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Beyond the Physical Wounds: A Proactive Approach to Mental Health Recovery After a Traumatic Injury

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Abstract

Background: Every year, millions of Americans incur a life-threatening traumatic event and are admitted to trauma centers to treat their acute physical injuries. While traumatic injury is closely associated with developing post-traumatic stress disorder (PTSD), patients are rarely evaluated for PTSD risk or educated about long-term psychological sequelae.

Local Problem: The predictive value of early screening to quantify PTSD risk in trauma patients is well documented in the literature. However, in a 241-bed Level II Trauma acute care hospital, there was no protocol to evaluate the likelihood of PTSD development or provide mitigating intervention as indicated.

Methods: Staff knowledge, patient screening rates, and rates of mental health referrals were evaluated to determine the effectiveness of a PTSD risk screening and intervention protocol. A pre/post survey was used to measure staff knowledge acquisition. PTSD screening and mental health referral rates were assessed using structured observations and tracking trauma registry data.

Interventions: An evidence-based, de novo PTSD risk protocol with three key interventions: a two-hour evidence-based education module for trauma center staff; patient bedside screening using a PTSD risk predictor tool; and a guided, stepped-intervention approach based on risk categories.

Results: Staff knowledge mean scores increased from baseline by 28%. PTSD risk screenings were administered to 95% of eligible patients, and 94% of patients classified as high-risk for PTSD development received a referral for mental health services upon discharge.

Conclusions: A PTSD risk screening protocol provides a straightforward, cost-effective approach to identify PTSD-related morbidity.

Keywords: early intervention, PTSD, screening, trauma, traumatic center, trauma injury, trauma patient

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Introduction

Background

Every year, millions of Americans are admitted to a hospital trauma center following a traumatic injury. Events such as motor vehicle accidents, violent crimes, and falls cause many of these injuries (American College of Surgeons [ACS], 2022a) and contribute to trauma's designation as one of the leading causes of death and disability (Centers for Disease Control and Prevention [CDC], 2021).

Approximately 30% of patients who suffer a life-threatening injury experience post-traumatic stress disorder (PTSD) symptom within six months (National Center for PTSD, 2022a). The National Institute of Mental Health (2022) reported that individuals who have experienced a traumatic injury are more likely than the general population to die by suicide—indicative of the despair and psychiatric comorbidity associated with trauma. Reflecting a growing awareness of the need to manage mental health concerns after trauma, the ACS Committee on Trauma (2018) recommends that trauma centers design strategies to reduce psychological sequelae after injury. Given the complexity of the relationship between traumatic physical injury and mental health, the ACS has released new standards for 2023, requiring trauma centers to conduct mental health screening to target at-risk patients (ACS, 2022b).

Problem Description

A trauma center's primary concern is a patient's acute physical injuries while in the hospital. Treatment is focused on the traumatic event's impact on the physical body rather than cognitive or emotional reactions related to the injury and event. However, accumulated evidence

has shown that exposure to traumatic injury can result in acute stress and PTSD, lower quality of life, poor outcomes, and mental health difficulties long after the physical injuries have healed (Dai et al., 2018; Manser et al., 2018). Intrusive memories, nightmares, and ruminations associated with the injury can lead to cognitive and emotional abnormalities that impact rehabilitation and can lead to long-term health conditions (Visser et al., 2017). While being treated for traumatic injuries in the hospital, patients are rarely screened for or educated about the potential for developing PTSD as a long-term effect of their injury.

At the site of this quality improvement project, a Level II Trauma Center of an acute care hospital in Northern California, there was no mechanism in place to assess the likelihood of PTSD development or provide mitigating interventions as indicated. Like many other trauma centers, treatment focuses on acute physical injuries and does not address mental health sequelae with the patient prior to discharge. In the current state of focusing on the immediate injury, the mental health aspect of patient care is overlooked and can lead to poor health outcomes. This unrecognized vulnerability to psychological maladjustment following a physical injury can lead to severe and long-lasting mental health impairments.

Failure to screen for mental health issues after an injury may leave many individuals at risk of developing PTSD, without the care required for prevention. Providers can better support complete emotional and physical healing with more knowledge of patients' experiences (e.g., stressors, feelings, and thoughts) throughout the peri-trauma period following physical injury. Early screening to quantify the risk for PTSD is an important predictor of treatment success for trauma survivors (Nehra et al., 2019). A PTSD screening process can help identify the risk for PTSD development in patients after injury. It also directs the focus on early interventions that may help prevent the disorder in high-risk patients, aligning with the mission of the organization

to enhance the well-being of the communities it serves. The new ACS screening requirement for 2023 is an important step to reduce the PTSD burden and improve the patient's overall outcome.

Setting

This quality improvement initiative occurred at a 241-bed Level II Trauma acute care hospital in Northern California. The hospital provides advanced trauma care to patients with major, life-threatening injuries. It is designated as a trauma center by the Sacramento County Emergency Medical Services Agency and verified by the American College of Surgeons. The emergency room (ER) had approximately 126,000 visits in 2022. The trauma bay, situated within the ER, treated approximately 1,500 trauma patients in 2022. The more severely injured patients are admitted from the ER trauma bay to a designated trauma unit for inpatient care. Seven trauma surgeons and two advanced practice providers (APPs) care for trauma patients. In addition to the surgeons and APPs, the trauma team includes a dedicated Trauma Program Director (DNP student), a Trauma Clinical Nurse Specialist (CNS), a Trauma RN Patient Care Coordinator (PCC), and Trauma Social Workers.

Specific Aims

The purpose of this Doctor of Nursing Practice (DNP) evidence-based change project was that by June 2023, the trauma center would develop, implement, and evaluate a standardized PTSD risk assessment protocol, as required by the ACS, for admitted trauma patients. There were three specific aims:

1. By October 2022, participants in the educational intervention would gain at least 20% more knowledge of the PTSD screening strategy, as evidenced by pre- and post-assessment surveys.

2. By March 2023, at least 80% of traumatically injured patients would receive PTSD risk screening before discharge.
3. By June 2023, mental health referrals would be provided to at least 80% of patients in the high-risk category for PTSD development.

Available Knowledge

PICO(T) Question

The PICO(T) question used to guide a review of evidence in the literature is: In traumatically injured patients (P), how does screening for PTSD risk (I), compared to no screening (C), affect early intervention to mitigate or prevent PTSD development (O)?

Search Methodology

A comprehensive assessment of published literature served as the foundation to understand the prevalence and severity of PTSD and examine the evidence to support implementing a post-injury PTSD screening method to aid mental health recovery. Searches were performed on three databases: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and the Cochrane Database of Systematic Reviews. The keywords *early intervention, post-traumatic stress disorder, PTSD, screening*, *trauma, trauma center*, *trauma patient,* and *traumatic injury* were used with the Boolean operators AND and OR. Inclusion criteria consisted of English only and were published between 2015 and 2022. Studies on traumatic injuries sustained in combat were excluded. The search returned 19 pertinent articles, eight from CINAHL, nine from PubMed, and two from the Cochrane Database of Systematic Reviews. A subsequent search in CINAHL using advanced tactics to narrow the search in Clinical Queries to Qualitative-Best Balance and restrict Publication Type to Meta Synthesis returned two additional studies.

Abstracts, keywords, and content of all 21 articles were reviewed to determine relevance. Eleven studies were excluded as the content did not address the PICOT question or the studies were conducted solely on pediatric patients or not conducted in trauma centers. The remaining ten studies were appraised using the Johns Hopkins Nursing Evidence-Based Practice tool (Dang & Dearholt, 2018), shown in Appendix A. Four studies were rated Level I, two Level II, three Level III, and one Level V. Quality ranged from good (B) to high (A).

Integrated Review of the Literature

People who have survived a traumatic physical injury can experience various mental health problems related to the incident. The mental health burden subsequent to an injury can affect all aspects of life. The literature review examined the effect of screening versus no screening on early intervention to prevent or mitigate PTSD development. Three themes emerged from the review: a relationship between physical injury and mental health; early screening to quantify PTSD risk is a valuable predictor of maladaptive outcomes after injury; and early interventions reduce the prevalence of PTSD.

Relationship Between Physical Injury and Mental Health

Traumatic injuries are one of the most common causes of long-term functional disabilities (ACS, 2022a). Exposure to such experiences frequently results in the development of PTSD and a diminished quality of life, poor outcomes, and mental health problems long after the physical injuries have healed (Manser et al., 2018). A Level I Quality B study by Manser and colleagues (2018) explored the feasibility and effectiveness of screening for PTSD risk at a Level I trauma center. The results revealed that 26% of the trauma survivors had at least one symptom of PTSD prior to discharge, and 62% met PTSD criteria at 45 days post-injury. In a systematic review of 66 studies, Visser et al. (2017) explored the course, prediction, and treatment of PTSD

in trauma patients. In this Level III Quality A study, the authors found prevalence rates for PTSD in trauma survivors ranging from 17.5% to 42% at one to six months post-injury. The two studies highlighted that mental health and exposure to a traumatic injury are closely related.

Nehra et al. (2019) explored the link between a patient's self-reported resilience characteristics and functional and psychosocial outcomes in adult trauma patients after injury. In the Level II A study, 67% of patients fell into a low resilience group, and 35% of those individuals screened positive for PTSD. This low resilience, or lack of ability to recover, can lead to long-term adverse outcomes. In addition, being severely injured differs from other traumas due to its direct and significant impact on the body and inherent abilities, influencing resilience as a consequence (Kampman et al., 2015).

Dai and colleagues (2018) aimed to determine the pooled prevalence of acute stress disorder and PTSD among traffic accident survivors through evidence presented in a systematic meta-analysis (Level II Quality B). The pooled prevalence of acute stress disorder was identified in 15.81% of the participants, and 57-92% of those individuals developed PTSD within six months after injury. The findings supported the premise that road traffic accidents not only lead to serious physical injuries but also put survivors at an increased risk of a wide range of psychiatric disorders, particularly acute stress disorder and PTSD (Dai et al., 2018). In a recent qualitative study (Level III Quality B), Ravn and colleagues (2020) interviewed eight victims of vehicular crash injuries to investigate the potential relationship between PTSD and pain after a motor vehicle crash. The findings emphasized a theme that underscored the intricacy and extent of PTSD and pain comorbidities, highlighting how the psyche and body are closely intertwined. Several patients in the study indicated that the chronic pain associated with their injury had a

negative impact on their psyche and limited their ability to cope with the stress they were experiencing, with PTSD being the ultimate result (Ravn et al., 2020).

Other traumatic injuries put individuals at even higher risk of developing PTSD, such as traumatic brain injury (TBI) and injuries caused by violent acts. This is directly related to persistent rumination and the patient's "almost died" feelings after these events (Stein et al., 2019; Visser et al., 2017). The systematic review of Visser et al. (2017) found rumination to be one of the strongest predictors of PTSD. Development of PTSD is common after a patient experiences a TBI, likely due to the close relationship between anxiety, depression, and sleeping disorders in both diagnoses. A recent Level II Quality B prospective longitudinal cohort study by Stein et al. (2019) examined the PTSD prevalence in patients who sustained a mild TBI compared to those with orthopedic injuries. At three months, patients who suffered a TBI injury had a weighted prevalence of PTSD at 20%, compared to those with orthopedic injuries at 8.7%. Accumulated evidence from research shows not only an increased risk for the development of PTSD after injury from a violent act but that the onset of PTSD development is earlier when the traumatic injury is from an intentional act of violence (Hunt et al., 2017; Shalev et al., 2019; Stein et al., 2019). These studies demonstrated that the type of traumatic injury can impair an individual's mental health, but the mechanism by which it occurred also plays a role.

Early Screening is a Valuable Predictor

Early screening to quantify the risk for PTSD is a valuable predictor for trauma survivors (Dai et al., 2018; Hunt et al., 2017; Nehra et al., 2019; Ravn et al., 2020; Shalev et al., 2019; Visser et al., 2017). People are inherently different, and there is no “litmus test” for determining whether a given trauma survivor will or will not develop PTSD. However, the studies consistently showed that screening could help identify those most at risk.

A recent Level I Quality A meta-analysis by Shalev et al. (2019) aimed to determine the probability that someone would meet the PTSD diagnostic criteria after admission for a traumatic injury. The predictors used were early symptom severity scores from the Clinician-Administered PTSD Scale for DSM-IV (CAPS), and a set of observable risk indicators. In contrast, the risk indicators were gender, trauma type, and lifetime trauma history. Endpoint PTSD prevalence was found to be 11.8%. Accurate risk estimates ($r = 0.976$) were produced using early symptom severity as a predictor of follow-up PTSD. Interestingly, the study reported that females with less than a secondary education and exposure to prior interpersonal trauma had a 34% higher risk compared to participants without those risk factors. Shalev's findings of the association between high initial PTSD symptoms and a PTSD diagnosis demonstrated the informative utility of predictive screening. Quantifying the patient's PTSD risk following a traumatic injury admission can provide an empirical foundation for mitigating and preventing a major health issue (Shalev et al., 2019; Visser et al., 2017). In addition, recognizing the risk of developing PTSD informs clinical action and allows early intervention measures to be initiated, thereby decreasing the burden of PTSD on the injured (Dai et al., 2018; deRoon-Cassini et al., 2019).

Dai et al. (2018) estimated from their research that failure to screen trauma survivors for mental health difficulties after injury deprives up to 90% of people with post-injury PTSD or depression of adequate care. Multiple studies have assessed the feasibility of administering currently available PTSD screening tools and their usefulness in predicting the disease (deRoon-Cassini et al., 2019; Hunt et al., 2017; Manser et al., 2018; Shalev et al., 2019). Each of the screening tools used in these studies showed promise in predicting the development of PTSD. The consistent message was that developing and using a PTSD screening tool process is

necessary to survey the existing risk factors for PTSD (deRoon-Cassini et al., 2019; Manser et al., 2018; Nehra et al., 2019).

Hunt et al. (2017) performed a Level III Quality B prognostic study to compare the Injured Trauma Survivor Screen (ITSS) to other validated PTSD screening tools for trauma patients treated in a hospital setting. With a sensitivity of 75.00 and a specificity of 93.94, the study demonstrated that the brief ITSS tool can predict PTSD risk in hospitalized trauma survivors. Early screening for post-traumatic psychological distress, such as that provided by the ITSS, has important implications for clinical practice. A review of evidence on PTSD screening methods and treatment for hospitalized trauma survivors was performed by deRoon-Cassini et al. (2019). Based on their Level V Quality B review, the authors found the ITSS tool to be the most valuable screening tool for predicting risk. A positive screen could alert treatment providers to the need for consultation from a mental health provider to manage the patient's care and increase the likelihood of better overall post-traumatic health outcomes (deRoon-Cassini et al., 2019; Hunt et al., 2017). In a study that used the PTSD Checklist DSM-5 for screening, Stein et al. (2019) identified positive PTSD in 20% of TBI patients, underscoring the importance of screening to identify at-risk individuals and inform efforts for surveillance and intervention.

A significant strength of the systematic review by Visser et al. (2017) on the course, prediction, and treatment of PTSD in trauma patients was that it examined the development of PTSD by analyzing which predictors may influence the progression of the disease. Visser and colleagues (2017) found predictors such as low resilience, poor coping skills, and a lack of support systems to be particularly useful in identifying at-risk patients. Screening for these predictors enables a nurse to immediately begin psychological first aid, even before referrals for additional treatment are made.

Nehra et al. (2019) explained resilience as the ability to effectively cope, both mentally and emotionally to recover from a significant crisis that poses threat to the life or functional well-being of a trauma survivor. In the authors' view, it is imperative that members of the trauma community focus on a better understanding of recovery trajectories and understand that resilience is a significant predictor of long-term outcomes (Nehra et al., 2019). By synthesizing existing qualitative studies, Kampman and colleagues (2015) provided a deeper understanding of severe injury and post-traumatic growth in trauma survivors. Kampman et al. (2015) determined that patients with low resilience consistently exhibited the least post-traumatic growth after a traumatic injury. From the Level III-A findings, the authors concluded that screening could help identify individuals with subthreshold trauma symptoms and use them to foster resilience in the wake of trauma. Early screening is particularly critical because PTSD may be prevented by early treatments that begin almost immediately after or within the first two weeks after trauma (Nehra et al., 2019; Visser et al., 2017).

Early PTSD Interventions

Early interventions have been shown to reduce the prevalence of PTSD, and targeting high-risk patients decreases the overall PTSD burden to the system (Dai et al., 2018; deRoon-Cassini et al., 2019; Hunt et al., 2017; Manser et al., 2018; Nehra et al., 2019; Shalev et al., 2019; Visser et al., 2017). Depending on the risk level, interventions can include education, trauma-informed care, coping methods, cognitive process therapy, medicines, or a combination of therapies. Early intervention models are intended to reduce the negative consequences of a traumatic event.

Kampman et al. (2015) reported that patients with severe injuries might benefit from interventions that emphasize recognizing and accepting the negative aspects of the injury.

Furthermore, patients who received education on coping skills, such as positive cognitive rumination techniques, reported having a better ability to control their anxiety level and gain inner strength (Kampman et al., 2015). According to the review of evidence by deRoon-Cassini and colleagues (2019), integrating psychological therapies, such as psychoeducation, into routine medical care was useful in destigmatizing and normalizing mental healthcare following injury.

Furthermore, deRoon-Cassini et al. (2019) and Hunt et al. (2017) showed that using a stepped intervention approach was the most valuable because it is determined by symptom progression and provides the least intrusive method for treating PTSD. According to the research by Shalev et al. (2019), "early cognitive-behavioral interventions significantly reduce the prevalence of PTSD. However, they are resource-demanding and should be targeted at the highest at-risk individuals" (p.77). Studies on early PTSD interventions have consistently found that patients recover faster and have better long-term outcomes when providers support complete emotional and physical healing throughout the peri-trauma period following injury. deRoon-Cassini et al. (2019) found that interventions occurring within the first four weeks of injury yielded the most significant effects on decreasing subsequent PTSD development. Furthermore, untreated PTSD is a considerable risk factor for deficits in other domains, including physical recovery, social functioning, and quality of life (Manser et al., 2018).

Summary/Synthesis of the Evidence

The literature consistently showed the risk associated with patients experiencing a traumatic injury and subsequently developing PTSD. The research suggested that trauma centers should screen and provide brief interventions for PTSD risk to injured trauma survivors. In this way, by evaluating post-injury mental health and identifying individuals at the greatest risk, the trauma provider can reduce a major health concern and improve patient outcomes. Although

PTSD screening is not a new concept, screening for the risk directly after an injury is a relatively novel idea. The evidence made clear that the structure of the setting and the resources available in that setting were integral to the choice of a screening tool and suggested as primary considerations how long screening will take and the mental health resources available to provide interventions.

The studies reviewed did not offer a consensus on the best treatment interventions to address the risk of PTSD following injury. However, a stepped intervention approach was cited as a best practice, mainly due to its problem-solving components around each patient's unique constellation of post-injury concerns and behavioral activation elements. This approach to intervention will support providing the best trauma-informed care with the least intrusive methods based on an individual's symptoms. Given the lack of consistency on the most effective PTSD risk treatment interventions and the paucity of studies evaluating them, additional research is needed. Despite the lack of evaluative studies on PTSD risk intervention, the literature reviewed consistently identified early intervention as a critical step in preventing the onset of PTSD after injury.

The results from the literature shed light on the importance of screening for PTSD risk after a traumatic injury has occurred. Findings revealed that the significant and widespread mental health burden following injury is far-reaching and can lead to poor long-term outcomes. The level of evidence was of sufficient strength to propose a change in clinical practice (Dai et al., 2018; Hunt et al., 2017; Kampman et al., 2015; Manser et al., 2018; Nehra et al., 2019; Ravn et al., 2020; Shalev et al., 2019; Stein et al., 2019; Visser et al., 2017). These studies suggest trauma centers can provide a significant opportunity to improve health outcomes and provide trauma-informed care for trauma survivors through early screening and intervention measures.

Rationale

The theoretical framework selected for this project of improving mental health after a traumatic injury is Hildegard Peplau's Interpersonal Relations Theory (Peplau, 1952). Central to the Interpersonal Relations Theory is the view that nursing's purpose is to assist patients in identifying their perceived difficulties (Peplau, 1997). The nurse's ability to lessen a patient's fear and encourage the patient to confide in all presenting symptoms, even if not physical, depends on the nurse developing a trusting connection with the patient (Peplau, 1997). Peplau's theory focuses on the nurse-patient relationship and the five roles of caring for patients: stranger, educator, resource person, counselor, and advocate. The Interpersonal Relations Theory concentrates on patient experiences, highlighting Peplau's belief that patient care entails both interpersonal and psychological phenomena in addition to medical care (Peplau, 1952, 1997). While this theory applies to all areas of nursing, it is particularly applicable in psychiatric care due to the increased need for trust, communication, and the ability to relate to others (Peplau, 1997).

A PTSD risk screening strategy considers the nature, interpretation, and complexities of care for the mind, body, and spirit for mental health following a traumatic injury and is supported by Peplau's theory. Suffering a traumatic injury can leave a patient unable to cope effectively with life's stressors, resulting in PTSD. A therapeutic relationship will foster trust and encourage patients to share their feelings when answering the PTSD risk assessment questions, enabling the clinician to identify the necessary interventions. This journey of an interpersonal and therapeutic relationship between a trauma care provider and the patient is intended to lead the patient toward mental health recovery.

The APPs and social workers on the trauma team play the sequential roles of a stranger, educator, resource person, counselor, and advocate during the PTSD screening and intervention

process of the proposed project. As a trauma patient is admitted, the clinician can overcome the stranger phase by fostering a trusting environment. As an educator, the patient is informed of the potential physical and mental health consequences of the injury. In this manner, the provider develops into a resource which encourages and provides support when needed. As the clinician assists the patient in understanding the significance of the current circumstance, they give direction and encouragement to facilitate change. Finally, acting as an advocate for the patient, the clinician helps the patient move through the domains of interdependence to independence. Using Peplau's approach will improve the PTSD risk screening process by steering the provider-patient relationship to promote holistic care for the patient's mind, body, and spirit.

Methods

Context

The setting for this evidence-based project was a 241-bed Level II Trauma acute care hospital that is part of a non-profit integrated healthcare system in Northern California. The medical center’s catchment area has a population of 80,010, with more than 50% between the ages of 25 and 54 (Be Healthy Sacramento, 2022). The catchment area also scores high for individuals with poor mental health, with a Mental Health Index of 75.9 (Be Healthy Sacramento, 2022). The hospital is located between two major highways in Sacramento that run through California. Sacramento County estimates 59 residents per 10,000 are experiencing homelessness at any given time (Be Healthy Sacramento, 2022).

The emergency room (ER) is one of the busiest in California and had approximately 126,000 emergency room visits in 2022 (Dr. A. Elms, personal communication, August 18, 2023). The trauma center within the ER treats roughly 1,500 trauma patients annually, with falls, acts of violence, and motor vehicle crashes being the three most common causes of injury (Dr. J.

London, personal communication, August 31, 2022). Approximately 650 of the most severely injured patients are admitted annually to a designated trauma unit within the hospital for inpatient care. Seven trauma surgeons and four APPs provide medical care for all trauma patients. The trauma team also includes a dedicated Trauma Program Director, a Trauma CNS, a Trauma RN PCC, and Trauma Social Workers.

A multidisciplinary approach was required for the successful implementation of the project. Stakeholder involvement at all stages of implementing this PTSD risk strategy project encouraged early buy-in, enhanced program design, and facilitated long-term support. A stakeholder analysis using a power versus interest grid revealed the power dynamics of the stakeholders for the project (see Appendix B). Although many stakeholders were involved, the high-power high-interest group did most of the planning and implementation work. This multidisciplinary team of leaders in trauma collaborated and communicated with other less-involved stakeholders to successfully implement the project.

This project's high-power high-interest stakeholders were the trauma physicians, mental health providers, Trauma Program Director, APPs, trauma CNS, social work manager, and nurse managers. These individuals have considerable decision-making authority, so their active involvement and close collaboration was critical. These stakeholders were invited to strategy and road mapping meetings to leverage their knowledge and perspective, and secure project buy-in. Additionally, continuously involving these individuals in policy development, oversight of policy implementation, and meeting educational needs helped sustain the project plan. Lastly, these high-power high-interest stakeholders positively influenced others to engage with and support the project.

Interventions

The purpose of this DNP evidence-based change initiative was to establish a PTSD risk screening protocol within the current Level II trauma center by June 2023. A growing body of literature suggests that trauma centers with early screening programs that address psychological sequelae reduce symptoms' severity and improve individuals' overall functioning and quality of life (Nehra et al., 2019; Shalev et al., 2019; Visser et al., 2017). Adopting a screening and intervention process for PTSD risk sets an empirical basis for preventing or mitigating a significant health concern and aligns with the organization's overarching mission to enhance the well-being of the communities it serves. Furthermore, the gap analysis revealed non-compliance with the upcoming ACS standards for mental health screening post-injury. The initiation of this protocol is intended to facilitate the organization's alignment with these regulatory standards.

An evidence-based, de novo PTSD protocol was developed over 18 months to align with the recently established regulatory standards set forth by the ACS. Prior to project implementation, stakeholders participated in the development and review of several tools to ensure success, including a risk predictor screening tool, an intervention algorithm, and an education module. Project execution comprised three core interventions: presentation of a two-hour evidence-based educational module during staff training, a bedside screening tool to assess PTSD risk among trauma survivors, and implementation of a stepped-intervention approach, which included mental health referrals for individuals identified as high risk.

PTSD Protocol

Risk Predictor Screening Tool. The standards set forth by the ACS Committee on Trauma require trauma centers to screen trauma survivors after injury for the risk of PTSD (ACS, 2022b). However, ACS grants trauma centers discretion to select the screening instrument that best aligns with their specific operational context and requirements. Therefore, selecting a

risk predictor screening tool for PTSD involved considering various factors at the current organization, including the tool's validity, reliability, and ease of use at the bedside.

Several validated screening instruments from the National Center for PTSD (2022b) were examined for ease of use: the PCL-5 (PTSD Checklist for DSM-5), PC-PTSD-5 (Primary Care PTSD Screen for SDM-5), and the CAPS-5 (Clinician-Administered PTSD Scale for DSM-5). As these screens were not designed for use in an acute care setting, the ITSS (Injured Trauma Survivor Screen) screening tool was also reviewed (deRoon-Cassini et al., 2019; Hunt et al., 2017). Local stakeholder leaders from trauma, mental health, and social work conducted a comprehensive assessment to evaluate the efficiency and effectiveness of each tool when used at the bedside. Following this evaluation, the nine-item ITSS tool was selected for the risk screening protocol. Permission to use the ITSS screening tool for the project was requested from the tool's author and granted (see Appendix C).

The ITSS screening tool comprises nine items, four assessing for PTSD and four for depression, with one item overlapping in both assessments (see Appendix D). This tool is characterized by its conciseness, as it employs a binary response format (yes or no) and can easily be used at the bedside. Each question is scored as a 1 for "yes" and 0 for "no," with a total score of 2 or more indicating a positive risk assessment. The trauma social worker will administer the risk assessment tool and document the score in the electronic medical record within the mental health assessment section, categorized as low (≤ 2), moderate (3-4), or high (5) risk based on the score.

Intervention Algorithm. An intervention algorithm provides a consistent stepped-care approach to managing patients at risk of PTSD development after injury. Adoption of an algorithm by healthcare providers ensures uniform adherence to established guidelines,

diminishing care variability, and improving the overall quality of interventions. A stepped intervention algorithm for this project was developed in collaboration with the Trauma Medical Director, trauma CNS, and the trauma APPs (see Appendix E).

The algorithm was designed to ensure that the intensity of interventions aligns with the level of distress a patient is experiencing, enabling provision of individualized care. Using this algorithm to guide a stepped intervention strategy based on the patient's risk level following screening demonstrates a comprehensive and patient-centered approach. Following the initial screening, social workers offer educational guidance to all patients regarding coping strategies and post-injury mental health recovery goals as a first-line intervention for all trauma patients. During the discharge process, the APPs refer to the PTSD score and risk level to determine if further interventions are required. Patients who are identified with moderate PTSD risk scores are placed on the clinic schedule to undergo a subsequent telephone PTSD screening 30-45 days post-injury, facilitated by the trauma RN PCC. In contrast, high-risk patients receive a prompt referral for a comprehensive psychiatric outpatient assessment by a qualified mental health provider upon discharge.

Education Module. A two-hour evidence-based education module that covered PTSD risk factors, coping mechanisms, and the new screening process was developed to train staff to implement the PTSD risk screening and intervention protocol (see Appendix F). The participating staff were social workers, APPs, and the trauma RN PCC. The education focused on using trauma-informed care to build trust, avoid re-traumatization, and reduce the stigma of mental health concerns for trauma survivors. Trauma-informed care recognizes the widespread impact of trauma on individuals and seeks to create an environment sensitive to their needs and experiences. This training in trauma-informed care underscored the importance of a nurturing

and knowledgeable healthcare environment that emphasized the psychological well-being of patients together with their physical health.

The DNP student, the organization's Trauma Program Director, developed and conducted the training in conjunction with the trauma CNS. The education module was created as a PowerPoint presentation to deliver the in-person training. Each participating staff member was given a copy of the PowerPoint slides to use as a framework for taking notes during the presentation, helping them retain and recall the information at a later date. A screening script was created and rehearsed during the training to enhance ease of engaging in conversations about sensitive topics.

As precursors to developing and implementing the PTSD risk protocol, gap and SWOT analyses were completed to assess the current state and develop strategies aligned with project goals and external factors. A GANTT chart, work breakdown structure, and responsibility/communication matrix were performed to guide project implementation, and a financial analysis was conducted to ascertain the project's financial value to the sponsoring organization.

Gap Analysis

To formulate and execute the PTSD risk protocol, a gap analysis was employed to evaluate the project's existing status and devise strategies per project objectives (see Appendix G). This gap analysis offered a structured method to guide the change of the practice in the PTSD risk strategy for admitted trauma survivors. The absence of PTSD screening was the most consequential gap between the current and desired states uncovered at the trauma center. The lack of in-hospital screening leaves trauma survivors discharged without instructions on seeking post-injury psychological support or the necessary coping skills for managing potential negative

emotions. Furthermore, the gap analysis underscored a lack of comprehension by staff of PTSD risk factors for trauma survivors.

Gantt Chart

A timeline of work highlighting the key points of the project is displayed in a Gantt chart (see Appendix H). The planning phase consisted of establishing the project aim, formulating a project plan and budget, and obtaining approval from the project's stakeholders. In this phase, (a) a validated PTSD risk predictor screening tool was selected; (b) a screening flow map was created; (c) an intervention algorithm was developed; and (d) education materials with learning assessment were created. The execution stage included the project kickoff, staff education with pre- and post-knowledge assessments, and taking the project "live." Finally, in the measurement stage, the screening tool was monitored, data was collected and analyzed, a final project report was developed, and a visual dashboard of the project's results was shared with stakeholders at the quarterly Trauma Operational Committee meeting.

Work Breakdown Structure

A Work Breakdown Structure (WBS) was developed to ensure the project was organized for timely completion of its full scope (see Appendix I). In the planning phase, a collaborative team of frontline "boots on the ground" members were assembled to formulate the project plan. This included a comprehensive review of various validated PTSD risk screening tools to select the most suitable one for the organization. The workflow for PTSD screening was delineated, and an intervention algorithm was devised. During the execution phase, the team created a screening tool script for staff to follow. Staff members received education, accompanied by pre- and post-assessments to gauge knowledge acquisition. In the evaluation phase, the WBS encompassed measurement and feedback components, illustrating how monitoring and statistical analysis were communicated to the teams. This was achieved through a visual dashboard

designed for each unit, highlighting project achievements and areas with opportunities for improvement.

Responsibility and Communication Plan

The responsibility and communication plan displays meetings and other communication for planning, implementing, and evaluating the PTSD risk screening protocol (see Appendix J). Meetings included the initial executive stakeholder meeting to present the project concept, gain support, and obtain feedback. The bulk of the project work was accomplished during multidisciplinary meetings, and included project planning, development, and launch preparation. Team leaders from each department participating in the project attended the meetings, relaying information to their respective departments as appropriate. The participants collaborated on and completed assigned tasks such as developing the screening and intervention algorithms, creating educational materials, and analyzing project metrics. Education sessions were held with staff involved in the screening and intervention process. A project review meeting was held with the multidisciplinary team to analyze the project's effectiveness and share lessons learned.

SWOT Analysis

A SWOT (strengths, weakness, opportunities, threats) analysis was conducted to help determine the project’s viability and inform its direction (see Appendix K).

Strengths. Several strengths of the sponsoring organization support using a PTSD risk screening strategy for injured patients as standard practice. The organization is a Level II trauma center governed and verified by the ACS. The ACS Committee on Trauma is dedicated to providing verified trauma centers education and training, supporting research, and advocating for policies and resources that enhance trauma care. An additional strength is the presence of a dedicated interdisciplinary team, consisting of a CNS, APPs, nurses, and social workers who are

collectively responsible for delivering comprehensive care to trauma patients. This collective commitment nurtures a culture of consciousness regarding PTSD prevention and facilitates the implementation of proactive bedside interventions for individuals identified as at high risk prior to their discharge.

Weaknesses. One of the organizational weaknesses is the substantial complex patient caseload the trauma team manages. The trauma center's patient population includes a high proportion of patients presenting with poor mental health, substance use disorder, and homelessness. Mitigating these social determinants of health demands a considerable investment of time, effort, and resources from the team. Additionally, persistent staffing concerns and the lingering effects of COVID-19-related burnout may contribute to staff hesitating to assume additional responsibilities or adapt to a new protocol. Moreover, frequent pandemic-related initiatives imposed over the past three years have surfaced indications of change fatigue. The organization's level of physician engagement in making PTSD referrals also represents a weakness. Since a PTSD diagnosis cannot be made until 30 to 45 days after injury, some physicians are of the opinion that PTSD is best assessed after discharge. Finally, a weakness stems from recent organizational leadership changes, including the appointment of a new Vice President and Chief Operating Officer. The introduction of new executive leadership, while valuable in various respects, is accompanied by a lack of institutional knowledge, potentially impeding the robust support needed to achieve excellence in trauma care delivery.

Opportunities. The ACS Committee on Trauma issued updated standards for 2023, requiring mental health screening to target at-risk patients (ACS, 2022b). This development underscores a heightened recognition of the imperative to address mental health issues following trauma and aligns with the objectives of this project. An additional opportunity lies in the

availability of psychiatry residents being placed within the hospital, who can provide essential support to at-risk patients, thus enhancing the accessibility of mental health services for patients in need.

Threats. A substantial threat to this project is the lack of sufficient mental health resources within the local community, exacerbated by the COVID-19 pandemic. Patients continue to face substantial difficulties accessing these resources, irrespective of their insurance status. Given that a considerable proportion of the center's trauma patients have inadequate or no health insurance coverage, the task of locating post-discharge resources for them is arduous. The threat of being unable to secure essential follow-up PTSD care for patients poses a risk to sustaining the referral component of the program.

Comprehensive Financial Analysis

Budget. A three-year proforma financial budget was developed to delineate the expenses associated with implementing a PTSD screening protocol, in conjunction with a cost-benefit analysis to demonstrate the program's value (see Appendix L). The expenses for developing and implementing a PTSD risk screening protocol were low, with a budget of $5,710 in the implementation year. Costs included initial education and training for each staff participant based on their hourly wage and benefits totaling $1,522.00 (three APPs @ $113/hr for 2hr = $680, nine social workers @ $41/hr for 2hr = $774, two trauma registrars @ $34/hr for 1hr = $68). Additionally, the materials and supplies needed for the education packet and PTSD toolkit cost $228 (education materials $120 and supplies $108). The greatest single cost associated with this project was for the DNP student's time on project coordination and implementation ($3,960).

The annual cost to sustain the program is low since the screening process will be incorporated into the salaried employee workflow. Following the initial implementation year, projected yearly expenses to sustain the program are costs related to new hire orientation and annual education and training for all personnel, and amount to $723 in Year 2 and $738 in Year 3. The hourly wage was adjusted for each year to include a 1.5% pay increase. The education component will be incorporated into the existing annual trauma competency in Years 2 and 3, again keeping sustainment costs low.

Cost-Benefit Analysis. Total project expenses versus improved outcomes, such as decreased trauma readmission rates, are used to demonstrate financial benefit. Unanticipated hospital readmissions increase healthcare costs and patient mortality. Using CMS data from 2018 on hospital readmissions, Lunardi et al. (2019) found that one in four patients is readmitted within six months after hospitalization for trauma. Hospitals and government agencies utilize readmissions as a quality metric, and high readmission rates can carry significant financial consequences for a hospital. Using the 2018 Nationwide Readmission Database, Weiss et al. (2021) compared conditions with high frequency and cost of readmissions by expected payer and found that each readmission costs, on average, approximately $15,200. Likewise, hospital readmissions at the current hospital also average $15,200 but can reach much higher when complications and adverse events are associated with a patient's stay (E. Lovell, Financial Controller, personal communication, July 25, 2023). Furthermore, trauma readmissions at the current medical center are at an all-time high of 4%.

The cost-benefit analysis indicated that implementing a PTSD screening protocol would yield a cost-benefit ratio of 21% by Year 2 in the projection (see Appendix L.). The potential number of decreased readmissions to the trauma center is hard to predict. If a PTSD risk

screening protocol prevents only one trauma readmission in the implementation year, the net savings would be approximately $9,490 (readmission cost minus expenses), with a cost-benefit ratio of 2.7. The cost of two subsequent years' readmissions was calculated using the average annual inflation rate of 1.5% that is estimated by the U.S. Department of Labor (2023). The net cost-benefit savings in the subsequent years are higher at $14,705 in Year 2 with a cost-benefit ratio of 21.3 and $14,921 in Year 3 with a cost-benefit ratio of 21.2.

Study of the Interventions

Several factors contributed to the choice of implementing a comprehensive PTSD risk screening protocol for the project intervention. The predictive value of early screening to quantify PTSD risk in trauma patients is well documented in the literature. A growing body of literature suggests that trauma centers with early screening programs that address psychological sequelae reduce symptoms' severity and improve individuals' overall functioning and quality of life (Nehra et al., 2019; Shalev et al., 2019; Visser et al., 2017). Identifying symptoms early enables timely intervention and assistance, potentially reducing or alleviating the intensity of PTSD symptoms. Trauma center staff can deliver psychological first aid at the bedside using a screening and intervention protocol to help patients develop healthier coping mechanisms and improve their mental health.

The ACS Committee on Trauma introduced updated standards for 2023 in response to greater recognition of the importance of addressing mental health issues following trauma. These standards mandate trauma centers to implement mental health screening with the aim of recognizing patients at risk for PTSD development (ACS, 2022b). The gap analysis for the project identified the absence of a mental health screening process. Thus, by implementing a

PTSD risk screening and intervention protocol, the trauma center can ensure ACS standards are being met.

Educating providers who screen trauma patients was a crucial element of the intervention protocol. Context-specific education ensured that individuals conducting the screening had a clear understanding of mental health recovery after injury. This understanding is essential to identify individuals at risk for PTSD and provide them with the appropriate resources. In addition, informed staff can be expected to approach the screening process with sensitivity and empathy, reducing the stigma associated with mental health conditions like PTSD. This encourages patients to openly discuss their symptoms and seek help without fear of being judged. An informed and knowledgeable approach fosters trust between the patients and the screeners. Patients are more likely to engage openly when they feel that the screener understands their condition and can provide appropriate guidance.

In order to determine the impact of the interventions, several evaluative measures were employed. For the education component, a survey to assess the effectiveness of staff education was administered prior to and immediately after the session. Comparison between pre- and post-assessment scores provided a clear measure of knowledge acquisition. The impact of using the PTSD screening tool was established through a combination of formal observations and tracking and trending techniques. The PTSD screening tool scores and interventions employed were evaluated for accuracy on an ongoing basis and retrospectively. Feedback provided to the staff in real time improved the accuracy of their screening and intervention algorithm practices.

Outcome Measures

The pillars of this project were the creation and implementation of a PTSD risk screening protocol to identify at-risk patients and provide a stepped intervention approach to prevent the

development of PTSD. Project success was contingent on providers understanding the PTSD risk strategy and adopting the screening protocol. The outcome measures reflect the three specific aims of the project: a 20% gain in knowledge of PTSD risk screening by participating staff; an 80% PTSD risk screening rate for trauma patients; and an 80% mental health referral rate for patients determined to be at high risk for PTSD development.

Staff Knowledge –The rationale for using education as a context-specific strategy was to increase staff buy-in for the project and enhance the value and efficacy of the ITSS screening tool. An educational session covered the PTSD screening protocol, risk factors, and coping mechanisms associated with psychological sequelae following traumatic injury. A de novo, 12-item survey aligned with the educational content was used to assess knowledge acquisition (see Appendix M). The survey was developed through the combined efforts of content experts and the DNP student. Internal validity was established by administering the survey to three instructional design experts who evaluated the content and provided consistent answers. The survey contained three demographic questions and 12 multiple-choice content questions. Baseline knowledge was established by administering the survey immediately prior to the education session; knowledge acquisition was determined by comparing baseline scores to scores from the same survey administered immediately after the education session. Results are expressed as numerical and percentage improvements in mean scores. The objective was to attain a 20% enhancement in mean scores, a deliberate selection due to its specificity, feasibility, and congruence with the overarching goal of augmenting the trauma center's screening methodologies.

PTSD Risk Screening – The rationale for PTSD risk screening as an outcome measure was to gain insight into the progress, performance, and effectiveness of the new PTSD risk screening

protocol. Tracking PTSD risk screening before discharge was essential to measure adoption and compliance, identify drift, and uncover any unanticipated obstacles. Data was entered into and extracted from the organization's licensed trauma registry (Trauma One) and expressed as a Performance Improvement Indicator data point (high, moderate, or low risk). The specific aim was to screen at least 80% of traumatically injured patients before discharge. A single process measure was in place that involved a daily census review to confirm that the social worker had conducted screenings for all patients, helping to prevent patients from being overlooked.

Mental Health Referrals – The rationale for mental health referrals of high-risk patients as an outcome was similar to PTSD risk screening in that the data provided a window into the performance and effectiveness of implementing the new protocol. The data was essential to measure adoption and compliance. However, the specific target for this outcome measure was patients at high-risk of developing PTSD as indicated by audit filter data points. Referral compliance data was tracked through the trauma registry and expressed as an audit filter data point (yes or no). The specific aim for mental health referrals was to ensure that 80% of high-risk patients received referrals upon their discharge. The established process measure involved a daily census review to ensure that referrals for high-risk patients were initiated by the APPs upon discharge, preventing patients from being inadvertently left out.

Data Collection Instruments and Analysis

The educational survey was administered through Qualtrics with identification codes to ensure participant anonymity and enable pairing of pre/post scores for the individual participants. The data obtained through the Qualtrics platform was imported into an Excel spreadsheet to calculate the mean scores for each question, and the overall mean scores for both the pre/post surveys. The mean results from the pre- and post-surveys were then compared. Each question

was reviewed for trends in the data, such as questions that staff struggled with on the pre-test but improved on the post-test or persistent gaps in knowledge that staff had before and after the module. This information can be valuable for refining future instruction in the protocol. Additionally, Microsoft Excel was used for comprehensive data management and the creation of graphical representations of the collected data.

Trauma One data registry was utilized to monitor the patient risk screening scores using a PTSD Performance Improvement Indicator data point. The data points represented the risk levels: low, moderate, or high, and a category denoting cases where screening was not completed. These data points served as critical indicators when assessing screening compliance rates to the new protocol. Mental health referrals were tracked as an Audit Filter data point indicating yes or no for each high-risk patient to determine the referral adherence rate. The Trauma One registry was also used to provide analysis tables of aggregate data on screening and referral outcomes. Trauma One complies with the Health Insurance Portability and Accountability Act (HIPAA) and ensures that the confidentiality of all patient data is maintained.

Ethical Considerations

Organizational support was obtained (see Appendix N). The DNP student's chair and committee member of the University of San Francisco School of Nursing and Health Professions reviewed and approved the project and determined it met the guidelines for an evidence-based change of practice project (see Appendix O). IRB (Institutional Review Board) review was not required as the project was determined to be quality improvement and not research. Staff participation in the educational intervention and PTSD risk protocol is required to comply with the 2023 ACS requirements for mental health screening after injury. The trauma center's data

registry is an electronic health record for trauma patients that complies with the HIPAA requirements, ensuring that confidentiality of patient data will be maintained.

The project was carried out in a fashion that upholds the American Nurses Association (ANA) Code of Ethics (2015), with emphasis on provisions 2 and 3 as well as the principles of beneficence and non-maleficence. The selected provisions emphasize the significance of partnering with other healthcare professionals to provide high-quality patient care and advocate for patients' rights and safety. The ANA characterizes beneficence as the desire to do good, assist others, and advocate for the patient, while non-maleficence is the avoidance of causing harm (ANA, 2015). The main goal of implementing a standardized PTSD risk screening process was to improve outcomes for the trauma patient, demonstrating beneficence and non-maleficence. Injured patients can be empowered to take measures to prevent PTSD from developing if they are educated in how to manage the unpleasant emotions that follow a traumatic injury. Furthermore, healthcare providers who administer PTSD risk screenings and interventions to a vulnerable population have the added responsibility to ensure care is provided in a sensitive, meaningful way where benefits outweigh the harm, acting with beneficence and non-maleficence. This project promotes psychological safety by using trauma-informed care to create a safe, trusting, and supportive environment for patients who have experienced traumatic injuries.

The PTSD risk screening protocol for improving mental health after traumatic injury is consistent with the Jesuit values of *cura personalis* and *community in diversity* held by the University of San Francisco. These values are a foundation for compassionate career practice, community services, and personal growth. *Cura personalis* means "care for the entire person" in Latin (University of San Francisco [USF], 2022) and derives from the concept of care nurturing

the strength of an individual to face life's challenges and grow into a better person. Healthcare providers have the potential to shape the way individuals learn and heal mentally, physically, and emotionally. The value of *cura personalis* relates to the current project in that it underscores an attitude of respect for the dignity of all human beings and an understanding that each person has a different background that influences who they are today (USF, 2022). This is extremely important in trauma, as lifestyle choices frequently place patients in dire situations.

Understanding that lifestyle choices do not define patients and that all patients deserve respect and dignity is essential for a healthcare professional to establish a meaningful connection. The *cura personalis* value is essential in self-care as healthcare workers frequently put their physical and spiritual well-being on the back burner to care for others. Caregivers cannot become better people for the world without nourishing themselves physically, emotionally, and spiritually.

Another Jesuit value that aligns with the project is a *community in diversity*. This value provides a sense of belonging for persons from socioeconomically, racially, and sexually oppressed backgrounds (USF, 2022). In the field of trauma, community outreach and prevention must seek to engage with people of all cultures and value systems to be effective. As leaders, we must find ways to ensure that all backgrounds, beliefs, ethnicities, and perspectives are adequately represented. The greater an organization's ability to mirror its community and exhibit inclusiveness, the stronger its connection will be to the community it serves.

Results

The project planning commenced in August 2022, followed by the official planning kickoff meeting in January 2023. The go-live date was in late March 2023, with project implementation continuing through June 2023. The project outcomes and effectiveness were assessed through one process and three outcome measures. The specific aims were exceeded for

the three measured outcomes. Specifically, pre-to-post-education knowledge scores increased by 28%, surpassing the specific aim of a 20% increase. Moreover, PTSD screenings were administered to 95% of eligible patients (as compared to a specific aim of 80%), and 94% of patients classified as high-risk for PTSD development received a referral for mental health services upon discharge (as compared to a specific aim of 80%). The process measure of reviewing the daily trauma patient census ensured the outcomes were due to the intervention.

PTSD Education Module

A two-hour, evidence-based educational module was employed to educate staff and prepare them for project implementation. The module included PTSD risk factors, coping strategies, and the newly established screening protocol. A survey to assess knowledge was administered prior to and immediately after the training session. The training was initially conducted in February 2023. A second training session was held in early March to accommodate individuals from the Social Work department unable to attend the initial session due to staffing constraints created by a union strike. This change had no impact on the participants or project implementation timeline.

A total of 21 trauma staff participated in the training sessions. Demographic data on educational attainment, professional role in the trauma center, and years of professional experience were collected in the survey administered prior to the education session. All 21 staff members who participated had attained master's level education. Role distribution was social workers (n=17; 80%), a social work manager (n=1; 5%), advanced practice providers (n=2; 10%), and a case manager (n=1; 5%). Years of professional experience spanned six participants (29%) with ≤ 2 years of experience, four (19%) with 3-5 years of experience, seven (33%) with 6-10 years of experience, three (14%) with 11-15 years of experience, and one participant (5%)

with 16 or more years of experience. See Appendix P for Demographic Data and Education Outcomes.

All 21 participants completed the pre- and post-education surveys. The total mean score for correct answers pre-education was 9.2 (76.7%) out of 12 questions compared to a total mean score post-education of 11.8 (98.3%). Participants' overall knowledge score increased by 28.2% from baseline to post-education.

Notable results on the pre-education survey were three questions with a total mean score of 7.0 (58.3%) that improved to a perfect score of 12 for all 21 participants in the post-education survey:

- Q6 – *When implementing the Injured Trauma Survivor Screen (ITSS) tool in trauma care, what is its primary purpose?* – Total mean score = 7.0. Four participants (19%) scored below the mean; eight (38%) scored equal to the mean; and nine (43%) scored above the mean.
- Q8 – *Which PTSD risk score indicates high risk for PTSD development?* – Total mean score = 7.0. Five participants (24%) scored below the mean; seven (33%) scored equal to the mean; and nine (43%) scored above the mean.
- Q10 – *What is the primary and essential action that should be taken when a patient has been identified as high-risk for PTSD development*? – Total mean score = 7.0. Five participants (19%) scored below the mean; seven (38%) scored were equal to the mean; and nine (43%) scored above the mean.

All three of these survey questions were formulated in accordance with the updated screening protocol procedures, and the enhanced scores on the post-education survey underscored a proficient comprehension of the new process. Another noteworthy outcome pertained to a

question on which all 21 participants provided correct responses in both the pre- and post-education surveys:

- Q14 – *What is the primary distinction between PTSD and Acute Stress Disorder?* – 100% of participants answered this question accurately.

This outcome aligns with the research by Hunt et al. (2017) in a Level I Trauma Center, where 90% of participants demonstrated knowledge of the distinctions between PTSD and Acute Stress Disorder.

PTSD Screening and Mental Health Referrals

From March 2023 to June 2023, PTSD risk screening was performed on 169 out of 177 (95%) admitted trauma patients. Screening was performed by a qualified social worker, using the ITSS PTSD risk predictor screening tool. Of the 169 patients screened, 76 (45%) were categorized as low-risk, 57 (34%) were moderate-risk, and 36 (21%) were high-risk with respect to susceptibility to PTSD development (see Appendix Q).

Real-time monitoring of the screening process was initiated within the first three weeks of project implementation. This was of value in assessing the social workers' comprehension and execution of the screening process. The social workers showed a high degree of enthusiasm for assigning higher risk levels to patients. Case reviews conducted in collaboration with APPs and social workers revealed the social workers were classifying patients in the high-risk category based on their historical background rather than by thoroughly assessing current emotional states and symptoms. Targeted one-on-one educational interventions with the social workers were initiated, along with knowledge sharing sessions conducted during social work department meetings. These educational interventions led to more accurate risk categorization.

A retrospective review revealed eight patients had not undergone the PTSD risk screening. Six patients had been overlooked inadvertently, while two patients had declined the screening. To enhance efficiency and minimize the risk of missing patients in the screening process, the social workers proactively incorporated PTSD risk screening into their patient handoff notes, providing confidence that patients will not be overlooked in the future. Moreover, the social workers instituted a practice of documenting instances when patients declined to undergo screening. This documentation clearly distinguishes between patients who were inadvertently omitted from screening and those who declined to participate and helps the trauma team enhance the overall accuracy and effectiveness of the screening process.

The APPs employed an intervention algorithm to implement a systematic, stepwise intervention approach based on risk levels determined by the PTSD risk screening outcomes. Among the patients identified as high-risk, 34 out of 36 (94%) received an immediate mental health referral upon discharge, facilitating access to a comprehensive psychiatric outpatient mental health assessment (see Appendix R). A retrospective review revealed that the two patients not given a referral upon discharge had been overlooked. Measures were promptly initiated to establish post-discharge communication with these patients to facilitate connecting them with outpatient mental health services. The APPs took proactive measures to prevent similar oversights, specifically by adding a dedicated section to their discharge notes explicitly stating a patient's risk level. This information provides a prompt to guide initiating appropriate referrals during the discharge process.

Discussion

Summary

Early screening for PTSD risk is crucial to targeting high-risk patients for early intervention, and may even prevent PTSD development, as suggested by a mounting body of evidence in the literature. Several studies have shown that patients recover faster and achieve better long-term outcomes when healthcare providers prioritize comprehensive emotional and physical healing throughout the peri-trauma period following injury (Nehra et al., 2019; Shalev et al., 2019; Visser et al., 2017). Research by deRoon-Cassini et al. (2019) underscores that interventions administered within the first four weeks after injury have the most substantial impact on reducing subsequent PTSD development.

This DNP project achieved its aim of developing and implementing a PTSD risk assessment protocol in a Level II trauma center of a large healthcare organization. Three interrelated interventions were employed: a two-hour evidence-based education session for trauma center staff, patient PTSD risk screening at the bedside, and mental health referrals for high-risk patients. Three pivotal findings emerged from the project. First, through educating and engaging staff, implementation of a PTSD risk screening protocol can be quick and straightforward. Second, the trauma social workers were able to screen 95% of eligible trauma patients. Third, the APPs were able to make mental health referrals for 94% of high-risk patients upon discharge.

The gap analysis provided valuable insight into the lack of knowledge among trauma center staff regarding the risk of PTSD among trauma survivors. Thus, education centered on PTSD risk factors, trauma-informed care, and the new screening protocol became a core project intervention. PTSD risk training established a healthcare environment that emphasized the

holistic well-being of patients, encompassing their psychological health alongside their physical condition. Knowledge scores increased by 28% from baseline to post-education. Staff were actively engaged from the outset in project development and implementation, which fostered ownership of the process and outcomes. The project's relevance to their roles, an emphasis on active engagement, and the opportunity to transfer learning to practice align with what is known about adult learning.

The Level II trauma center lacked a screening process and the capacity to deliver interventions aimed at preventing or mitigating the onset of PTSD after injury. However, the hospital is fortunate to have dedicated staff committed to the care of trauma patients. Moreover, the trauma center has been engaged in other types of trauma screening and interventions with successful outcomes. Considering this, initial benchmarks were established for PTSD screening and mental health referrals for high-risk patients, with an initial target of 80%. Post-implementation outcomes demonstrated that 95% of patients underwent screening for PTSD risk, and 94% of those deemed high-risk received a mental health referral. One observation about the risk stratification of patients was that patients who underwent screening following a ground-level fall were categorized as low-risk 91% of the time. This observation prompted discussion of the criteria and relevance for screening patients who experience ground-level falls and will be a focal point in considering adjustments to the PTSD protocol for future implementation and sustainability.

The user-friendliness of the ITSS tool for patient screening was an unexpected benefit. Social workers confirmed that, in most cases, it took less than five minutes to conduct the PTSD screening, and screening could be seamlessly integrated into their existing assessments. Time constraints on staff who would be doing the screening were an important consideration in

choosing the tool, so this finding was welcome. Giving the social workers real-time feedback on the screening process enabled making straightforward adjustments to enhance effectiveness and augment the value of the screening outcomes.

Educating staff on trauma-informed care in a trauma center can advance nursing practice in several ways. Trauma-informed care recognizes the prevalence and impact of trauma on individuals and aims to create a safe and supportive environment for healing. Education and training on trauma-informed care that takes place within a trauma center setting can improve patient outcomes, improve job satisfaction among nurses, and contribute to a more compassionate and effective healthcare system (Nehra et al., 2019). While trauma-informed care and Peplau's Interpersonal Relations Theory originate from different contexts, they share common principles related to building trust, creating a safe environment, and empowering patients. Nurses and healthcare providers can integrate these approaches to better support patients, particularly those who have experienced trauma, in their recovery journey.

Other trauma centers will need to comply with new ACS requirements for mental health screenings after injury. This DNP project can be used to inform and assist other trauma centers as they seek to implement an evidence-based PTSD risk assessment protocol. Sharing the best practices that emerge will enable trauma centers to improve PTSD identification and treatment, benefiting patients with better health outcomes. Collaborative sharing also supports research for innovative PTSD screening approaches, which will benefit trauma survivors and healthcare.

Interpretation

A gap analysis at this Level II trauma center identified the absence of mental health screening for admitted trauma patients at the project site. In response, a project plan was developed, starting with a review of evidence in the recent literature to identify best practices for

implementing a PTSD risk screening strategy. A screening protocol was developed and implemented using the ITSS tool at the bedside. The trauma center social workers were able to screen 95% of the patients using the ITSS tool. This outcome was consistent with three studies that reported a 94% screening rate using the ITSS tool in a similar setting (deRoon-Cassini et al., 2019; Hunt et al., 2017; Petrucci et al., 2022). None of the literature reviewed for the current project had outcomes inconsistent with those of the DNP project, or the three studies cited.

In this project, 52% of the screened trauma patients had moderate to high risk of developing PTSD following their recent injury. These results revealed patients to be at higher risk compared to other studies reporting risk for PTSD development after injury within a range of 26- 42% (Dai et al., 2018; Hunt et al., 2017; Visser et al., 2017). The higher risk levels of patients at the current trauma center, as compared to other studies, may be attributable to the social workers' initial enthusiasm for the screening protocol, and a tendency to assign higher risk levels to patients during the first month of protocol implementation. An early retrospective analysis revealed some patients had been categorized as moderate to high-risk, primarily based on their historical backgrounds rather than on a comprehensive assessment of their current emotional states and symptoms. If these patients had been assessed accurately, the moderate to high-risk rate would have been 42%, which is more consistent with the published studies.

Implementing a PTSD risk screening protocol in a trauma center can have a positive impact on various aspects of the healthcare system. This project achieved regulatory compliance, enhanced staff proficiency in trauma-informed care, improved access to mental health resources for patients, and projected cost savings by reducing trauma-related readmissions. The protocol can be shared with other trauma centers to support the adoption of preventive approaches to mental health care. However, implementation of a PTSD risk screening protocol should consider

proper training, resource allocation, and ongoing evaluation to ensure effectiveness and sustainability. The 21% cost-benefit ratio in the financial analysis demonstrated in financial terms the desirability of using the PTSD risk screening protocol. In addition to having a positive impact on patient outcomes and well-being, use of a PTSD risk screening protocol makes a compelling case for resource allocation, as the anticipated benefits far outweigh the costs.

The project outcomes have several implications for leading and managing change within the healthcare organization. From project inception to completion, the project leadership team was adaptive, focused on continuous improvement, and committed to enhancing patient-centered care. These qualities contributed directly to the project's successful outcomes. Trauma center staff actively participated throughout the project's development and execution. Engaging the staff in this way cultivated feelings of ownership and commitment and recognized the significance of their contributions. The assessment did not directly measure outcomes of staff engagement beyond knowledge acquisition during the education session. However, informal observations and interactions with staff during implementation suggest that their sense of ownership in the screening protocol, coupled with their enthusiasm, contributed to the development of valuable skills immediately transferable to practice.

Peplau's theory provided a strong foundation for this project, supporting healthcare providers to create a therapeutic and supportive environment to achieve the project outcomes. Peplau's theory emphasizes trust, communication, and patient empowerment, which contributed to a trauma-informed and patient-centered approach to implementation of the PTSD risk screening protocol. An initial assumption in the project was an expectation of greater familiarity with trauma-informed care by providers with several years of service. However, the scores for trauma-informed care questions on the pre-education assessment indicated lower levels of

knowledge for employees with over five years of tenure. This unanticipated finding underscores the imperative of enhancing staff development initiatives in trauma-informed care.

Limitations and Barriers

A limitation recognized and addressed early in project implementation was the tendency of social workers to categorize patients at higher risk based solely on their background and not current symptoms. This led to misclassification of patients into the moderate to high-risk categories. Patient risk was represented in the data higher than would be reflected by the ITSS screening tool's intended use. A second limitation is that project outcomes may not be generalizable to trauma centers with dissimilar patient populations. The service area for the Level II trauma center where the project was implemented has a substantial population facing challenges related to social determinants of health. The short duration of the project introduced other limitations, as readmission data could not be collected to substantiate the cost-benefit projections, nor was it possible to ascertain the count of patients who would subsequently develop PTSD.

The primary barrier encountered was having the screening tool external to the electronic health record system. Consequently, social workers needed to screen patients using a paper-based tool and subsequently record the scores in the patient's assessment notes within the electronic health record. This presented a practical challenge for the APPs as they lacked immediate access to the specific questions for which patients scored high. This shortcoming made it necessary for them to retrieve the data directly from the paper chart up on the medical floor. Another barrier pertained to the timing of the screenings. Given the varying physical ailments and treatments of each patient, a consistent timeframe for the screenings could not be established. Thus, ensuring that every patient underwent screening prior to discharge became a

logistical burden. Social workers had to adapt their workflow to incorporate these screenings and verify their completion.

Conclusion

Long after the physical injuries have healed, exposure to a traumatic injury can contribute to the development of PTSD, resulting in a diminished quality of life, poor outcomes, and mental health issues. The review of evidence in the literature underscored the widespread existence of a significant mental health burden following traumatic injury. A growing body of literature indicates early screening to quantify the risk for PTSD can guide interventions to mitigate post-injury PTSD development. Given the complex relationship between traumatic physical injury and mental health, targeting high-risk patients is essential to reduce a patient's PTSD burden and improve outcomes. To address this issue in the DNP project, an innovative PTSD risk screening and intervention protocol was implemented at a Level II trauma center. The protocol provided the organization with a straightforward, cost-effective approach to identify PTSD-related morbidity. Screening hospitalized patients for PTSD risk, as compared to evaluating patients for a PTSD diagnosis after discharge, ensures that more individuals receive timely support in a manner accessible to them.

The PTSD risk screening protocol can be sustained by incorporating the educational module into annual competencies and new-hire orientation for trauma care. A goal to support sustainability is to add the screening tool to the electronic health record, which is expected to increase organization-wide efficiency and facilitate the continuum of patient care. Tracking of ground-level falls over six months is recommended to assess if the injury mechanism should be included or excluded from the PTSD risk screening process.

Several avenues for future research emerged from the DNP project. Comparative studies of the effectiveness of different PTSD risk screening tools or protocols in diverse healthcare

settings could help determine which approach yields the best results in terms of early detection and intervention. Qualitative exploration of the experiences and perspectives of trauma patients who have undergone in-hospital PTSD risk screening would contribute to an area of trauma-informed care where little is known.

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Appendix A

Evaluation Table

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses Feasibility / Conclusion(s) / Recommendation(s) /
deRoon-Cassini, T., Hunt, J. C., Geier, T. J., Warren, A. M., Ruggiero, K. J., Scott, K., George, J., Halling, M., Jurkovich, G., Fakhry, S. M., Zatzick, D., Brasel, K. J., & Hunt, J. D. (2019). Screening and treating hospitalized trauma survivors for PTSD and depression. *Journal of Trauma & Acute Care Surgery*, 87(2), 440-450. https://doi.org/10.1097/TA.0000000000002370							
To assess the current state of the literature on evidence-based screening techniques for PTSD in hospitalized trauma patients and synthesize the recent research on treatments with supportive evidence for treating PTSD depression quickly after injury	Literature review Search method included review of articles with screening tools for PTSD that are developed and validated for use in hospitalized traumatic injury populations No framework noted	6 literature reviews for screening for PTSD and 5 literature reviews for early PTSD interventions were performed Databases used were not disclosed	PTSD screening tools were evaluated for ability to best forecast PTSD trajectories post injury Early intervention techniques were reviewed based on symptoms and PTSD risk	No real measurement was used only analysis on tools available PTSD Checklist for DSM-5 (PCL-5) Post-traumatic Adjustment Scale (PAS) screen Injured Trauma Survivor Screen (ITSS) Peritraumatic distress inventory (PDI) Predictive Screening tool Automated EMR screening	An analysis of multiple articles on evidence-based screening tools available and treatments used to treat PTSD after injury	Three symptoms' screenings, two risk factor screenings, and one automated EMR screening were reviewed Most screenings are used to diagnose not predict PTSD. ITSS was the most valuable of the 6 tools evaluated with a sensitivity of 75%. PTSD had a specificity of 93.94 percent, while depression had a specificity of 95.50 percent	Level of evidence: Level V, good quality (B) Worth to practice: the value that this study brings is the information of available screening tools and brief interventions used for PTSD Strengths: has a clear summary on available tools with sensitivity/specificity, benefits and limitations listed Weakness: no description of sear Feasibility: this information can be used in my project to guide which tool is most predictive in a trauma center Conclusion: This review revealed that several screening tools are available to diagnose PTSD, but only a few are valuable in predicting the risk for post-traumatic stress disorder.

Definition of abbreviations: Post traumatic stress disorder (PTSD), PTSD Checklist for DSM-5 (PCL-5), Posttraumatic Adjustment Scale (PAS) Injured Trauma Survivor Screen (ITSS), Peritraumatic distress inventory (PDI), Electronic Medical Record (EMR)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Dai, W., Liu, A., Kaminga, A.C., Deng, J., Lai, Z. & Yang, J. (2018). Prevalence of acute stress disorder among road traffic accident survivors: a meta-analysis. *BMC Psychiatry, 18*(188). https://doi.org/10.1186/s12888-018-1769-9							
Aimed to identify the pooled prevalence of acute stress disorder and post-traumatic stress disorder among road traffic accident survivors	Meta-analysis Systematic Review	13 studies conducted in 8 countries. Total of 2989 road traffic accident survivors included	Acute stress disorder/post-traumatic stress disorder diagnosis was made from two days to four weeks following road traffic accident. Prevalence rates were provided	Loney criteria, SPSS, R version 3.4.1, Cochran's X^2 and I^2 statistics	Statistical subgroup analysis with mixed-model meta-regression analyses	Pooled prevalence of acute stress disorder 15.81% Between 57-92% of acute stress disorder diagnosed with post-traumatic stress disorder within 6 months. Concluded that failure to screen trauma survivors for mental health difficulties after injury deprives up to 90% of people with post-injury PTSD or depression of adequate care	Level II good quality (B) The findings indicated that, given the rapid increase in the occurrence of road traffic accidents worldwide and the survey's high pooled prevalence of acute stress and post-traumatic stress disorder among road traffic accident survivors, healthcare providers should assess and initiate psychosocial interventions early. Strengths included the diversity of the groups Weakness included the quality of the studies varied.

Definition of abbreviations: Post traumatic stress disorder (PTSD)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Conclusion(s) / Recommendation(s) /
Kampman, H., Hefferon, K., Wilson, M., & Beale, J. (2015). "I can do things now that people thought were impossible, actually, things that I thought were impossible": A meta-synthesis of the qualitative findings on post-traumatic growth and severe physical injury. *Canadian Psychology*, 56(3), 283-294. https://doi.org/10.1037/cap0000031							
Explores further understanding about the meaning of severe injury and the role of the body in post-traumatic growth (PTG) or a higher level of functioning after injury	Qualitative Meta-synthesis using metaethnography A systematic data screening of qualitative articles related to PTG and severe injury No conceptual framework noted	13 qualitative articles were synthesized related to PTG 10 semi- structured and 3 mixed methodologies PsycINFO, SPORTDiscus, CINAHL Plus, and Academic Search Complete were the databases used for article search	Looking at Identifying themes in injured patients related to PTG throughout the 13 articles	Synthesized first order constructs, second order and third order interpretations	Seven phases technique for themes Critical Appraisal Kills Program (CASP) and traffic light system were used for trustworthy	4 interrelated themes were identified Existential reflection, humanity, meaningful leisure engagement and new abilities: awareness of physiological and psychological potential Patients with low resilience consistently exhibited the least post traumatic growth after a traumatic injury patients who received education on coping skills, such as positive cognitive rumination techniques, reported having better ability to control their anxiety level and gain inner strength	Level of evidence: Level III, high quality (A) Worth: People who have suffered severe injuries may benefit from interventions that focus on acknowledging and accepting negative aspects of the injury and engaging in positive cognitive rumination, according to the practical implications highlighted in this meta-synthesis Strengths: searching for meaning in suffering, noticing the unchanged aspects of life (e.g., gratitude), and focusing on positive changes in life and relationships could be used as PTG facilitators Weaknesses: articles from as far back as 2004 and a large disparity in sample sizes Feasibility: useful information Conclusion: this data largely supports that early deployment of intervention therapies to promote resilience-related qualities Recommendations: useful information that can be used to help engaging in positive cognition rumination rather that negative

Definition of abbreviations: Post-traumatic stress disorder (PTSD), Post-traumatic growth (PTG), Critical Appraisal Kills Programme (CASP)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Manser, S.S., Houck, K., Kramer, M.D., Tabas, I.A., Brown, C. & Coopwood, B. (2018). Do screening and a randomized brief intervention at a Level I trauma center impact acute stress reactions to prevent later development of post-traumatic stress disorder?. *Journal of Trauma and Acute Care Surgery, 85*(3), 467-475. https://doi.org/10.1097/TA.0000000000001977							
To determine the feasibility and effective-ness of a PTSD screening and brief intervention with patients hospitalized at a Level I trauma center after injury	Prospective randomized controlled trial Patients with PTSD symptoms were randomized to an intervention or control group. A brief intervention was given to both. The control group received an additional 3-min educational brochure review. Both groups completed interviews in-hospital, 45 & at 90 days	1581 hospitalized trauma survivors admitted to Dell Seton Medical Center in Texas were reviewed for eligibility, and of those, 673 qualified to be screened for PTSD. Of the 673 screened patients, 26% (n=174) had at least one symptom of PTSD, and 140 agreed to enroll in the study	PTSD screening used was PC-PTSD Brief intervention used focused on symptom education and normalization, coping strategies, and utilizing support and a 3-min educational brochure on PTSD was given	Primary Care-PTSD screen Post-traumatic Adjustment Scale 17-item PTSD Checklist-Civilian Version reflects Diagnostic & Statistical Manual of Mental Disorders Fifth Edition and is validated for PTSD in clinical & research settings	Multiple linear regression Point-biserial correlations Root mean square error of approximation Comparative fit index Software: SPSS Version 24 Mplus Version 7	62% of patients at 45 days and 49% of patients at 90 days met PTSD criteria 26% of the trauma survivors had at least one symptom of PTSD prior to discharge PTSD screen was successful in predicting later PTSD at both 45 ($\beta = 0.43$, $p < 0.001$) and 90 days ($\beta = 0.37$, $p < 0.001$) RMSEA is 0.068, CFI is 0.913. Overtime, the mean had a minor change, with standardized estimates of −0.27, 0.05, −0.09, and −0.15 for the reexperiencing, avoidance, dysphoria, and hyperarousal factors. No sig	Level of evidence: Level I, good quality (B) Worth: It provided evidence that conducting follow-up care for trauma survivors is beneficial. It showed that risk can be assessed, and early intervention can help improve outcomes. Strengths: good quality article that clearly stated aim and results that provided evidence-based recommendations Weaknesses: The bedside screening was not made available to all eligible admitted patients, which may have skewed the results. Feasibility: this article is able to be used to guide interventions Conclusion: A PTSD screening is helpful in identifying those at highest risk and that there is value in providing a brief intervention while in the hospital. Recommendation: implementing a PTSD screening is supported and is important in identifying at risk patients and providing interventions while in the hospital to improve long term outcomes.

Definition of abbreviations: Post-traumatic stress disorder (PTSD), Root mean square error of approximation (RMSEA), Comparative fit index (CFI)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Nehra, D., Herrera-Escobar, J. P., Al Rafai, S. S., Havens, J., Askari, R., Nitzschke, S., Velmahos, G., Kasotakis, G., Brasel, K. J., Levy-Carrick, N., Salim, A. & Haider, A. (2019). Resilience and long-term outcomes after trauma: An opportunity for early intervention? *Journal of Trauma and Acute Care Surgery, 87*(4), 782-789. https://doi.org/10.1097/TA.0000000000002442							
Explore the link between patient self-reported resilience characteristics and functional and psychosocial outcomes 6 & 12 months after a traumatic injury	Prognostic/ Correlation study	790 trauma patients from a Level I trauma center met inclusion criteria during the timeframe of the study. In the end, 305 patients were enrolled in the study and completed the interview	This study interviewed severely injured patients from a Level I trauma center via phone at 6 months and 12 months. The interview consisted of an initial screening and a series of questions that assessed functional, and patient centered outcome measures that were related to the recovery experience using a validated Trauma Quality of Life survey and PTSD screen. The patients were then classified into a low or high resilience category according to a Likert scale	Trauma Quality of Life survey & PTSD screening	X^2 tests, *t* tests, and Wilcoxon rank sum tests. A multivariable-adjusted logistic regression model was built to compare the results	Results showed that 204 (67%) of the participants were classified as having low resilience, and their long-term outcomes were consistently lower. Nehra et al. also noted that among participants, screening positive for PTSD was seen in both low and high resilient patients after injury, 35% and 20% respectively Early treatment started immediately after injury had improved outcomes	Level II, a high-quality (A) paper with a clear goal and results, as well as evidence-based suggestions

Definition of abbreviations: Post-traumatic stress disorder (PTSD)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Conclusion(s) / Recommendation(s) /
Ravn, S. L., Eskildsen, N. B., Johnsen, A. T., Sterling, M., & Andersen, T. E. (2020). There's nothing broken. you've had a whiplash, that's it: A qualitative study of comorbid post-traumatic stress disorder and whiplash associated disorders. *Pain Medicine,* 21(8), 1676-1689 https://doi.org/10.1093/pm/pnz369							
Investigate the potential relationship between PTSD and pain from whiplash after a motor vehicle accident	Qualitative explorative study using face to face semi structured interviews Add on study to a multicenter randomized controlled trial on trauma focused cognitive behavioral therapy and exercise for people with Whiplash associated disorders (WAD) and PTSD	8 participants from Denmark Germany area form multiple hospitals	Looking at Identifying themes and potential relationship of PTSD and pain after an MVC	Average neck pain intensity using 11-point numerical rating scale PTSD severity score using Clinician Administered PTSD Scale for DSM-5 (CAPS-5)	Framework analysis	3 themes identified The first theme demonstrated the comorbidity's complexity and burden through synchronous and transdiagnostic indicators., The next theme discussed how a variety of factors, some of which are tied to the health care system, might prolong and increase the traumatic response. The third topic illustrated sympto m connections, notably those between pain and post-traumatic stress disorder	Level of Evidence: Level III, good quality (B) Worth: useful value Strength: this article was clear in how it supports that by having a greater understanding of the patients' experiences (i.e., stressors, feelings, thoughts, and pain perception) following injury, providers can support full emotional and physical healing Weakness: The participants were recruited from a randomized controlled trial as an add-on, and some of the participants in this small study had already participated in some therapy. Feasibility: useful Conclusion: The themes emphasized the importance of conducting a complete assessment and providing specialized and interdisciplinary care to address a wide range of symptoms that can lead to PTSD

Definition of abbreviations: Whiplash associated disorders (WAD), Clinician Administered PTSD Scale for DSM-5 (CAPS-5), Post-traumatic stress disorder (PTSD), Motor vehicle crash (MVC)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Shalev, A.Y., Gevonden, M., Ratanatharathorn, A., Laska, E., van der Mei, W.F., Qi, W., Lowe, S., Lai, B.S., Bryant, R.A., Delahanty, D., Matsuoka, Y.J., Olff, M., Schnyder, U., Seedat, S., deRoon-Cassini, T.A., Kessler, R.C. & Koenen, K.C. (2019). Estimating the risk of PTSD in recent trauma survivors: Results of the International Consortium to Predict PTSD (ICPP). *World Psychiatry, 18*(1), 77-87. https://doi.org/10.1002/wps.20608							
Determine the probability of meeting PTSD diagnostic criteria after an acute care admission for a traumatic injury	Mega-analysis	13 longitudinal acute care based studies in 6 countries 2473 participants	Risk indicators, symptom severity	DSM-IV PTSD PTSD Scale for DSM-IV (CAPS)	Mann-Whitney tests and X^2 tests Logistic regression model and Brier score	Prevalence of follow-up PTSD was 11.8% Accurate risk estimates (r = 0.976) Females with less than a secondary education and exposure to prior interpersonal trauma had a 34% higher risk compared to men Early interventions reduce the prevalence of PTSD. Early symptom severity can be used as a predictor for PTSD early cognitive-behavioral interventions significantly reduce the prevalence of PTSD	Level I Systematic Review High quality (A)

Definition of abbreviations: Post-traumatic stress disorder (PTSD), Clinician Administered PTSD Scale for DSM-5 (CAPS-5)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Stein, M. B., Jain S., Giacino, J. T., Levin, H., Dikmen, S., Nelson, L. D., Vassar, M. J., Okonkwo, D. O., Diaz-Arrastia, R., Robertson, C. S., Mukherjee, P., McCrea, M., Mac Donald, C. L., Yue, J. K., Yuh, E., Sun, X., Campbell-Sills, L., Temkin, N. & Manley, G. T. (2019). Risk of post-traumatic stress disorder and major depression in civilian patients after mild traumatic brain injury: A TRACK-TBI study. *JAMA Psychiatry, 76*(3), 249-258. https://doi.org/10.1001/jamapsychiatry.2018.4288. PMID: 30698636; PMCID							
determine the frequency and risk factors for PTSD and MDD in patients assessed in the ED for mild traumatic brain injury compared to orthopedic injuries	Prospective longitudinal cohort study	1155 patients from level I trauma center with TBI or orthopedic injury	Risk factors and symptoms evaluated included preinjury and injury characteristics	DSM-5 Patient Health Questionnaire-9 item	Cross-sectional analysis X^2 and *t* tests. Probable PTSD (PTSD Checklist for DSM-5 score, >33) and MDD (Patient Health Questionnaire-9 Item score, >15) at 3, 6, and 12 months postinjury.	At three months, the weighted prevalence of PTSD was 20% in the TBI compared to 8.7% orthopedic trauma groups. At six months TBI was in 21% vs 12% in orthopedic patients. following mTBI, risk variables for likely PTSD were a lack of education. (adjusted odds ratio, 0.89; 95% CI, 0.82-0.97 per year), being African American(adjusted odds ratio, 5.11; 95% CI, 2.89-9.05), having a psych history (adjusted odds ratio, 3.57; 95% CI, 2.09-6.09), and was injured in an	Level II good quality (B)

Purpose of Article or Review	Design / Method / Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
						assault or violent occurrence (adjusted odds ratio, 3.43; 95% CI, 1.56-7.54). evidence that patients suffering a TBI are at greater risk for PTSD. This source also confirms that patients that have mental health issues prior to injury are at a higher risk to develop PTSD. Lastly, this source shows that high risk patients should get surveillance and interventions early.	

Definition of abbreviations: Post-traumatic stress disorder (PTSD), Traumatic Brain Injury (TBI), Major Depression Diagnosis (MDD), Clinician Administered PTSD Scale for DSM-5 (CAPS-5), Emergency Department (ED)

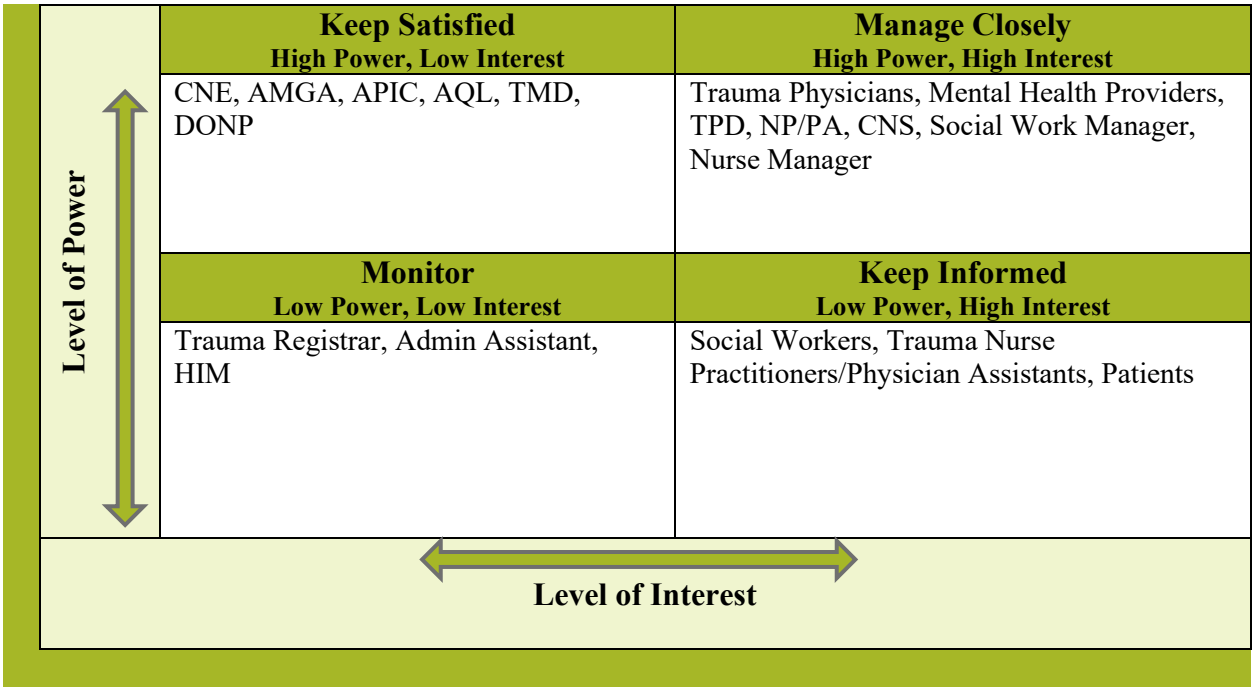
Purpose of Article or Review	Design /Method/ Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Hunt, J., Sapp, M., Walker, C., Warren, A. M., Brasel, K. & deRoon-Cassini, T. A. (2017). Utility of the injured trauma survivor screen to predict PTSD and depression during hospital admission, *Journal of Trauma and Acute Care Surgery, 82*(1), 93-101. https://doi.org/10.1097/TA.0000000000001306							
Examined the utility of the Injured Trauma Survivor Screen tool compared to other post-traumatic stress disorder screening tool during hospitalization after injury.	Prognostic study	139 Adult patients at two level I trauma centers completed an injured trauma survivor screening at time of injury. At one month post injury they were administered an established post-traumatic stress disorder diagnostic screening	Prevalence of post-traumatic stress disorder	Injured trauma survivor screening tool (ITSS), Post traumatic stress disorder scale for DSM-5 (CAPS-5) and Post traumatic stress disorder checklist for DSM-5 (PCL-5)	Stepwise logistic regression and ROC curve analysis	Prevalence rate of post-traumatic stress identified on the Injured Trauma Survivor Screen was 28%. 72.7 - 75.00 sensitivity and 93.94 specificity Integrating psychological therapies, such as psychoeducation, into routine care useful in destigmatizing and normalizing mental healthcare Recommended stepped intervention approach to treatment interventions occurring within the first four weeks of injury yielded the most significant effects	Level III Good quality (B) The study provides evidence that the ITSS can help predict which injured trauma survivors admitted are at the highest risk for developing PTSD and depression. Weakness included only conducting at 2 centers

Purpose of Article or Review	Design /Method/ Conceptual Framework	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
Visser, E., Gosens, T., Den Oudsten, B. L. & De Vries, J. (2017). The course, prediction, and treatment of acute and post-traumatic stress in trauma patients. *Journal of Trauma and Acute Care Surgery, 82*(6), 1158-1183. https://doi: 10.1097/TA.0000000000001447							
Aim was to review incident rates and predictors of ASD and PTSD in trauma patients.	Systematic review	66 articles were systematically reviewed. 43 prospective cohort, 2 prospective case-control, and 21 intervention studies	Only included articles that examined the course and or predictors of ASD or PTSD.	Not stated	STROBE AND CONSORT checklists	Prevalence rates for PTSD in trauma survivors ranging from 17.5% to up to 42% at one to six months post-injury Predictors such as low resilience, poor coping skills, and a lack of support systems are useful in determining risk Rumination is one of the strongest predictors of PTSD	Level III High quality (A) The results showed that PTSD was possible after injury and that early treatment started within first few weeks after the injury were the most effective Weakness included the heterogeneity of the different studies

Definition of abbreviations: Post traumatic stress disorder (PTSD), Acute stress disorder (ASD), Strengthening the Reporting of Observational studies in Epidemiology (STROBE), Consolidated Standards of Reporting Trials (CONSORT)

Appendix B

Stakeholder Analysis



Abbreviations: CNE – Chief Nurse Executive, AMGA – Assistant Medical Group Administrator, APIC – Assistant Physician in Chief, AQL – Area Quality Leader, TMD – Trauma Medical Director, DONP – Director of Nursing Practice, TPM – Trauma Program Director, NP – Nurse Practitioner, PA – Physician Assistant, CNS – Clinical Nurse Specialist, HIM – Health Information Management

Appendix C

Injured Trauma Survivor Screen (ITSS) Approval Letter

From: deRoon-Cassini, Terri <[redacted]>
Sent: Friday, August 22, 2022 8:22 AM
To: Christine McGahey <Christine.McGahey@kp.org>
Subject: Re: PTSD ITSS

Caution: This email came from outside Kaiser Permanente. Do not open attachments or click on links if you do not recognize the sender.

HI Christine,

Thanks again for your kind words at the meeting earlier in the week – I am excited about your doctoral project.

Feel free to use the ITSS. I have included the manual as well as the Spanish version if interested, and the citation for the ITSS is below.

- Utility of the injured trauma survivor screen to predict PTSD and depression during hospital admission. (Hunt JC, Sapp M, Walker C, Warren AM, Brasel K, deRoon-Cassini TA) J Trauma Acute Care Surg 2017 Jan;82(1):93-101 PMID: 27787440 Scopus ID: 2-s2.0-84992751905 10/28/2016

Terri A. deRoon-Cassini, Ph.D., M.S.
Professor of Surgery (Trauma & Acute Care Surgery),
Psychiatry & Behavioral Medicine, Institute for Health and Equity
Medical College of Wisconsin
Executive Director – Comprehensive Injury Center
Director – Trauma Psychology Program
Co-Director, Milwaukee Trauma Outcomes Project
Pronouns: She/her/hers

From: Christine McGahey <Christine.McGahey@kp.org>
Date: Tuesday, August 19, 2022 at 4:03 PM
To: "deRoon-Cassini, Terri" <tcassini@mcw.edu>
Subject: PTSD ITSS

ATTENTION: This email originated from a sender outside of MCW. Use caution when clicking on links or opening attachments.

I wanted to express my gratitude for your insightful presentation on PTSD today. I'm reaching out to request permission to use the ITSS along with its user guide. I'm planning to implement these resources in my Level II trauma center as part of my DNP project, which aims to establish a PTSD screening protocol. To carry out this screening, I'll be collaborating with my team of dedicated social workers.

Your expertise and knowledge on this important matter are truly appreciated. It was a pleasure meeting you today, and I must say that your articles have been incredibly valuable in shaping my own work.

Thank you once again for your contributions.

Christine McGahey, RN MSN
Trauma Program Director
Kaiser Permanente
South Sacramento Medical Center
Level II Trauma Center
Mobile (916)204-4975
Office (916)688-2696
Christine.McGahey@kp.org

Appendix D

Injured Trauma Survivor Screen (ITSS) Tool

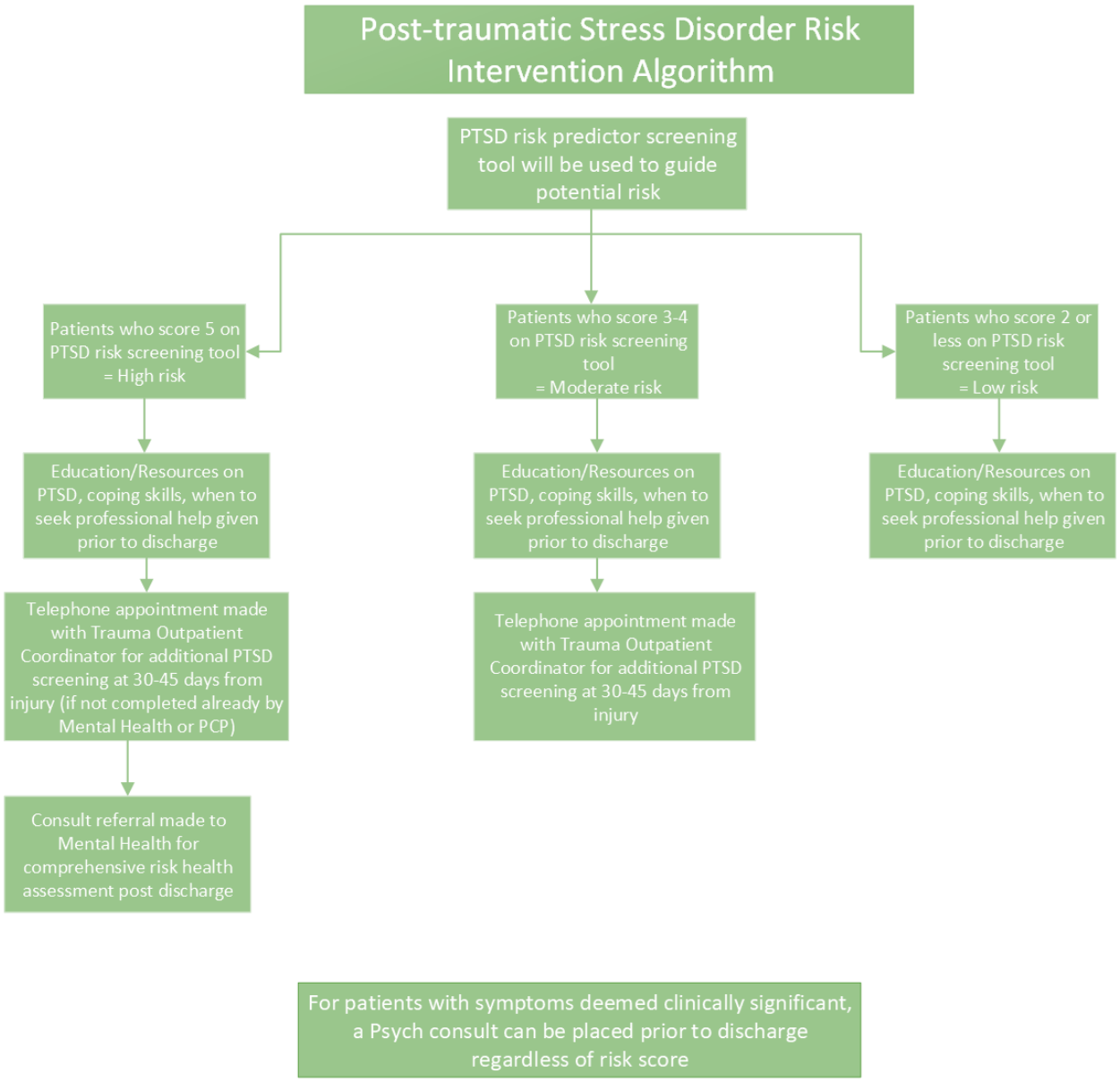
Injured Trauma Survivor Screen (ITSS)

	1 = Yes 0 = No PTSD	1 = Yes 0 = No Depression
Before this injury		
1. Have you ever taken medication for, or been given a mental health diagnosis?		1 0
2. Has there ever been a time in your life you have been bothered by feeling down or hopeless or lost all interest in things you usually enjoyed for more than 2 weeks?		1 0
When you were injured or right afterward		
3. Did you think you were going to die?	1 0	1 0
4. Do you think this was done to you intentionally?	1 0	
Since your injury		
5. Have you felt emotionally detached from your loved ones?		1 0
6. Do you find yourself crying and are unsure why?		1 0
7. Have you felt more restless, tense or jumpy than usual?	1 0	
8. Have you found yourself unable to stop worrying?	1 0	
9. Have you found yourself thinking that the world is unsafe, and that people are not to be trusted?	1 0	
SUM=		
Scoring PTSD – Low risk ≤ 2, Moderate risk 3-4, High risk 5 Depression - ≥ 2 is positive for Depression risk		

This predictor tool is NOT diagnostic, it is only to be used to guide for potential risk and interventions that may help decrease the likelihood that patient will develop PTSD in the future

Appendix E

Stepped Intervention Algorithm



Appendix F

PTSD Risk Educational Module

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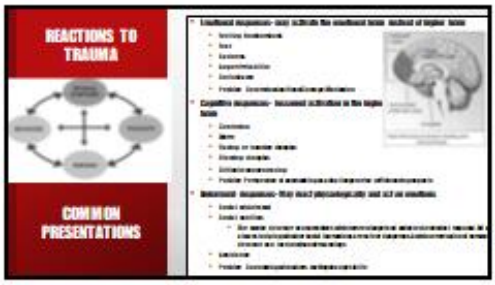

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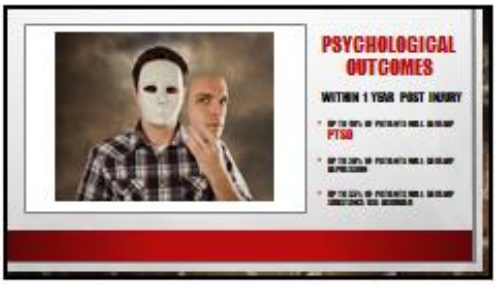

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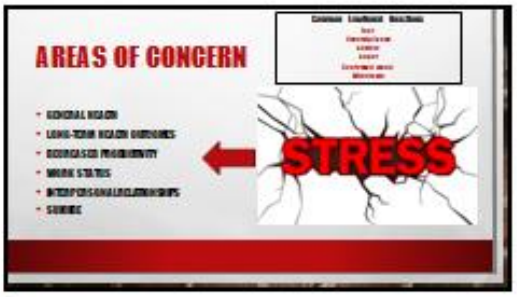
AREAS OF CONCERN
STRESS

7


COMORBID DIAGNOSIS
INDIVIDUALS WITH PTSD ARE 80% MORE LIKELY TO HAVE SYMPTOMS THAT MEET DIAGNOSTIC CRITERIA FOR AT LEAST ONE OTHER PSYCHIATRIC DISORDER, INCLUDING MOOD AND SUBSTANCE USE DISORDERS
Depression
Panic attacks
Anxiety disorders
Personality disorders – comorbidity with repeated trauma
Substance Use Disorder
MODELS EXPLAINING COMORBIDITY RELATED TO SUD
Shared Liability Model
Self-medication Model
Susceptibility Model
PTSD and substance use affect each other

8


RISK FACTORS FOR PTSD
MORE THAN 1/3 OF INDIVIDUALS EXPOSED TO A SEVERE TRAUMATIC EVENT WILL DEVELOP PTSD
R
I
S
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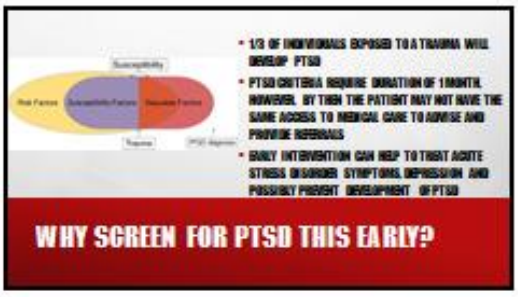

1/3 OF INDIVIDUALS EXPOSED TO A TRAUMA WILL DEVELOP PTSD
PTSD CRITERIA REQUIRE DURATION OF 1 MONTH. HOWEVER, BY THEN THE PATIENT MAY NOT HAVE THE SAME ACCESS TO MEDICAL CARE TO ADVISE AND PROVIDE REFERRALS
EARLY INTERVENTION CAN HELP TO TREAT ACUTE STRESS DISORDER SYMPTOMS, DEPRESSION AND POSSIBLY PREVENT DEVELOPMENT OF PTSD
WHY SCREEN FOR PTSD THIS EARLY?

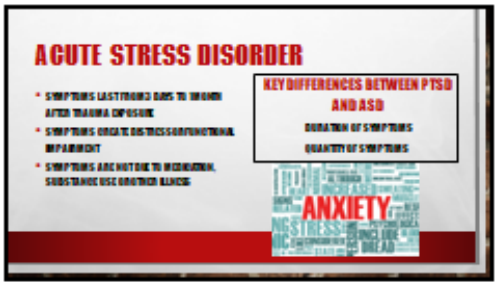
10


ACUTE STRESS DISORDER
STRESS

11


ACUTE STRESS DISORDER
DEFINITION VIRTUALLY THE SAME AS PTSD BUT CRITERIA IS DIFFERENT...

12



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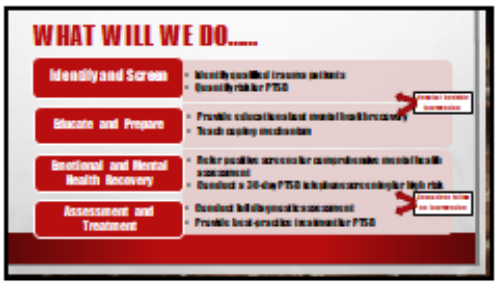

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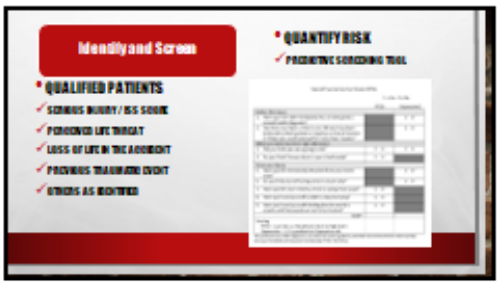

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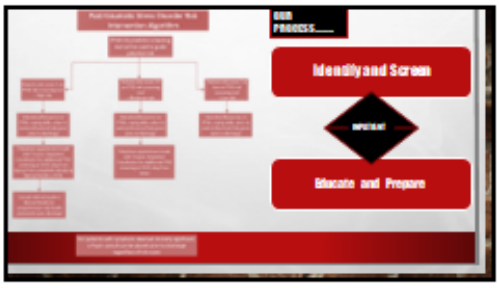


18


EDUCATION TOOLS...
HOW TO GET HELP

19


Emotional and Mental Health Recovery
Assessment and Treatment
MOST IMPORTANTLY WE ARE THE UNIT THAT CONNECTS THEM WITH PSYCHOLOGICAL TREATMENT
PTSD telephone screening completed between 30-45 days after accident
Road to Recovery
Full diagnostic health assessment
Comprehensive mental health assessment
Best practice treatment for PTSD

20


LETS PRACTICE...

21


QUESTIONS?????

22

Appendix G

Gap Analysis

PTSD Risk Screening Process			
Current State Currently there is no PTSD risk screening process for admitted trauma patients		**Best Practice** Implement a PTSD risk screening process to stratify risk and provide intervention to at risk patients	
Item	**Current State**	**Desired State**	**Action Items**
Screening for PTSD risk in admitted trauma patients	There is no current PTSD risk screening for admitted trauma patients	Admitted trauma patients are screened for PTSD risk after a traumatic injury	• Selection of validated screening tool • Develop a PTSD screening process flow map • Develop a script for screening
PTSD risk prevention interventions for admitted trauma patients	There are no current intervention measures provided to admitted trauma patients for prevention of PTSD development	At risk trauma patients will be provided with education and coping strategies related to PTSD development while in the hospital	• Design evidence- based intervention algorithm
Staff knowledge on PTSD in trauma survivors	There is a deficit in staff knowledge regarding PTSD screening and prevention measures	Increased staff knowledge and understanding of PTSD screening process and prevention measures	• Develop and provide education and training for staff on PTSD symptoms and prevention measures

Abbreviations: PTSD-Post Traumatic Stress Disorder

Appendix H

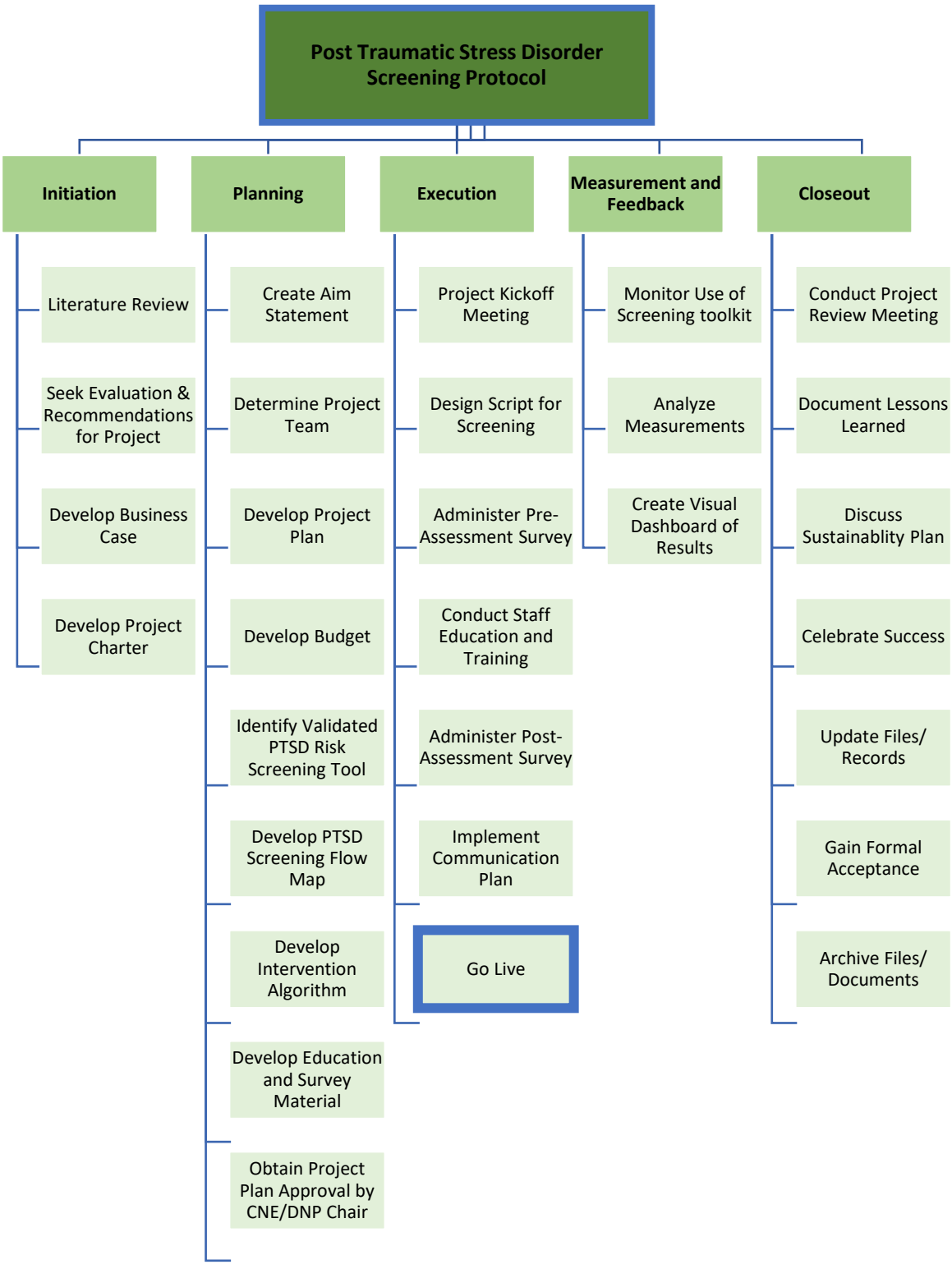
GANTT

Initiation	2022												2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Literature Review																								
Evaluation and Recommendations																								
Develop Business Case																								
Develop Project Charter																								
Planning	2022												2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Create Aim Statement																								
Determine Project Team																								
Develop Project Plan																								
Develop Budget																								
Identify PTSD Risk Screening Tool																								
Map Proposed PTSD Screening																								
Develop Intervention Algorithm																								
Develop Education and Survey																								
Obtain Approval by CNE/DNP Chair																								
Execution	2022												2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Project Kickoff Meeting																								
Design Script for Screening																								
Administer Pre-Assessment Survey																								
Conduct Staff Education and																								
Administer Post-Assessment																								
Implement Communication Plan																								
Project Go Live																								
Measurement and Feedback	2022												2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monitor Use of Screening Toolkit																								
Analyze Measurements																								
Create Visual Board of Results																								
Closeout	2022												2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Conduct Project Review Meeting																								
Document Lessons Learned																								
Discuss Sustainability Plan																								
Celebrate Success																								
Update Files/Records																								
Gain Formal Acceptance																								
Archive Files/Documents																								

Color Key
Initiation
Planning
Execution
Measurement and Feedback
Closeout

Appendix I

Work Breakdown Structure (WBS)



Appendix J

Responsibility/Communication Plan

Communication	Purpose	Format/Medium	Frequency	Audience
Executive Stakeholder Meeting	• Present the concept of the project to gain support and approval • Review project objectives and obtain feedback • Provide updates on the project status and outcomes	Virtual Teams meetings Share Point Email	Quarterly and as needed	CNE, AMGA, APIC, AQL, TMD, DONP, DCOC
Multidisciplinary Meetings	• Project planning • Project development • Strategy preparation • Develop education • Project kickoff • Analyze pre- and post-education survey assessment	Virtual Teams meetings Share Point Email	Monthly and as needed	Trauma Lead, Mental Health Lead, Trauma NP/PA, Trauma CNS, SW Lead, Nurse Lead Ad hoc: Trauma Registrar, Admin Assist, HIM
Education and Training	• Administer pre-assessment survey • Perform 2-hour education series • Administer post-assessment survey	In-person meeting	1-2 sessions	Social Workers, Nurse Practitioners and Physician Assistants
Project Review Meeting	• Analyze project measurements • Document lessons learned	Virtual Teams meetings Share Point Email	Once	Trauma Lead, Mental Health Lead, Trauma NP/PA, Trauma CNS, SW Lead, Nurse Lead Ad hoc: Trauma Registrar, Admin Assist, HIM

Abbreviations: CNE – Chief Nurse Executive, AMGA – Assistant Medical Group Administrator, APIC – Assistant Physician in Chief, AQL – Area Quality Leader, TMD – Trauma Medical Director, DONP – Director of Nursing Practice, DCOC – Director of Continuity of Care, NP – Nurse Practitioner, PA – Physician Assistant, CNS – Clinical Nurse Specialist, SW – Social Worker, HIM – Health Information Management

Appendix K

SWOT Analysis

	Favorable/Helpful	Unfavorable/Harmful
Internal (attributes of the organization)	**Strengths** • Level II trauma center verified by the American College of Surgeons (ACS) • Trauma certified nurses • Trauma CNS as subject matter expert • Dedicated trauma Social Worker • Dedicated trauma floor/wing • Trauma education is part of annual skills • In-house trauma registry used for data collection	**Weaknesses** • Complex patient load • Lack of time to perform screening tools • Efficacy of the tool is highly dependent on level of acceptance and compliance among tool users • Physician engagement in making referrals • Change fatigue • Changes in organizational leadership
External (attributes of the organization)	**Opportunities** • Magnet journey • Clinical nurse ladder program • Improving patient safety is a priority • Psychiatry residents • Updated ACS standards require PTSD risk screening process at trauma centers • Leader readiness to adopt new ideas	**Threats** • Lack of mental health access after discharge • Concurrent QI projects competing for resources

Appendix L

Budget and Cost-Benefit Analysis

	Year 1	Year 2	Year 3
Expenses for PTSD Protocol			
Initial Education & Training*			
Nurse Practitioner/Physician Assistant (3)	$680.00	N/A	N/A
Social Worker (9)	$774.00	N/A	N/A
Trauma Registrar (2)	$68.00	N/A	N/A
Project Coordinator Labor	$3,960.00	N/A	N/A
Education Materials	$120.00	N/A	N/A
Supplies	$108.00	N/A	N/A
New Hire/Annual Education & Training**			
Nurse Practitioner/Physician Assistant (3)	N/A	$347.00	$354.00
Social Worker (9)	N/A	$376.00	$384.00
Total Expenses	$5,710.00	$723.00	$738.00

Cost-Benefit Analysis			
Trauma Readmission***	$15,200.00	$15,428.00	$15,659.00
Total Expenses for PTSD Toolkit	$5,710.00	$723.00	$738.00
Net Cost-Benefit	$9,490.00	$14,705.00	$14,921.00
Cost-Benefit Ratio	2.7%	21.3%	21.2%

*Hourly wage with 35% benefits
**Hourly wage with 35% benefits and 2% increase in pay year over year
***Assuming PTSD Toolkit avoids one trauma readmission with 1.5% rate of inflation increase year over year

Appendix M

Educational Survey

PTSD Risk Screening Protocol

Q0 The objective of this survey is to evaluate your knowledge on the utilization of a Post-traumatic Stress Disorder risk screening process in a Level II trauma center. Your participation will remain confidential, and your responses will be grouped with those of others to assess knowledge enhancement before and after the educational intervention. Completing this survey should require no more than 10 minutes of your valuable time. It is important to note that this survey does not constitute a research study.

- ○ I agree to take this survey
- ○ No, I do not agree to take this survey. Please close survey

---

Q1 What is the highest level of educational attainment you have achieved?

- ○ High School Diploma or GED
- ○ Some College or Associate's Degree
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ Doctorate (Ph.D., DNP, MD, etc.)

Q2 What is your professional role within the trauma center?

- ○ Registered Nurse
- ○ Social Worker
- ○ Advanced Practice Provider
- ○ Manger or Director
- ○ Medical Doctor

Q3 How many years of experience do you have in the healthcare field?

- ○ 2 years or less
- ○ 3-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16 or more years

Q4 PTSD can be diagnosed at which time frame? (mark all that apply)

- 1-29 days after the event
- 30-45 days after the event
- 3 to 6 months after the event
- All of the above

Q5 What factor is considered one of the most influential determinants affecting the post-injury quality of life for trauma survivors?

- Development of physiological distress
- Development of psychological distress
- Hospital length of stay
- How long rehabilitation will take

Q6 When implementing the Injured Trauma Survivor Screen (ITSS) tool in trauma care, what is its primary purpose?

- To assess a patient's physical injuries
- To diagnose PTSD
- To screen for potential stressors and risk factors contributing to PTSD development
- To measure a patient's overall stress levels

Q7 Which of the following are not a contributing factor to consider when evaluating for risk of PTSD?

- Ineffective coping strategies
- Socioeconomic status
- History of previous trauma
- Lack of support system

Q8 Which PTSD risk score indicates high risk for PTSD development using the ITSS tool?

- 2-3
- 6-8
- 5
- 15 or higher

Q9 Which of the following has the potential to mitigate the severity of PTSD before the development of chronic or delayed PTSD?

- Early identification
- Early treatment
- Aggressive pharmacological treatment
- Aggressive psychological treatment

Q10 What is the primary and essential action that should be taken when a patient has been identified as high-risk for PTSD development?

- Provide a mental health referral
- Appropriate pharmacological treatment
- Show your support and offer a hug
- Provide education and resources at the bedside

Q11 Within the context of trauma-informed care, what does the "Four R's" framework primarily aim to achieve?

- Rapid response, recovery, and resilience
- Recognition, response, resilience, and resistance
- Resistance, recovery, rehabilitation, and reconciliation
- Risk assessment, response, recovery, and reintegration

Q12 What is the approximate percentage of injured patients who experience life-threatening injuries subsequently develop PTSD following their injury?

- 10% or less
- 20% to 25%
- 30% to 40%
- 50% or more

Q13 When conducting a PTSD risk screening using trauma-informed care, what is a key principle healthcare professionals should adhere to in order to avoid re-traumatizing a victim?

- Rapidly ask the questions to gather all necessary information needed
- Minimize the patient's involvement in the screening process to reduce distress
- Avoid discussing any past traumatic experiences to prevent emotional distress
- Create a safe and supportive environment, using sensitive and nonjudgmental language

Q14 What is the primary distinction between PTSD and Acute Stress Disorder?

- Type of traumatic event
- Duration of symptoms following a traumatic event
- Intensity of the symptoms experienced
- The age group most commonly affected

Q15 Which of the following symptoms are commonly associated with PTSD? Select all that apply:

- Rumination
- Sense of helplessness
- Hyper-arousal symptoms
- Avoidance

Appendix N

Letter of Support

KAISER PERMANENTE®

South Sacramento Medical Center
6600 Bruceville Road
South Sacramento, CA 95823

June 29, 2022

To the University of San Francisco:

Please accept this letter as support of Chris McGahey's Doctor of Nursing Practice (DNP) project to develop, implement, and evaluate a standardized risk assessment tool for post-traumatic stress disorder (PTSD) in the acute trauma patient population.

Sincerely,

Rachel Wyatt DNP, MHA, RN, NEA-BC
Chief Nurse Executive

Appendix O

Statement of Determination

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

Doctor of Nursing Practice
Statement of Non-Research Determination (SOD) Form

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749/A/E

General Information

Last Name:	McGahey	**First Name:**	Christine
CWID Number:	20670216	**Semester/Year:**	4th Semester Fall 2022
Course Name & Number:	N792P Designing an Evidence-Based Change of Practice Project		
Chairperson Name:	Francine Serafin-Dickson	**Advisor Name:**	Francine Serafin-Dickson
Second Reader Name	Elena Capella		

Project Description

1. **Title of Project:**

   A Focus on Mental Health Recovery After Trauma

2. **Brief Description of Project*:***

   Every year, 2.8 million Americans suffer severe traumatic injuries and are hospitalized in a trauma center. Traumatic injuries affect both the physical and emotional health of the victim, and survivors are frequently unaware of how to cope with their emotional responses. According to the American College of Surgeons Committee on Trauma (2022), approximately 20% to 40% of trauma survivors experience post-traumatic stress disorder (PTSD) after injury. The American College of Surgeons Committee on Trauma also supports screening and treatment for PTSD, reflecting a growing awareness of the importance of addressing mental health issues following trauma. A significant body of literature suggests that early screening to quantify the risk for PTSD can directly focus on early interventions that may help prevent the disorder in high-risk patients. Unfortunately, patients admitted to trauma centers are rarely evaluated for PTSD or educated about its long-term repercussions. This project responds to this problem by proposing the implementation of a PTSD risk screening strategy to assess the risk and deliver

brief interventions to at-risk patients to avoid or mitigate the severity of PTSD. Implementing a PTSD risk screening protocol can provide a trauma center with three key benefits: a better understanding of the prevalence of PTSD in trauma patients; expanded access to mental healthcare for patients; and improved patient-centered outcomes.

3. AIM Statement: What are you trying to accomplish?

The purpose of this Doctor of Nursing Practice evidence-based change project is by June 2023, the trauma center will develop, implement, and evaluate a standardized PTSD Risk strategy protocol for admitted trauma patients at a Northern California Level II Trauma Center. There are three specific aims:

4. By October 2022, participants in the educational intervention (NPs, PAs, and social workers) will have gained at least 20% more knowledge of the PTSD screening strategy, as evidenced by pre-and post-assessment surveys.
5. By March 2023, at least 80% of traumatically injured patients will receive PTSD risk screening and trauma-informed care education before being discharged.
6. By June 2023, mental health referrals will be provided to at least 80% of patients in the high-risk category for PTSD development.

4. Brief Description of Intervention (150 words):

Develop and implement a PTSD risk screening strategy to assess the risk and deliver brief interventions to at-risk patients to help avoid or mitigate the severity of PTSD. A two-hour evidence-based education module that includes PTSD risk factors, coping mechanisms, and the established screening process will be developed to train staff to implement the PTSD risk screening and intervention protocol. Patients will be screened by the SW using a validated PTSD risk predictor screening tool at the bedside during their admission. Patients will be stratified into a low, moderate, or high-risk category for the development of PTSD. An intervention algorithm will used by the advance practice provider to guide a stepped intervention approach according to risk. A brief bedside intervention, regardless of the patients PTSD score, will be provided to all patients that includes education about coping strategies and mental health recovery (trauma-informed care). Patients that score a moderate risk will be scheduled for an outpatient telephone encounter with a trauma case manager at 30-45 days post injury for a PTSD screening follow-up. And finally, all high-risk patients will be given a direct referral for a comprehensive psychiatric outpatient mental health assessment upon discharge.

4a. How will this intervention be implemented?

A PTSD risk screening tool kit will be implemented at a Level II Trauma Center to be used on all admitted trauma patients. The implementation process includes the following steps:

- Selection of a validated PTSD risk screening tool
- Develop a PTSD screening process flow map
- Design a PTSD intervention algorithm
- Develop education module for staff training
- Develop pre- and post-knowledge survey according to the evidence-based education module
- Provide education and training to the staff
- Develop a script for screening

A communication plan will be developed that identifies the stakeholders for the project. The stakeholders include the CNE, trauma surgeons, trauma physician assistant/nurse practitioner, social workers, nursing, and mental health providers. Information will go out in several ways that include verbal communication, emails, flyers, graphic display, and visual management boards.

5. Outcome measurements: How will you know that a change is an improvement?

As part of the trauma program, the current organization already enters all trauma patients into a licensed trauma registry that is used to track and trend data and submit to a National Trauma Data Base. This program meets HIPPA standards and can run reports with no patient identifiers. The means to measure the change in improvement is indicated below each specific aim:

1. By October 2022, participants in the educational intervention (NPs, PAs, and social workers) will have gained at least 20% more knowledge of the PTSD screening strategy, as evidenced by pre-and post-assessment surveys.
    a. Staff knowledge of PTSD risk screening process and coping mechanisms related to a traumatic injury expressed as a percent improvement of scores on a de novo survey of evidence-based content assessed pre- to post-education.
        - The degree of knowledge improvement of the PTSD risk screening and intervention protocol will be assessed by comparing scores on a survey given immediately before and after the educational intervention.

2. By March 2023, at least 80% of traumatically injured patients will receive PTSD risk screening and trauma-informed care education before being discharged.
    a. PTSD risk screening and trauma-informed education provided to traumatically injured patients as indicated by PTSD Performance Improvement Indicator data points.
        - Patient PTSD risk screening scores to determine the screening compliance rate will be tracked in Trauma One as PTSD Performance Improvement Indicator data points indicating low, moderate, or high risk or not completed.

3. By June 2023, mental health referrals will be provided to at least 80% of patients in the high-risk category for PTSD development.
    a. Mental health referral of patients at high-risk for PTSD as indicated by audit filter data points.
        - Mental health referrals will be tracked as an audit filter data point for each high-risk patient to determine the referral adherence rate.

References

American College of Surgeons. (2018). *Statement on post-traumatic stress disorder in adults.*

https://www.facs.org/about-acs/statements/109-adult-ptsd

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

DNP Statement of Determination
Evidence-Based Change of Practice Project Checklist Outcome

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749/A/E

☒ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). **Student may proceed with implementation.**

☐ This project involves research with human subjects and **must be submitted for IRB approval before project activity can commence.**

Comments:

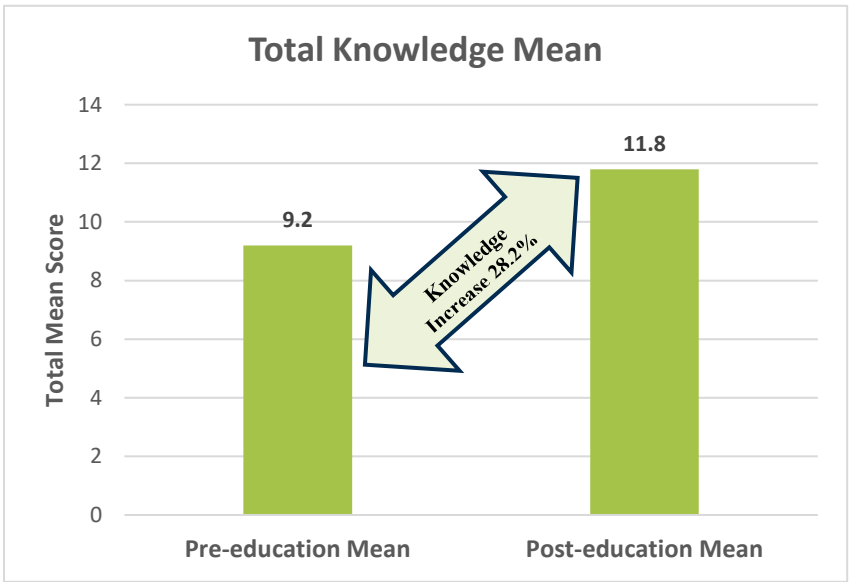
Student Last Name:	McGahey	**Student First Name:**	Christine
Student Signature:	Christine McGahey	**Date:**	9/7/22
Chairperson Name:	Francine Serafin-Dickson		
Chairperson Signature:	Francine Serafin-Dickson	**Date:**	9/7/22
Second Reader Name:	Elena Capella		
Second Reader Signature:	Elena Capella	**Date:**	10/23/22
DNP SOD Review Committee Member Name:	Francine Serafin-Dickson	**Date:**	9/7/22
DNP SOD Review Committee Member Signature:	Elena Capella	**Date:**	10/23/22

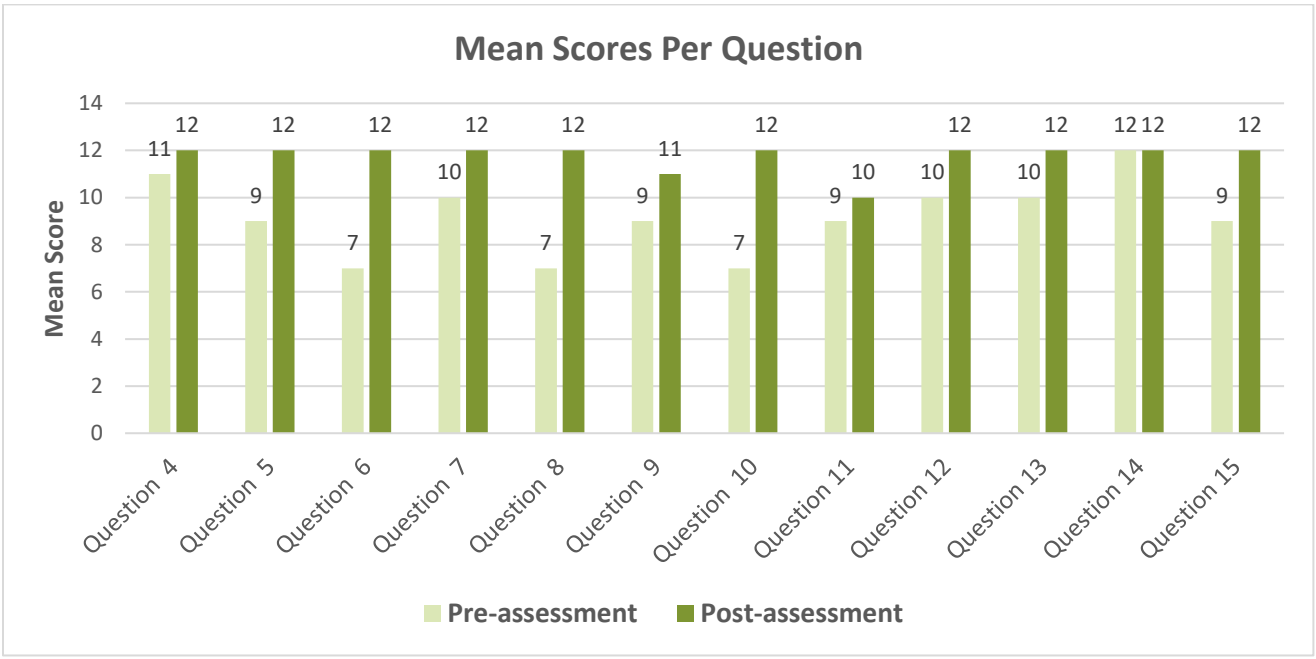
Appendix P

Outcome Measure – Knowledge Improvement
Pre – Post Staff Education Data

Demographic Data Survey		
Educational Attainment-Question 1		
Level of Education	Number of Participants Out of 21	Percent
Master's Level	21	100%
Professional Role Distribution-Question 2		
Role	Number of Participants Out of 21	Percent
Social Worker	17	80%
Social Worker Manager	1	5%
Advanced Practice Provider (APP)	2	10%
Case Manager (PCC)	1	5%
Years of Professional Experience-Question 3		
Number of Years	Number of Participants Out of 21	Percent
≤ 2 years	6	29%
3-5 years	4	19%
6-10 years	7	33%
11-15 years	3	14%
≥ 16 years	1	5%

Education Knowledge Survey			
Q#	Question	Pre-assessment Mean	Post-assessment Mean
4	PTSD can be diagnosed at which time frame?	11	12
5	What factor is considered one of the most influential determinants affecting the post-injury quality of life for trauma survivors?	9	12
6	When implementing the Injured Trauma Survivor Screen (ITSS) tool in trauma care, what is its primary purpose?	7	12
7	Which of the following are not a contributing factor to consider when evaluating for risk of PTSD?	10	12
8	Which PTSD risk score indicates high risk for PTSD development using the ITSS?	7	12
9	Which of the following has the potential to mitigate the severity of PTSD before the development of chronic or delayed PTSD?	9	11
10	What is the primary and essential action that should be taken when a patient has been identified as high-risk for PTSD development?	7	12
11	Within the context of trauma-informed care, what does the "Four R's" framework primarily aim to achieve	9	10
12	What is the approximate percentage of injured patients who experience life-threatening injuries subsequently develop PTSD following their injury?	10	12
13	When conducting a PTSD risk screening using trauma-informed care, what is a key principle healthcare professionals should adhere to in order to avoid re-traumatizing a victim?	10	12
14	What is the primary distinction between PTSD and Acute Stress Disorder?	12	12
15	Which of the following symptoms are commonly associated with PTSD?	9	12
	Total Mean Score	**9.2**	**11.8**
	Knowledge Increase	**28.2%**	

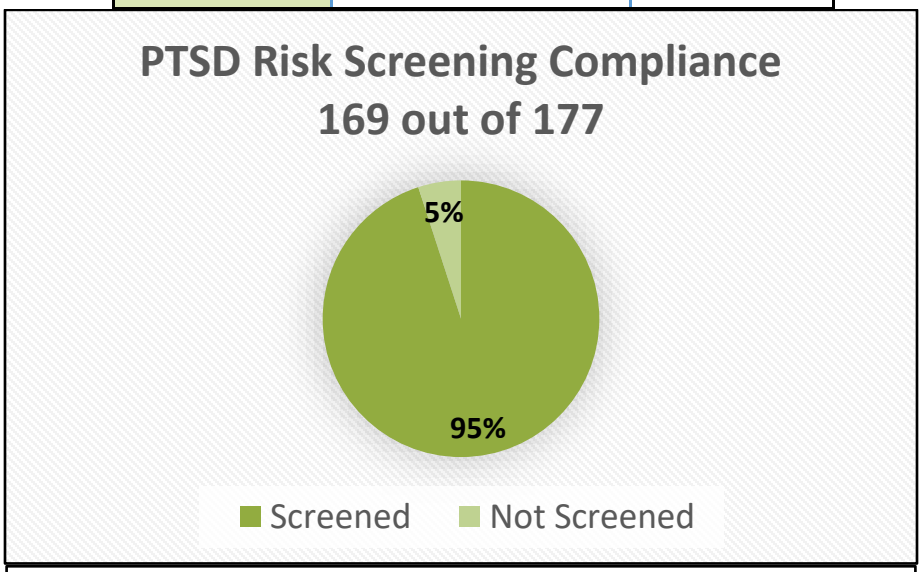

Total Knowledge Mean
Total Mean Score
14
12
10
8
6
4
2
0
9.2
11.8
Knowledge Increase 28.2%
Pre-education Mean
Post-education Mean

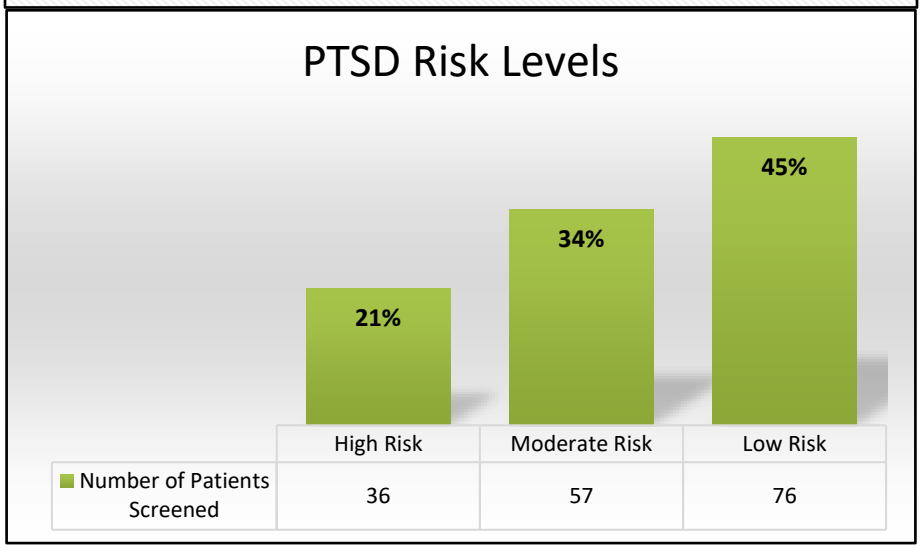

Mean Scores Per Question
Mean Score
14
12
10
8
6
4
2
0
11 12
9 12
7 12
10 12
7 12
9 11
7 12
9 10
10 12
10 12
12 12
9 12
Question 4
Question 5
Question 6
Question 7
Question 8
Question 9
Question 10
Question 11
Question 12
Question 13
Question 14
Question 15
Pre-assessment
Post-assessment

Appendix Q

Outcome Measure - PTSD Risk Screening

Total Trauma Patients: 177	Performance Improvement Indicator	Number of Patients
	High Risk	36
	Moderate Risk	57
	Low Risk	76
	Total Patients Screened	169
	PTSD Risk – Not Documented	8





Appendix R

Outcome Measure – High-Risk Mental Health Referral

Number of High-Risk Patients	Mental Health Referral – Yes	Mental Health Referral – No
36	34	2