not consistently adopted or utilized which could account for the continued high prevalence of delirium among ICU patients. An examination of the barriers to delirium recognition, assessment, prevention, and management methods would help to expand the understanding of the persistent rates of delirium.

Delirium Disorder Model

In order to better conceptualize delirium, its various causes, and its associated consequences, the trans-theoretical model of delirium disorder has been developed by Oldham, Flaherty, and Maldonado (2018) (Figure 2).

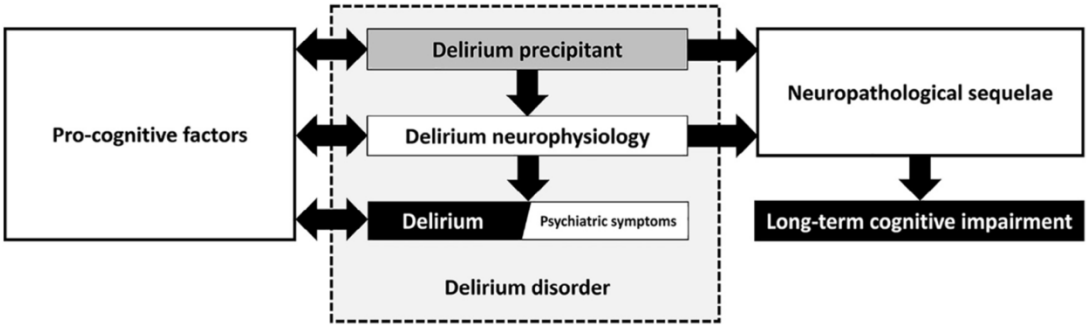

Figure 2. Trans-theoretical model of delirium disorder (Oldham et al., 2018).

The model is divided into three elements highlighting the key relationships and emphasizing the interactions that occur between each element (Oldham et al., 2018). The delirium disorder element focuses on the precipitating factors of delirium, the neurophysiology associated with the development of delirium, and a delineation between delirium and associated psychiatric symptoms (Oldham et al., 2018). The delirium precipitants represent the biological insults experienced by a patient that may lead to neurophysiologic disruption allowing for the development of delirium (Oldham et al., 2018). The distinction between delirium and psychiatric symptoms is displayed in order to describe that, more often than not, the associated symptoms that arise with delirium (aggression, confusion, and delusion) are recognized and treated, rather than delirium itself (Oldham et al., 2018).

The procognitive factors element represents baseline biopsychosocial factors integral to promoting healthy cognitive function which can be used to explain individual resilience or vulnerability to delirium (Oldham et al., 2018). Procognitive factors have an influence on each level of delirium disorder in that they might modify the neurophysiologic impact of precipitants, influence neurophysiologic disturbances (either potentiating, propagating, or mitigating delirium), or if severe enough negative cognitive factors exist, act as an independent delirium precipitant (Oldham et al., 2018). Defining procognitive factors and their influence on delirium

disorder provide the rationale for the use of multicomponent delirium prevention and management interventions (Oldham et al., 2018).

The final element, neuropathological sequalae, represent the consequences of the delirium precipitant and neurophysiology (Oldham et al., 2018). These sequalae may culminate in long-term cognitive and functional impairment as well as a delay or disruption in returning to a functional baseline (Oldham et al., 2018).

Oldham et al. (2018) attempted to refine the broad and nebulous understanding of delirium disorder through the development of this delirium disorder model. While delirium is viewed as a unitary condition with a shared common pathway, there are a variety of risk factors and precipitating factors that influence the development and severity of delirium (Oldham et al., 2018). This model provides a better explanation of delirium as it occurs in patients in the hospital setting, however the greater issues regarding delirium are the lack of delirium recognition, assessment, prevention, and management measures on behalf of critical care clinicians.

Summary

Delirium represents a major threat to patients both in and out of the hospital settings. Currently, the body of knowledge surrounding delirium shows that it is prevalent in many patient care areas (though the highest prevalence is within the ICU), that it is potentially lethal for patients, and incurs a heavy cost burden on health care systems. Additionally, appraisal of current delirium assessment methods and their validity and reliability show that there are effective tools available for clinicians to assess for delirium, but they might not be used by clinicians due to lack of knowledge, lack of confidence, or perceived institutional barriers. Further assessment of delirium prevention and management methods shows that nonpharmacologic delirium prevention and management guidelines, like the ABCDEF bundle,

are effective in preventing delirium. Unfortunately, these prevention and management guidelines are not fully adopted or utilized by critical care clinicians. Further exploration of the barriers to the recognition and assessment of delirium by critical care clinicians is justified.

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Barriers to Delirium Recognition and Assessment Survey

Q1 Delirium- An acute confusional state with attention deficits, disorganized thinking, fluctuating behavior, and altered mental status and/or level of consciousness usually within a 24 hour span.

Q2 The following conditions can occur in an ICU patient. Please RATE the condition by importance in which you feel that it should be evaluated by staff over the average shift.

	Least Important	Slightly Important	Moderately Important	Very Important	Most Important
Altered level of consciousness	○	○	○	○	○
Improper placement of invasive devices	○	○	○	○	○
Presence of agitation	○	○	○	○	○
Presence of delirium	○	○	○	○	○
Presence of pain	○	○	○	○	○

Q3 The following conditions can occur in an ICU patient. Please RANK each in importance in which you feel they should be evaluated by staff over the average shift. '1' indicates LEAST important to evaluate, a '5' indicates the MOST important to evaluate.

_____ Altered level of consciousness
_____ Improper placement of invasive devices
_____ Presence of agitation
_____ Presence of delirium
_____ Presence of pain

Q4 Who should be responsible for delirium assessment in your ICU/care area? (Select one)

- ○ Nurse Practitioners
- ○ Physicians
- ○ Physician's Assistants
- ○ Physical Therapists
- ○ Physical Therapist Assistants
- ○ Registered Nurses
- ○ Respiratory Therapists
- ○ All of the above
- ○ Not sure

Q5 For the ICU patients whom you care for, how often do you evaluate for the presence of delirium?

- ○ Never
- ○ Rarely
- ○ Frequently
- ○ Always

Q6 For the ICU patients for whom you DO evaluate for the presence of delirium, please indicate the frequency per every 12-hour shift that you conduct an evaluation. For example if you usually evaluate for the presence of delirium twice per shift then select "x 2-3".

	Never	x 1	x 2-3	x 4-6	x >6
Evaluate for delirium per 12 hour shift	○	○	○	○	○

Q7 Studies have shown that delirium can occur at a variety of rates among ICU patients. Reflecting on your career in the ICU, what do you feel is the rate at which your patients experience delirium? (Please select an estimated percent)

	0 10 20 30 40 50 60 70 80 90 100
Percent of patients who experience delirium	

Q8 For the ICU patients for whom you evaluate the presence of delirium, please indicate how frequently you use **each** of the following in your delirium assessment. Note: Please indicate frequency per every 12-hour shift. If you do not assess for delirium in your ICU patients, please indicate "never use" in each column.

	Never Heard Of	Never Use	Rarely	x 1	x 2-3	x 4-6	x >6
Evaluate Ability to Follow Commands	○	○	○	○	○	○	○
Evaluate Orientation Level	○	○	○	○	○	○	○
Confusion Assessment Method-ICU (CAM-ICU)	○	○	○	○	○	○	○
Psychiatry Consult	○	○	○	○	○	○	○
Agitation Related Events/Richmond Agitation Sedation Scale (RASS)	○	○	○	○	○	○	○

Q9 Do you agree with the following statements? Please RATE each factor based on your level of agreement.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Delirium assessment tools are too complex to use	○	○	○	○	○
Assessment tools are difficult to interpret in intubated patients	○	○	○	○	○
I do not feel confident in my ability to use delirium assessment tools	○	○	○	○	○
I do not feel that using delirium assessment tools improves outcomes	○	○	○	○	○
I am unable to adequately document delirium assessments	○	○	○	○	○
Not enough time to perform assessment (too time consuming)	○	○	○	○	○
I am not required to screen for delirium in my	○	○	○	○	○

ICU/care area					
Other clinicians already complete delirium assessments	○	○	○	○	○
Other clinicians do not use my assessment in their decision-making	○	○	○	○	○

Q10 Do you agree with the following statements? Please RATE each factor on your level of agreement.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Delirium is an under-assessed problem.	○	○	○	○	○
Delirium is a common response in the ICU environment.	○	○	○	○	○
Delirium is associated with higher patient mortality.	○	○	○	○	○
ICU patients with delirium are rarely agitated.	○	○	○	○	○

Delirium is challenging to assess in ICU patients.	○	○	○	○	○
Delirium treatment requires active interventions by care clinicians.	○	○	○	○	○
Patients with delirium usually have symptoms that are consistent over the entire shift.	○	○	○	○	○
The presence of delirium interferes with my ability to provide patient care.	○	○	○	○	○
The presence of delirium increases my workload.	○	○	○	○	○
Initiation of antipsychotic therapies (e.g. Haloperidol, Olanzapine, Quetiapine) should be the initial intervention for all patients with delirium.	○	○	○	○	○
Delirium is reversible.	○	○	○	○	○

Delirium has multiple risk factors.	○	○	○	○	○

Q11 Please RATE your level of distress (feelings of stress, worry, or upset) when caring for a patient who is experiencing delirium.

- ○ Not Distressing
- ○ Slightly Distressing
- ○ Moderately Distressing
- ○ Very Distressing
- ○ Extremely Distressing

Q12 Have you cared for a patient who had either a suspected or confirmed COVID-19 infection?

- ○ Yes
- ○ No

Q13 Among patients who had either a suspected or confirmed COVID-19 infection please RATE how important it was for you to assess for the presence of delirium.

- ○ Not at all Important
- ○ Slightly Important
- ○ Moderately Important
- ○ Very Important
- ○ Extremely Important

Q14 Among patients who had either a suspected or confirmed COVID-19 please RATE your prioritization of providing delirium assessments and interventions over other types of assessments and interventions.

- ○ Not a Priority
- ○ Low Priority
- ○ Moderate Priority
- ○ High Priority
- ○ Highest Priority

Q15 Among patients who had either a suspected or confirmed COVID-19 please RATE the level by which you felt that your ability to provide delirium assessments and interventions was interfered with.

- ○ Not at all interfered with
- ○ Low interference
- ○ Moderate interference
- ○ High interference
- ○ Totally interfered with

Q16 Among patients who were a suspected or confirmed to have COVID-19 AND were experiencing delirium please RATE your level of distress (feelings of stress, worry, or upset) when caring for them.

- ○ Not Distressing
- ○ Slightly Distressing
- ○ Moderately Distressing
- ○ Very Distressing
- ○ Extremely Distressing

Q17 Did patients who either had a suspected or confirmed COVID-19 infection have a higher occurrence of delirium than other ICU patients, in your opinion?

- ○ Lower than other patients
- ○ About the same as other patients
- ○ Higher than other patients

Q18 If you were to care for a patient who had either a suspected or confirmed COVID-19 infection please RATE how important it would be for you to assess for the presence of delirium.

- ○ Not at all Important
- ○ Slightly Important
- ○ Moderately Important
- ○ Very important
- ○ Extremely important

Q19 If you were to care for a patient who had either a suspected or confirmed COVID-19 infection please RATE your prioritization of providing delirium assessments and interventions over other types of assessments and interventions.

- ○ Not a Priority
- ○ Low Priority
- ○ Moderate Priority
- ○ High Priority
- ○ Highest Priority

Q20 If you were to care for a patient who had either a suspected or confirmed COVID-19 infection please RATE the level by which you would feel that your ability to provide delirium assessments and interventions could be interfered with.

- ○ Not at all interfered with
- ○ Low interference
- ○ Moderate interference
- ○ High interference
- ○ Totally interfered with

Q21 If you were to care for a patient who had either a suspected or confirmed COVID-19 infection AND the patient were to experience delirium please RATE your level of distress (feelings of stress, worry, or upset) when caring for them.

- ○ Not Distressing
- ○ Slightly Distressing
- ○ Moderately Distressing
- ○ Very Distressing
- ○ Extremely Distressing

Q22 Do you feel that patients who either had a suspected or confirmed COVID-19 infection could have a higher occurrence of delirium than other ICU patients?

- ○ Lower than other patients
- ○ About the same as other patients
- ○ Higher than other patients

Q23 What is your age?

- ○ 18 - 24
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64
- ○ 65 - 74
- ○ 75 - 84
- ○ 85 or older

Q24 Please specify the gender that you identify as:

- ○ Male
- ○ Female
- ○ Other (please specify): _____

Q25 Please specify the ethnicity that you identify as: (Select all that apply)

- [ ] African American/Black
- [ ] Asian
- [ ] Caucasian/White
- [ ] Hispanic/Latinx
- [ ] Native American or Alaskan Native
- [ ] Native Hawaiian or Other Pacific Islander
- [ ] Other (please specify): _____

Q26 What is the highest degree or level of education that you have completed? (Select one)

- ○ Certificate/diploma
- ○ Associate's Degree
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ PhD
- ○ DNP
- ○ MD/DO
- ○ Other Doctorate

Q27 What is your current role in the ICU? (Select one)

- ○ Nurse Practitioner
- ○ Physical Therapist
- ○ Physical Therapist Assistant
- ○ Physician-Attending
- ○ Physician-Fellow
- ○ Physician-Intern
- ○ Physician-Resident
- ○ Physician's Assistant
- ○ Registered Nurse
- ○ Respiratory Therapist

Q28 How long have you been in your current role?

- ○ 6 months to 1 year
- ○ 1 to 2 years
- ○ 2 to 4 years
- ○ 5 to 9 years
- ○ 10 to 15 years
- ○ 16 to 20 years
- ○ 20 or more years

Q29 What is the main ICU that you work in, or area of specialty? (Select one)

- Burn ICU
- Cardiac ICU
- Cardiothoracic ICU
- Medical ICU
- Medical Surgical ICU
- Neurosurgical ICU
- Surgical ICU
- Variable/Float

Q30 My main ICU/care area has a delirium screening procedure.

- Yes
- No
- Not Sure

Q31 Does your delirium screening procedure specify a frequency by which delirium should be assessed?

- Yes
- No
- Not Sure

Q32 I have received education regarding delirium assessment by the following means: (Please select ALL applicable boxes below)

- ☐ Have never received education
- ☐ Orientation for current role
- ☐ Other hospital or health system
- ☐ Teaching at the bedside/in-service
- ☐ School

Q34 Please provide your name and email if you wish to participate in a focus group session. Your name and email will not be associated with your responses. You may skip this item if you do not wish to provide your information.

- ○ Name _____
- ○ Email _____

Q33 Please provide your name and email if you wish to be entered into the raffle. Your name and email will not be associated with your responses. You may skip this item if you do not wish to provide your information.

- ○ Name _____
- ○ Email _____

Adapted from:

Devlin, J., Fong., J., Howard, E., Skrobik, Y., McCoy, N., Yasuda, C., & Marshall., J. (2008).

Assessment of delirium in the intensive care unit: Nursing practices and perceptions.

American Journal of Critical Care, 17(6), 555-565.

Focus Group Interview Guide

Introduction Statement

Thank you all for participating in this focus group session. We will be discussing sensitive topics surrounding patient care, so I would like to request that every person respects each other's privacy and not repeat what was said today. Also, please do not use your name, patients' names, other clinicians' names, or the name of the organization during this session.

I. Recognizing and assessing for delirium in the ICU

Scenario: A 70 year-old male is admitted to the ICU with shortness of breath, a productive cough, fever, and altered mental status. The patient has had these symptoms for about 3 days. A chest x-ray shows consolidation to the right lower lobe. The patient has had low oxygen saturation on room air. In the ED, the patient was placed on full-face bipap, his oxygen saturation improved, and his shortness of breath subsided. About four hours after admission to the ICU, the patient became agitated and was claiming that he was being held against his will in a prison. Bedside staff calmed him with redirection and reorientation, and about a half hour later he became obtunded and was arousable only to painful stimulus. The patient's vital signs did not have any significant change with the patient's change in level of consciousness.

1. Think about a time when you worked with a patient who presented in a similar fashion to this scenario. What problem could this patient be experiencing?
    a. How do you know that this is delirium?
    b. How have you recognized delirium in your patients?

II. Caring for patients with delirium

Delirium- An acute confusional state with attention deficits, disorganized thinking, fluctuating behavior, altered mental status, and/or level of consciousness usually within a 24 hour span.

2. It has been reported that clinicians have different kinds of feelings or reactions about caring for patients experiencing delirium. How would you describe your experiences in caring for a patient experiencing delirium?
    a. Ideally, how should the communication to other clinicians that your patient may be experiencing delirium occur?
    b. What are some of the challenges in communication to other clinicians?
    c. What are the specific challenges that you face with patients experiencing delirium?

III. COVID-19

The COVID-19 pandemic has had a tremendous impact on patients and clinicians. I am interested in understanding how the COVID-19 pandemic impacted patients who may or may not be experiencing delirium.

3. Can you share your thoughts about how the COVID-19 pandemic might have affected patients experiencing delirium in your unit or care area?
    a. How do you feel the presence of the COVID-19 pandemic affected the rates of delirium among your patients?
    b. How has your ability to detect or assess for delirium changed?
    c. How has this changed the way you feel about caring for a patient who may have been experiencing delirium during the COVID-19 pandemic?

IV. Prevention and management of delirium

4. The prevention and management of delirium can be challenging. What are your thoughts on preventing and managing delirium in patients?
    a. What are some of the best ways to prevent and manage delirium?

b. What prevents you from effectively preventing or managing delirium in your patients?

c. How can you be supported in preventing and managing delirium?

5. What changes do you make to your care if a patient is experiencing delirium?

V. Summary

6. In general and with regards to the COVID-19 pandemic, is there anything else that you feel is important for us to know about patients experiencing delirium?

    a. How can you be supported in recognizing delirium in patients?