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Mental Health Screening After Trauma: A Concise Review

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DNP Qualifying Manuscript

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Mental Health Screening After Trauma: A Concise Review

ABSTRACT

OBJECTIVE: To gain a better understanding of the value of mental health screening for PTSD risk in hospitalized trauma survivors.

DATA SOURCES: Studies were pooled from a literature search performed on the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and the Cochrane Database of Systematic Reviews.

STUDY SELECTION: Relevant studies published between 2015 and 2022 in English, excluding traumatic injuries incurred during combat.

DATA EXTRACTION: Ten articles were selected for inclusion in this review.

DATA SYNTHESIS: There is a significant and widespread mental health burden following traumatic injury. Early screening to quantify the risk for PTSD can guide interventions to mitigate PTSD development for a trauma survivor. Failure to screen for mental health issues after an injury may leave many individuals at risk of developing PTSD without the required care.

CONCLUSION: The literature reviewed supports the need to protect mental health sequelae after traumatic injury. Mitigating sequelae was shown to be feasible with the adoption of a standardized PTSD risk screening process in trauma centers.

Keywords: early intervention, post-traumatic stress disorder, PTSD, trauma, trauma center, trauma patient, traumatic injury

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BACKGROUND

Every year, millions of Americans are hospitalized in a trauma center following a traumatic injury. Trauma is a public health concern and one of the leading causes of death and disability (Centers for Disease Control and Prevention [CDC], 2021). The impact of a traumatic injury is not limited to the physical body. Mental health, including cognitive and emotional reactions, may also be affected. Exposure to traumatic events can result in acute stress and post-traumatic stress disorder (PTSD) long after the physical injuries have healed (Manser et al., 2018). Approximately 30% of patients who suffer a life-threatening injury experience at least one PTSD symptom within six months of injury (National Center for PTSD, 2022). 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.

A significant body of literature suggests that early screening to quantify the risk for PTSD can direct the focus of early interventions to those highest at risk and may help prevent the development of the disorder. Unfortunately, patients admitted to trauma centers are rarely evaluated for PTSD risk or educated about its long-term repercussions. In the current state of focusing solely on the immediate injury, the mental health aspect of patient care is overlooked. This unrecognized vulnerability to psychological maladjustment following a physical injury can contribute to the development of severe and long-lasting mental health impairments. Reflecting on a growing awareness of the need to manage mental health concerns after trauma, the American College of Surgeons (ACS) Committee on Trauma has released new standards for

2023 requiring trauma centers to conduct mental health screening to target at-risk patients (ACS, 2022).

OBJECTIVE

This concise review aims to gain a better understanding of the value of mental health screening for PTSD risk in hospitalized trauma survivors.

METHODS

Search Strategy and Eligibility Criteria

A comprehensive assessment of trustworthy sources published within the last seven years served as the foundation to understand the prevalence and severity of PTSD and examine the evidence to support 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. The exclusion criterion was traumatic injuries incurred during combat. Of 182 articles returned in the initial search, 84 were duplicates, and 79 were excluded. The search yielded 19 articles retained for further review, 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.

Study Selection

Abstracts, keywords, and content of all 21 articles were reviewed to determine relevance. Eleven studies were excluded as the content did not address the objective, or the studies were conducted solely on pediatric patients or not conducted in trauma centers. The search tactics used limited the volume of PTSD risk strategies research to keep the scope focused on mental health recovery after a traumatic injury. Ten studies were chosen and synthesized in this review. A summary of the studies used in the review is presented in Table 1.

RESULTS

Three major themes emerged from the review in selecting and reviewing the ten articles: (1) a relationship between physical injury and mental health; (2) early screening to quantify PTSD risk is a valuable predictor of maladaptive outcomes after injury; and (3) 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, 2022). Exposure to traumatic injury 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). The 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. 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 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 trauma due to its direct and significant impact on the body and inherent abilities, influencing resilience as a consequence (Kampman et al., 2015).

Through evidence presented in a systematic meta-analysis, Dai and colleagues (2018) aimed to determine the pooled prevalence of acute stress disorder and PTSD among traffic accident survivors. 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, 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 types of 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 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 mega-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, including 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 secondary education and exposure to prior interpersonal trauma had a 34% higher risk compared to participants without those risk factors. Shalev et al.'s (2019) 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; deRoos-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 (deRoos-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 (deRoos-Cassini et al., 2019; Manser et al., 2018; Nehra et al., 2019). Hunt et al. (2017) performed a 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% and a specificity of 93.94%, the study demonstrated that the brief ITSS tool could 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 deRoos-Cassini et al. (2019). Based on the 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 (deRoos-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 mentally or emotionally cope with or recover from a significant crisis threatening a trauma survivor's life or functional status. 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 findings, the authors concluded that screening could help identify individuals with a low threshold and use it 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; deRoos-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 deRoos-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, deRoos-Cassini et al. (2019) and Hunt et al. (2017) showed the stepped intervention approach to be 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. deRoos-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).

DISCUSSION

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

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 literature review of evidence demonstrated a significant and widespread mental health burden following traumatic injury. Early screening to quantify the risk for PTSD can guide interventions to mitigate PTSD development after injury. Given the complexity of the relationship between traumatic physical injury and mental health, targeting high-risk patients is essential to reduce the PTSD burden and improve a patient's overall outcomes.

Existing evidence suggests that preventing mental health sequelae after traumatic injury is feasible with the adoption of a standardized PTSD risk screening process for hospitalized trauma survivors. The use of a PTSD risk screening tool can help trauma providers identify risk factors and start psychological first aid at the bedside when needed. Furthermore, by quantifying the risk of developing PTSD, we can contribute to preventing serious health problems in the

future for trauma survivors. This may have significant implications for clinical practice and should create a precedent for professionals to screen patients following injury.

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KEY POINTS

- Debilitating mental health sequelae after traumatic injury is a public health concern that deserves more attention, yet admitted trauma survivors are rarely screened for or educated about the devastating effects of PTSD following injury.
- Failure to screen for mental health issues after a traumatic injury may leave many individuals at risk for developing PTSD without the care they require.
- Preventing mental health sequelae after a traumatic injury is feasible with adoption of a standardized PTSD risk screening process in all trauma centers.

TABLE 1

Summary of Studies Used in the Concise Review

Reference	Aim or Purpose	Methodology	Sample/Setting	Outcome and Importance of Study
Dai et al., 2018	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	<ul style="list-style-type: none"> • 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
deRoos-Cassini et al., 2019	Assess the current state of the literature on evidence-based screening tools for PTSD risk in hospitalized trauma patients	Literature review	6 literature reviews for screening for PTSD and 5 literature reviews for early PTSD interventions were performed Three symptoms' screenings, two risk factor screenings, and one automated EMR screening were reviewed	<ul style="list-style-type: none"> • 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
Hunt et al., 2017	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	<ul style="list-style-type: none"> • 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 • stepped intervention approach to treatment interventions occurring within the first four weeks of injury yielded the most significant effects
Kampman et al., 2015	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	13 qualitative articles were synthesized related to PTG 10 semi- structured and 3 mixed methodologies	<ul style="list-style-type: none"> • 4 interrelated themes: 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

Manser et al., 2018	Determine the feasibility and effectiveness of a PTSD screening and brief intervention with patients hospitalized at a Level I trauma center after injury	Prospective randomized controlled trial	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 but only 140 agreed to enroll in the study	<ul style="list-style-type: none"> 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
Nehra et al., 2019	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	<ul style="list-style-type: none"> Results showed that 204 (67%) of the participants were classified as having low resilience, and their long-term outcomes were consistently lower 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
Ravn et al., 2020	Investigate the potential relationship between PTSD and pain from whiplash after a motor vehicle accident (MVA)	Qualitative explorative study	8 participants from Denmark Germany area from multiple hospitals	<ul style="list-style-type: none"> 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 symptom connections, notably those between pain and post-traumatic stress disorder
Shalev et al., 2019	Determine the probability of meeting PTSD diagnostic criteria after an acute care admission for a traumatic injury	Mega-analysis study	13 longitudinal acute care-based studies in 6 countries with 2473 participants	<ul style="list-style-type: none"> 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
Stein et al., 2019	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	<ul style="list-style-type: none"> 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,

Visser et al., 2017	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	<p>2.09-6.09), and was injured in an assault or violent occurrence (adjusted odds ratio, 3.43; 95% CI, 1.56-7.54)</p> <ul style="list-style-type: none"> • Patients that have mental health issues prior to injury are at a higher risk to develop PTSD • High risk patients should get surveillance and interventions early • 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
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Abbreviations:

Acute stress disorder (ASD)
Comparative fit index (CFI)
Electronic Medical Record (EMR)
Emergency Department (ED)
Injured Trauma Survivor Screen (ITSS)
Major depression diagnosis (MDD)
Motor vehicle accident (MVA)
Post-traumatic growth (PTG)
Post-traumatic stress disorder (PTSD)
Traumatic brain Injury (TBI)