

Implementation of Trauma Survivors Screen to Improve Utilization of Trauma Survivors

Network

by

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Abstract

Problem & Purpose: At a large, level-one trauma center, there is a lack of screening for post-traumatic stress disorder (PTSD) and depression among the adult trauma population. Routine screening for PTSD/Depression risk among this patient population is recommended by national professional organizations, due to the significant impact they can have on long-term outcomes. The purpose of this quality improvement project was to educate trauma nursing staff on the importance of screening patients for PTSD/Depression, implement the Injured Trauma Survivors Screen (ITSS) into the routine care of traumatically injured patients, and increase patient education on the available support network program present within the organization. **Methods:** Data was tracked and analyzed through de-identified HIPPA compliant excel spreadsheets. Measures tracked throughout implementation were the following: nursing staff that received education on ITSS and support network, patients screened using the ITSS, patients identified as being “at-risk” through scoring of the ITSS, and patients educated on the available support network. **Results:** More trauma patients were screened for PTSD/Depression risk and educated on the support network compared to baseline data. Trends in the data analyzed showed a positive correlation between patients screened with the ITSS (9.6%, 6/62 eligible) and patients educated on the support network (46%, 29/62 eligible). **Conclusions:** Numerous barriers/limitations were encountered, emphasizing the need for the continuation of educating staff and patients on the incidence, and potential implications, of the development of PTSD/Depression in this already vulnerable population. Efforts should continue to address the mental health of trauma patients, working to decrease the incidence of PTSD/Depression and improve the trauma survivors’ resiliency and long-term outcomes.

Implementation of Trauma Survivors Screen to Improve Utilization of Trauma Survivors Network

Traumatic injury remains one of the leading causes of premature death and disability in the United States (U.S.), accounting for 246,041 deaths (CDC, 2021a) and an estimated 2,835,496 hospitalizations (CDC, 2021b) annually. The American College of Surgeons Committee on Trauma (ACS-COT) estimates up to 40% of injured trauma survivors in the U.S. experience high levels of (PTSD) and/or depressive symptoms following their injury, prompting them to recommend trauma centers implement screening for PTSD/depression into routine care of trauma patients (ACS-COT, 2018). Early identification of psychological symptoms and intervention through provision of resources and support can reduce the psychological sequelae of traumatic injuries, improving survivors' outcomes (Major Extremity Trauma Rehabilitation Consortium [METRC], 2019). The Trauma Survivors Network (TSN) is a patient-oriented program, modeled on evidence-based interventions, designed to address the psychological sequelae of trauma to improve post-trauma outcomes for survivors (METRC, 2019; TSN, n.d.). At a large, mid-Atlantic, level-one trauma center, TSN is available to all trauma survivors; however, there has been considerable variability in the patient education and utilization of the program. The current process (Appendix A) lacks a PTSD/Depression risk screening protocol that could be used to identify patients at risk and those that could benefit from the support network. Considering the vulnerability and health disparities already present among many trauma patients, failing to screen for PTSD/Depression risk and connecting them to support resources places them at higher risk of poor outcomes and recovery.

Purpose statement: The purpose of this quality improvement project was to implement and evaluate the effectiveness of a PTSD/ depression risk screening tool for adult trauma patients.

Evidence Review

The need for PTSD and depression risk screening among the trauma population is the focus of this evidence review. The review will begin with evidence supporting the use of screening tool(s) to identify trauma survivors at risk for PTSD and/or depression. This will be followed by review of the effectiveness of screening tools in this population. Finally, the review will conclude with review of evidence regarding the role screening has in connecting survivors with support services.

Due to the strong relationship that has been demonstrated between development of PTSD and/or depression and long-term functional impairments, ACS-COT (2014), the professional organization that develops clinical guidelines, recommends that all trauma centers implement routine screening for all trauma patients. Evidence suggests that absence of screening trauma patients places them at greater risk for unaddressed PTSD and/or depression risk factors, resulting in poor long-term outcomes including, decreased health related quality of life (HRQoL), poor functional outcomes, and prolonged disability (deRoon-Cassini et al, 2019; Menses et al., 2020). There are numerous screening tools available for screening this patient population; however, evidence from literature indicates the ITSS is a simple yes/no nine-item tool, created specifically for use in the adult traumatically injured inpatient population with adequate sensitivity and specificity (deRoon-Cassini et al, 2019; Hunt et al., 2016; Menses et al., 2020). Routine screening can result in early identification of risk factors, allowing for early intervention to prevent development of PTSD and/or depression (ACS-COT, 2014; deRoon-Cassini et al, 2019; Hunt et al., 2016; Menses et al., 2020; Zatzick et al., 2013). Implementing screening for all trauma patients lessens the likelihood that patients will be discharged from the hospital without being educated on the risks of psychosocial sequelae of trauma or how to access

available resources to support them through their recovery (deRoon-Cassini et al, 2019; Menses et al., 2020; Zatzick et al., 2013). Although the literature reviewed all support the implementation of screening, there are some differences among the evidence. Hunt et al. (2016) specifically focuses on the implementation of ITSS in the trauma patient and the evidence of utility and ability to identify PTSD/depression risk. ACS-COT (2014), deRoon-Cassini et al. (2016), and Menses et al. (2020) conclude that implementation of one of the various validated screening tools can have a positive impact on care of the trauma patient. These studies do not focus on one particular tool, rather suggests implementation of a tool that is feasible in the setting, appropriate for the patient population, and fits into the organization's budget. Zatzick et al. (2013) concluded that implementation of a stepped care approach, in addition to a screening tool, can have the greatest impact on patient outcomes.

The evidence review included one randomized control trial (RCT), one quasi-experimental study, two literature reviews, and one professional organization's clinical practice guidelines. The Johns Hopkins' Nursing Evidence Based Practice Evidence Level and Quality Guide (2017) was used to grade the strength and quality of evidence. Evidence Review of the evidence supported implementation of PTSD/depression risk screening into the routine care of all adult trauma patients. Evidence indicates that early identification of present risk factors allows for early intervention to prevent the development of these psychological disorders. Early intervention included connecting trauma patients to available support networks, such as TSN, to build their resilience and facilitate their recovery. Providing trauma patients with education and access to available resources can prevent development of psychosocial sequelae, improving their long-term outcomes and quality of life.

Theoretical Framework

Albert Bandura's Self-Efficacy Theory (SET), a middle range theory, has been selected to serve in the understanding of the practice problem of interest (Figure 1). Self-Efficacy is defined by Bandura (1994) as a person's belief about their capability to influence and produce desired effects in their life, which determines how the person feels, thinks, motivates self and behaves. A high level of self-efficacy enhances personal accomplishment and well-being, enabling one to approach difficult tasks, quickly recover from failures or setbacks, and approach challenges rather than display avoidance and fear (Bandura, 1994). SET is focused on behavior change to increase self-efficacy through the following sources: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal (Bandura, 1977), all of which are incorporated in the TSN services. If low self-efficacy, negative emotions and maladaptive responses are not identified early and managed with appropriate interventions, they may result in development of PTSD and/or depression (Wegener et al., 2017). Implementation of the screening tool for PTSD and depression symptoms was used to educate and connect patients with TSN, a program developed with the goal of increasing trauma survivors' self-efficacy, support network and self-management skills (Wegener et al., 2017).

The Framework for Complex Innovations, a process framework, described by Helfrich et al. (2017) was applied to the implementation plan for this quality improvement project (Figure 2). Constructs of the framework was used to support the implementation and success of the project. Management approval was obtained to provide support and communicate with the unit staff the rationale and importance of the quality improvement project, no financial resources were identified or necessary, so focus was placed on other areas. Organizational practices and policies were reviewed to identify and address potential barriers to implementation, such as no

formal policy regarding screening/referral to TSN despite ACS-COT recommendations. The organization in which the project took place, values evidence-based practices and providing patients with care that will address their overall well-being, this helped support buy-in and created a climate in which quality improvement projects were valued and their importance understood. The effectiveness of implementation was measured and reviewed during the process to evaluate consistency and quality of the screening tool.

Methods

The setting in which this clinical practice change took place is a 12-bed multi-Trauma intermediate care unit (IMC) within a level one trauma center in the Mid-Atlantic region. The IMC provides care primarily for adult patients admitted for traumatic injuries. The patient population was diverse, including patients of many different races, cultural beliefs/practices, and socioeconomic status (SES). To ensure that no population was excluded, the screening tool and TSN education was offered to all patients admitted to the unit for traumatic injury. For patients that English is not their preferred language, translators were available via the “blue-phone” or translator tablet. The nurse administering the screening or delivering education could access the translator to ensure non-English speaking patients were included. They were presented with information regarding the screening tool and could decline if they did not want to participate. It was important that patients consented to participating in the screening as it asked personal questions regarding a sensitive topic. Through allowing patients to be in control of this decision, it facilitated trust and the building of a relationship with health care providers. Accessing TSN resources does not have monetary cost for patients, which allowed even those of low SES or uninsured to utilize the program.

Implementation of the ITSS and TSN education on the IMC required participation and buy-in from numerous stakeholders. Stakeholders included organization's administrators, nursing director, unit management, unit nursing leaders, and TSN staff. Buy-in and routine engagement with stakeholders was required for planning and implementation of the intervention. Prior to implementation, potential barriers and facilitators were identified as well as the unit's workflow. Assessing these factors allowed the intervention to be tailored to fit this particular unit's workflow and needs. The ITSS was utilized as the PTSD/depression risk screening tool (Appendix B). Education on TSN was provided using educational resources from the program and staff.

During the implementation, the progress and impact of the practice change was measured. Structure, process, and outcomes were measured through collection of data from the Charge Nurse Reporting Sheet (Figure 4), observations, and staff interviews. Data was then analyzed using Excel run charts. The structure goal measured was nursing staff education on the ITSS and TSN resources. Nursing staff education was initiated prior to implementation and continued into the implementation period. The process and outcome goals measured were percentage of eligible patients screened using the ITSS, percentage of patients educated on TSN, and percentage of patients connected/referred to TSN. Various strategies and tactics were utilized to assist in accomplishing structure, process, and outcome goals (Table 3).

Data collection was conducted using the Charge Nurse Reporting Sheet. Data collected from the report sheet was transferred to an Excel spreadsheet for further management and analysis. To protect human subjects, all data was recorded on a secure data management spreadsheet, stored on a password-protected device only accessible by the Quality-Improvement Project Lead (QI-PL). The data recorded on the spreadsheet has all patient and staff information

de-identified. Run charts were created for each structure, process, and outcome measure using the data collected in the spreadsheet. Data analysis was conducted using the information provided by each run sheet to determine implementation progress and goal achievement. During data analysis, the structure goal was met, having 100% of nurses educated on ITSS and TSN. Analysis showed that the process and outcome measure had a positive correlation, with both the ITSS and TSN Education measurements increasing and decreasing at similar data collection points. Although they experienced a trend of increased percentages, each measure then experienced a decline below the established median value.

Results

During the first three weeks of the QI project implementation phase, 100% (28/28) of the nurses on the IMC were educated on the ITSS and TSN. Over the course of the 12-week implementation phase, an average of 9.6% (six of the total 62) of eligible patients were screened for PTSD/Depression risk using the ITSS. The greatest percent of eligible patients screened occurred during the seventh week, having 33% (two out of six) of eligible patients screened. There were six weeks where 0% of patients were screened using the ITSS. During the same 12-week period, an average of 18.8% (12 out of 62) of eligible patients were educated on the TSN. The greatest percent of patients educated on TSN occurred during the sixth week, with 46% (five out of eleven) of patients educated. There was one week during the implementation phase where 0% of patients were educated on TSN. Data was analyzed and a run chart (Figure 3) was created to illustrate the results of patients screened with the ITSS and patients educated on TSN.

As illustrated on the run chart (Figure 3), observation of results shows an association among the percent of patients screened using the ITSS and educated on TSN. Both measures follow similar trends, with both having the highest percentage of patients during weeks six

through ten. When more patients were screened with the ITSS, more patients were also educated on the TSN. The percentage of patients screened using the ITSS did have a much lower average (9.6%, 6/62) compared to those educated on TSN (46%, 29/62). There were also six weeks where no patients were screened; however, there was only one week during which no patients were educated on TSN. The association seen among these results may indicate that screening and educating patients are correlated. Further investigation would be required to determine the causation and relationship between these two measures.

Even though there is an observed association among ITSS screening and TSN education, there could be numerous reasons why these two measures had similar patterns. The highest percentage of patients educated, and patients screened occurred during the same weeks, which could indicate that screening patients prompted more education on TSN. During this period, there was also increased presence of the QI project lead and unit champions on the unit. The increased presence could have been the cause of increased engagement during these weeks, as staff often felt more active in the process during this time.

Based on analysis of the collected data, neither the process nor outcomes measures met their goals. Strategies and tactics utilized to achieve goals were evaluated throughout the implementation process (Table 4). Some strategies and tactics were adjusted based on the preliminary data and barriers/facilitators encountered using the Consolidated Framework for Implementation Research (CIFR) (Table 5). Analysis of the data and barriers/facilitators encountered allowed further identification of areas of improvement and provides valuable information for similar quality-improvement projects in the future.

There were numerous barriers and facilitators encountered during the implementation of the QI project. The IMC on which the project took place had many high-acuity patients, which

resulted in the nursing staff often being busy with a high workload. This presented a challenge when trying to actively educate and engage the nursing staff with the project, as they had many competing responsibilities which, understandably, demanded their time and attention. Although many expressed interests, it was often challenging for them to actively participate in the project. Project implementation took place during the COVID-19 pandemic, during which many health care settings were experiencing nursing staff shortages. The IMC on which the project took place was no exception, having high nursing staff shortages created another barrier to implementation. There were also many nurses that had new hire orientees or students with them, meaning they had even more tasks and responsibilities to focus on and less time to engage in the practice change. The ability to have two nursing champions on the unit facilitated the implementation, as they were frequently engaging with the staff and promoting implementation of the screening and education. After six weeks, one nursing champion did resign from the setting, leaving on nursing champion to continue to actively engage staff and communicate.

Discussion

Although the outcome goals of 100% of patients screened using the ITSS and 100% of patients educated on TSN were not achieved, the observed outcomes of this QI project are still important and can have a greater impact on future practice. Results show that during the QI project implementation, more patients were screened for PTSD/Depression risk and educated on TSN compared to baseline. Prior to implementation, baseline data indicated that patient education regarding the TSN was very limited. PTSD/Depression risk screening was not performed prior to implementation as routine care was without any screening protocol or recommendations. Another key finding was related to nurse education on TSN and ITSS, including the importance of identifying PTSD/Depression risk(s) and the long-term impact these

can have on patients. Not all nurses on the unit were familiar with the TSN even though it has been an established program within the organization. Most nurses reported that they had briefly heard about the program but were not completely aware of the resources it provided to patients. Many also reported that they knew trauma patients were at risk for PTSD and or depression but did not fully understand the long-term consequences they could have on patient outcomes. As there was lack of screening in place, nurses were not familiar with screening tools specific to PTSD/depression risk. Educating the nursing staff was essential to gaining buy-in and engagement with the project.

Results are consistent with findings of other publications regarding implementation of similar intervention(s) for trauma survivors. Many publications discuss the challenges of successfully implementing practice changes to address PTSD/Depression risk among this vulnerable population. Although the TSN is an established program available at many trauma centers throughout the nation, many publications still show that there is considerable variability in the utilization of the service. Common barriers discussed that were also encountered during the QI project implementation are lack of time to conduct activities, concerns about engaging trauma patients about PTSD/depression, limited communication, and limited organization commitment/protocols. Understanding the impact these barriers have on implementation and how to appropriately address them may be vital to the success of future practice changes to improve the care and long-term outcomes of trauma survivors.

Conclusion

Based on observation of the results achieved, barriers encountered, and the facilitators of the practice change, sustainability is challenged. As encountered during the implementation phase, high presence of a unit champion or QI project lead was essential to achieving higher

percentage of engagement. Without frequent presence on the unit, the sustainability is challenged as there will be less reminders, decreased engagement, and less frequent discussions on the important implications of practice change. The project did initiate conversations regarding the need for PTSD/Depression screening and TSN education, with strong emphasis on the major long-term patient outcomes that could result from practice change. Sustainability is possible if they continue to recognize the high-risk trauma survivors are at and the major impact the practice change can have. The TSN is already established at the organization, there just needs to be increased engagement between the TSN and not only unit nurses, but all health care providers involved in the care of the trauma patient.

There are many implications for future practice including the need for collaboration among the multi-disciplinary care team involved in the trauma patients care. Members of the team need to work together to ensure that trauma patients' psychological needs are met, including ensuring they are appropriately screening for PTSD/Depression risk(s) and providing patients with access to support networks, such as the TSN. Providers should also take the opportunity during trauma patient's outpatient visits to assess any psychological needs or presence of PTSD/Depression risks, or at this time, symptoms. TSN can be accessed at any time, so trauma patients need to be educated on this, ensuring they are aware that their care and attention to their mental health does not end with their discharge from the hospital. With continued conversations and acknowledging the trauma survivor's mental health, sustainability is possible as is improved long-term outcomes of trauma survivors.

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Table 1
Evidence Review

Citation: American College of Surgeons Committee on Trauma. (2014). <i>Resources for the Optimal Care of the Injured Patient</i> . https://www.facs.org/-/media/files/quality-programs/trauma/vrc-resources/resources-for-optimal-care.ashx					Level IV (B)
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“Committee on Trauma’s Resources document provides the guidelines used by the ACS Verification/Consultation Program to evaluate trauma centers. It outlines the essential and desirable requirements for trauma centers pursuing consultation or seeking to gain or maintain verification by the ACS COT.”	Expert committee with special focus on delivery of care in trauma centers within the United States review and evaluate relevant studies, using findings to develop guidelines that assist in improving care of injured patients.		Early screening for PTSD and depression in injured trauma survivors.	Dependent Variable: PTSD and related co-morbid depression following traumatic injury.	Early screening and intervention for PTSD and depression have potential to improve symptomatic and functional outcomes of traumatic injury survivors. Recommends routine screening for PTSD and depression at trauma centers.
Citation: Deroon-Cassini, T. A., 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. (2019). Screening and treating hospitalized trauma survivors for posttraumatic stress disorder and depression. <i>Journal of Trauma and Acute Care Surgery</i> , 87(2), 440–450. https://doi.org/10.1097/TA.0000000000002370					Level V (B)
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“The purpose of this review is: (1) to evaluate the current state of the literature regarding evidence-based screens for PTSD and depression in the hospitalized trauma patient and (2) summarize the literature to date regarding the treatments that have empirical support in treating	Literature review conducted by panel of authors specialized in clinical psychology with focus on injured trauma survivors.	Literature review was conducted evaluating current literature regarding evidence-based screens for PTSD and depression in the hospitalized trauma patient population. Literature on the treatment of PTSD and depression in this population was also	Interventions in the studies included six in-person screens available for PTSD and/or depression in hospitalized trauma patients. The screens reviewed are: PTSD Checklist for DSM-5 (PCL5), Posttraumatic Adjustment Screen (PAS), Peritraumatic Distress Inventory	Dependent Variable: Researchers selected literature with focus on preventing or providing interventions for PTSD and depression, improving health outcomes, and improving quality of life for traumatic injury survivors.	Through literature review and evaluation, the authors identified six screens available for PTSD and/or depression in hospitalized trauma patients. Each screening tool was evaluated for their sensitivity/specificity in this population,

<p>PTSD and depression acutely after injury.”</p>		<p>reviewed and evaluated.</p>	<p>(PDI), Predictive screening tool for depression and PTSD after injury, Injured Trauma Survivor Screen (ITSS), and Automated EMR screen.</p>		<p>benefits, and limitations. Conclusion: Administering PTSD and/or depression screens to this population is beneficial when there are other strategies/programs in place for patients to access help. Administering screens while patient is still hospitalized has greater completion rates. Trauma centers that implement the ACS-COT screening recommendation should consider their existing resources and patient-specific needs to determine which screening tool would fit their needs.</p>
<p>Citation: Hunt, J. C., Sapp, M., Walker, C., Warren, A. M., Brasel, K., & De Roon-Cassini, T. A. (2017). Utility of the injured trauma survivor screen to predict PTSD and depression during hospital admission. <i>Journal of Trauma and Acute Care Surgery</i>, 82(1), 93–100. https://doi.org/10.1097/TA.0000000000001306</p>					<p>Level II (B)</p>
<p>Purpose/ Hypothesis</p>	<p>Design</p>	<p>Sample</p>	<p>Intervention</p>	<p>Outcomes</p>	<p>Results</p>
<p>“The purpose of the current study was to create a brief self-report screening tool to assess who among adult injured trauma survivors admitted to the hospital are at the most risk for the later development of PTSD and depression.”</p>	<p>Prognostic study</p>	<p>Eligible Participants: Any adult injured trauma survivor admitted for traumatic injury to two Level 1 trauma centers in the United States. Excluded: Individuals younger than 18 years of age, with a Glasgow</p>	<p>The Injured Trauma Survivor Screen (ITSS) was administered to all participants while inpatient. Follow-up was conducted at one month, during which time participants were administered the Clinical Administered</p>	<p>Dependent Variable: The risk and/or the development of PTSD and/or depression one month after traumatic injury. Measure: Injured Trauma Survivor Screen (ITSS) was used to measure</p>	<p>Statistical Analysis: ROC curve analysis was used to determine ITSS’ sensitivity, specificity, NPV, and PPV. Sensitivity (PTSD = 75%, Depression = 75%)</p>

		<p>Coma Scale score <14 on arrival, self-inflicted injuries, inability to communicate, and non-English speaking. Accepted: 276 participants enrolled, 137/276 were lost to one month follow-up. 139 participants completed the assessment.</p>	<p>PTSD Scale for DSM-5 (CAPS-5), the PTSD Checklist for DSM-5 (PCL-5), and the Center for Epidemiological Studies Depression Scale Revised (CESD-R).</p>	<p>risk for developing symptoms of PTSD and depression. The Predictive Screening Tool for Depression and PTSD after Injury was used to measure risk for PTSD and depression. PCL-5 and CAPS-5 was used to measure symptoms of PTSD. CESD-R was used to measure depression. Stepwise bivariate logistic regression was used to determine which items were most strongly associated with presence of PTSD and depression symptoms one most post injury.</p>	<p>Specificity (PTSD = 93.94%, Depression = 95.5%) NPV (PTSD = 90.3%, Depression = 80.8%) PPV (PTSD = 83.3%, Depression = 93.8%)</p> <p>This study provides evidence for the utility of the ITSS as a predictive screen to predict which hospitalized injured trauma survivors are most at risk for developing symptoms of PTSD and depression one month after injury. Use of screen would allow for early identification of individuals and provision of early interventions.</p>
<p>Citation: Meneses, E., Kinslow, K., McKenney, M., & Elkbuli, A. (2020). Post-Traumatic Stress Disorder in Adult and Pediatric Trauma Populations: A Literature Review. <i>Journal of Surgical Research</i>, 0, 1–6. https://doi.org/10.1016/j.jss.2020.09.023</p>					<p>Level V (A)</p>
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
<p>“The purpose of this review is to evaluate the current literature on PTSD in pediatric and adult trauma populations. We seek to identify any current systems in place at trauma centers aimed at tackling this complex condition. We also explore the factors</p>	<p>Literature review conducted by panel of authors specialized in Trauma and Surgery.</p>	<p>Search Strategy: A search was conducted using PubMed and Cochrane databases for studies published from January 2010 through April 2020. Search was conducted for articles with the following keywords: “adult, trauma and</p>	<p>Interventions in the studies included in the review were screening and confirmatory tools for PTSD. These tools include Children PTSD Symptom Scale for DSM-5 (CPSS-5), Children’s PTSD Inventory (CPTSD-I), Injured Trauma</p>	<p>Researchers selected articles outcomes related to risk and/or development of PTSD.</p>	<p>Through the literature review, researchers found that trauma patients are at high risk for development of PTSD. If adequate screening for PTSD is not conducted during hospitalization, patients may go without their risks being</p>

<p>contributing to PTSD development, current evidence-based tools available for PTSD screening, and effective interventions available for managing PTSD symptomatology.”</p>		<p>PTSD”, ”adult, trauma, PTSD, and screening”, “pediatric, trauma, and PTSD”, and “pediatric, trauma, PTSD, and screening.” Two hundred twenty-one studies were initially identified and then screened based on inclusion and exclusion criteria. Eligible Studies: Studies eligible if they investigated PTSD in pediatric or adult trauma population, discussed utilization of screening tool for PTSD, or covered prevention and/or treatment interventions available to trauma patients with comparison across therapeutic options. Excluded: Duplicate articles, articles in non-English languages, short notes, letters, full text unavailable, missing outcomes, and no mention of screening tools or factors affecting PTSD. Included: Twenty studies met inclusion criteria and were included in review.</p>	<p>Survivor Screen (ITSS), PTSD Checklist-5 (PCL-5), Primary Care PTSD (PC-PTSD), and Clinician-Administered PTSD Scale for DSM-5 (CAPS-5).</p>		<p>acknowledged and may be unable to attain necessary interventions for PTSD symptom reduction. Universal screening of all trauma patients using validated screening tool can catch symptoms of PTSD and allow for timely intervention to prevent long-term psychological sequelae of traumatic injuries. Authors recommend implementation of PTSD screening program at all trauma centers, as it is a vital component in the overall recovery of trauma patients.</p>
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		PRISMA: Included with detailed criteria for exclusion and inclusion of studies into literature review.			
Citation: Zatzick, D., Jurkovich, G., Rivara, F. P., Russo, J., Wagner, A., Wang, J., Dunn, C., Lord, S. P., Petrie, M., O’Connor, S. S., & Katon, W. (2013). A randomized stepped care intervention trial targeting posttraumatic stress disorder for surgically hospitalized injury survivors. <i>Annals of Surgery</i> , 257(3), 390–399. https://doi.org/10.1097/SLA.0b013e31826bc313					Level I (B)
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“To test the effectiveness of a stepped care intervention model targeting posttraumatic stress disorder (PTSD) symptoms after injury.”	Experimental Randomized Control Trial, blinded	Sampling Technique: Convenience Eligible Participants: Individuals ages 18 years and older, English-speaking, with traumatic injuries requiring inpatient admission to trauma center. Excluded: Individuals requiring psychiatric intervention, self-inflicted injuries, lived more than 100 miles from the trauma center, currently incarcerated, or had recent histories of severe violence and were likely to face criminal charges. Accepted: 207 patients admitted to trauma center following traumatic injury, who screened positive for PTSD symptoms. Computer-generated random assignment sequence was used to	Control: Usual care control condition Participants in the control group underwent informed consent, PTSD screening, baseline surgical evaluation, and follow-up interviews. Usual post-injury care including routine outpatient surgical follow-up visits, primary care visits, and occasional use of specialty mental health services. Interventions: Stepped Collaborative Care Intervention Participants randomized to intervention group received care from a trauma center based mental health team over the course of 12 months post injury. Care managers coordinated care for	Dependent Variable: Primary outcome of study is presence of PTSD symptoms in traumatic injury survivors. Measure: Two measures were used to assess PTSD symptoms (dependent variable). Clinician-Administered PTSD Scale (CAPS) and the PTSD Checklist Civilian Version (PCL-C). For both measures, higher score indicates greater symptomatic stress. CAPS administered at 1, 6 and 12 month follow-up interviews. PCL-C used to screen injured trauma survivors and to follow-up PTSD longitudinally at 1, 3, 6, 9, and 12 month follow-up points.	Statistical Analysis: There was statistical difference in the outcome. The intervention group demonstrated clinically and statistically significant reduction in symptoms of PTSD over the course of a year post-injury (CAPS $P < 0.01$, PCL-C $P < 0.001$). Intervention patients also demonstrated statistically significant improvements in physical functioning ($P < 0.01$) Patients randomized to the intervention group has significantly more favorable course of PTSD recovery over the 12 months following their injury, as evidenced by reduction in symptom severity.

		<p>place participants in either control or intervention group at a 1:1 ratio. Control: 103 participants Intervention: 104</p>	<p>patient across various settings, attempted to engage and problem-solve each patient's unique post-injury concerns. Participants in the intervention group discussed their preferred treatment preferences with collaborative care team, informing their choice of treatment interventions.</p>		<p>Statistically significant investigative findings can influence development of guidelines for implementation of PTSD screening and intervention procedures at trauma centers.</p>
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Table 2
Evidence Synthesis

Evidence Based Practice Question (PICO): Does conducting PTSD and depression screening for hospitalized traumatic injury survivors connect more trauma survivors to available mental health resources?			
Level of Evidence	# of Studies	Summary of Findings	Overall Quality
I	1	Zatzick et al. (2013) found clinically and statistically significant reduction in PTSD symptoms in the group that received stepped collaborative interventions, including 2-stage PTSD screening procedure, compared to the control group in which participants received the usual care. The intervention group also achieved statistically significant improvements in physical function.	B, randomized control trial with diverse clinical sample. Outcomes of interest measured with the same validated instruments for both the control and intervention groups. Researchers provide consistent recommendations for implementing stepped collaborative care interventions in trauma centers, which are consistent with referenced scientific evidence. Some limitations of the study include not following up with patients that who had initial low PTSD symptom scores and limited information regarding which components of the stepped care procedure were most influential in reducing symptoms and improving function. Study establishes feasibility and effectiveness of the intervention; findings can be used to influence development of guidelines for implementation of PTSD screening and intervention procedures in trauma centers.
II	1	Hunt et al. (2017) provides evidence for the utility of the Injured Trauma Survivor Screen (ITSS) to predict which hospitalized injured trauma survivors are at most risk for development of PTSD and depression symptoms one-month post-injury. In this study, the ITSS performed well and produced strong specificity, sensitivity, NPV, and PPV for both PTSD and depression in this patient population.	B, prognostic study with fairly definitive conclusions. Statistical analysis conducted, results from ITSS measured with other validated screening tools for PTSD and depression among this patient population. ITSS can be used for early screening of hospitalized traumatic injury survivors to identify and connect individuals with appropriate interventions. These recommendations are consistent, and researchers conducted comprehensive literature review to with evidence to support their findings.
IV	1	The American College of Surgeons Committee on Trauma (ACS-COT) (2014) recognizes that traumatic injury survivors are at increased risk for development of PTSD and depression. Research demonstrates that a strong relationship exists between symptoms of PTSD, depression, and functional impairments in this patient population. The ACS-COT recommends that all trauma centers incorporate routine screening for PTSD and depression for all patients. Early screening and referral to available resources have the potential to improve symptomatic and functional patient outcomes.	B, the expert committee has reviewed studies and obtained evidence which supports the committee's recommendation of trauma centers providing the traumatically injured patient population with screening of PTSD and depression. Expertise of the committee is evident. There is moderate certainty that the net benefit is moderate to substantial.

<p>V</p>	<p>2</p>	<p>deRoos-Cassini et al. (2019) literature review found that administering PTSD and/or depression screens to the traumatically injured patient population is beneficial and can connect patients with resources for assistance with mental health. Conducting screens while patient is hospitalized has shown greater completion rates and reduces likelihood of losing patients to follow-ups.</p> <p>Meneses et al. (2020) literature review found that routine screening of all traumatically injured patients for PTSD during hospitalization can identify presence of symptoms and allow for patient to be connected with appropriate intervention(s) in a timely manner. If screening is not conducted, trauma injury survivors may not have their risks acknowledged and may be unable to attain necessary interventions to prevent the long-term psychological sequelae of the trauma they experienced.</p>	<p>B, literature review conducted by panels of authors with expertise in psychology and focused on mental health of injured trauma survivors. Literature review identified six screening tools for PTSD and/or depression, validated for use in this patient population. Strengths and limitations of each study included in review not detailed.</p> <p>A, thorough literature search conducted with appropriate databases. Review included well-defined studies with consistent results among them. Recommendations regarding implementing routine screening for traumatic injury survivors consistent with definitive conclusions. Based on the literature review findings, researchers recommend the implementation of PTSD screening program at all trauma centers as it can have moderate to substantial benefit on trauma patients' overall recovery</p>
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The Johns Hopkins Hospital. (2017). *Johns Hopkins Nursing Evidence-Based Practice: Evidence Level and Quality Guide*.

Table 3. Strategies and Tactics to Achieve Goals

Strategies and Tactics	Goal(s) It Helps You Accomplish
Accountability	
Conduct cyclical small tests of change. <ul style="list-style-type: none"> - Will implement change on only one unit at the trauma center first. This will allow for measurement and insight on how the change may have to be tailored to be successful in all units within the trauma center. 	Have 100% of all traumatically injured patients screened for PTSD/Depression symptoms.
Obtain and use patients/consumers and family input and feedback. <ul style="list-style-type: none"> - Patients and any family members that are educated/connected to TSN resources will be asked for feedback regarding the education they received, what would make it easier for them to access TSN, and any suggestions they have regarding how they connected to it to increase awareness and utilization. 	Have 100% of patients educated on/connected to TSN resources.
Buy-In (Incentives/Disincentives)	
Alter incentive/allowance structures. <ul style="list-style-type: none"> - Recognize staff engagement and participation in implementation of the project through professional recognition, thank you letters, and unit celebration when milestones are achieved. 	Have 100% of nursing staff educated and implementing practice change. Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.
Collaboration, Communication, and Changes in Structures	
Co-create the solution(s) with the population that the intervention is trying to have a positive effect on. <ul style="list-style-type: none"> - Support both staff and patients on having conversations about psychological symptoms and mental health, which is often perceived as a difficult topic, to facilitate open discussions and identifying effective solutions. Encouraging more discussions regarding this topic can help increase early identification and interventions. - This strategy/tactic also needs to be applied to the vulnerable patient population, such as patients that are non-English speaking, have low-health literacy, and/or are experiencing emotional reactions. These patients are eligible for screening and should also be connected to TSN resources, so additional resources and enhanced collaboration/communication may be needed. This could include use of portable translator mobile device, direct referral to TSN coordinator, and increased time spent with patient (or patient’s family if they consent) to effectively communicate with them, ensuring they understand and addressing any questions they may have. 	Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.
Identify and prepare champions. <ul style="list-style-type: none"> - Identify staff members on unit that are interested in the project and have interest in ensuring it is successful. Educate champions on the importance of the practice change and intended outcomes. Educate and provide them with resources they can provide to staff to enhance engagement and buy-in. 	Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.
Meetings	Have 100% of eligible patients screened for PTSD/Depression symptoms.

<ul style="list-style-type: none"> - Participate in monthly unit meetings to educate staff on project, address any staff questions or issues they have encountered, provide them with resources to facilitate practice change. 	<p>Have 100% of eligible patients educated and connected to TSN resources.</p>
<p>Change record systems</p> <ul style="list-style-type: none"> - There is no data collection or recording of patients screened for PTSD/Depression or patients educated/connected to TSN resources. In order to assess the implementation and outcomes, a sheet will be created to record which patients have been administered the screen and if they were provided with education regarding TSN resources. There will also be an area to record which patients were referred to the TSN coordinator. The record sheet will be kept with the Charge Nurse and will be reviewed each day to determine which patients still need screening and/or education. This record will be used to collect data on the implementation and measure the outcomes of interest. 	<p>Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.</p>
Data	
<p>Assess for readiness and identify barriers and facilitators.</p> <ul style="list-style-type: none"> - Organizational policies/procedures have been reviewed, discussions with key organization members and staff. Interview staff during implementation phase to assess any barriers they are facing and develop ideas to facilitate the implementation process that will allow staff to conduct screening in timely manner that does not impede their workflow. 	<p>Have 100% of patients screened for PTSD/Depression symptoms</p>
<p>Complete audits and provide feedback.</p> <ul style="list-style-type: none"> - Collect data to track progress of implementation to determine what percentage of patients are being screened and what percentage of patients are being educated/connected to TSN resources or referred to the TSN coordinator. The data will be collected from the Charge Nurse report sheet that will be created for the project. This will also allow for tracking of the progress to determine if goal is close to being met, can then identify/assess any barriers that are impeding the implementation. 	<p>Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.</p>
Education	
<p>Conduct ongoing training.</p> <ul style="list-style-type: none"> - Presence on unit and attendance at staff meetings will allow for ongoing education regarding the project and will allow for staff to ask any questions and receive needed clarification. 	<p>Have 100% of nursing staff educated and implementing practice change. Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.</p>
<p>Distribute educational materials</p> <ul style="list-style-type: none"> - Educational materials regarding importance of PTSD/Depression screening and psychological sequelae, TSN resources, and how patients can be referred to the TSN will be provided to staff and available on unit. Educational material regarding TSN resources available to patients will be provided to them once screening has been conducted. 	<p>Have 100% of nursing staff educated and implementing practice change. Have 100% of eligible patients screened for PTSD/Depression symptoms. Have 100% of eligible patients educated and connected to TSN resources.</p>

Table 4. Evaluation of Strategies and Tactics Used

Tactic Used	Effectiveness of Tactic	Next Steps
Accountability: Conduct small tests of change	Tactic effective as it allows for focus on one unit in the trauma center, rather than attempting implementation of practice change across numerous trauma units which would require significantly more availability of personal and professional resources. Conducting a small test of change on one unit has proven to be challenging, as seen with the increased amount of time it took to educate all staff (5 weeks) and the still lower than anticipated engagement in implementation.	Continue to implement practice change on the one trauma unit to facilitate unit engagement and continue to work towards meeting identified goals.
Buy-In: Alter incentive/allowance structure Recognition of unit participation and engagement in implementation of project by providing staff with baked goods as a sign of appreciation. Spoke with staff and thanked them each for their individual participation and engagement.	Tactic was somewhat effective as it increased staff engagement while present on the unit; however, the tactic did not seem to have a great, positive impact on overall staff buy-in and engagement in the project. Difficult tactic to successfully execute during time period due to excessive staff shortages, increased workload, and high patient acuity.	Continue to offer incentives and recognition of all staff members, it may improve buy-in overtime, but it also demonstrates to the staff the genuine interest of wanting to improve their situation as well as patient outcomes.
Collaboration, Communication, and Changes in Structures: co-create solutions with population, participate in meetings	Communication and collaborating with the staff members of the unit was effective in developing a process flow that they felt would fit their needs best. Although project implementation process was developed through collaboration and ongoing communication and adjustments, engagement in implementation is still low across unit.	Continue to communicate and collaborate with nursing unit champions and staff.
Data: Assess for readiness and identify barriers/facilitators	Assessment of unit preparedness and identification of barriers/facilitators allowed for improved development of practice change process flow to better fit unit and staff needs. Identification and understanding of barriers allows for establishment of realistic expectations and understanding of the low engagement from staff due to the presence of the many challenges in health care they are encountering.	Continue to assess the barriers to the implementation process as well as facilitators to improve dissemination of findings and share pertinent information and possible solutions with future project developers.
Data: Complete Audits and provide feedback	Completion of audits and providing feedback has proved to be successful for assessing data trends and the progress made towards the set goals.	Continue with audits and feedback.
Education: Conduct ongoing training	Conducting ongoing training has proved to be a successful tactic. Ongoing training was vital to getting	Continue with periodic ongoing training during implementation phase.

	all nursing staff educated since often all staff are not present on unit or at meeting at the same time. Ongoing training also reinforces the goals of the practice change and offers the ability to communicate and adjust tactics as needed.	
Education: Distribute educational materials	Distribution of educational materials to both staff and patients is an effective tactic as it serves as a resource for them and a reminder of the information that was discussed with them.	Continue distributing educational materials and ensuring availability on the unit.

Table 5. Consolidated Framework for Implementation Research (CIFR) – Identified Barriers & Facilitators

Project Goal: 100% of trauma patients will be screened for PTSD/Depression risk factors. 100% of trauma patients will receive education on TSN and how they can access the resource.		
CIFR Constructs	Implementation Barriers Identified	Implementation Facilitators Identified
Outer Setting: Patient Needs & Resources	Physiological needs of patients are heavily prioritized on inpatient unit, placing less emphasis and even awareness of the importance of meeting patients' mental health needs. Less prioritization is placed on addressing patient's support system and ensuring patient is connected to TSN during hospitalization and following discharge.	Organization as a whole does emphasize importance of caring for the "whole" patient, including their addressing their support system and caring for the patient's overall well-being. Organization has made TSN resources available and continues to support the program.
Inner Setting: Relative Priority	Some nurses on the unit have reported not having the time or opportunity to complete the screening as well as finding it challenging to provide each patient with direct education on TSN due to competing tasks that take priority.	Unit Champion and Senior Clinical Nurses have expressed strong interest and active participation in implementation as they also agree that the implementation is important and something that could result in positive outcomes for patients.
Inner Setting: Learning Climate	Due to nursing staff shortages and already demanding workload, some individuals on the unit have expressed that there is not sufficient time or ability to fully reflect and partake in the implementation process. With this some have also felt as if they are not fully partnered or knowledgeable about the changes.	Organization welcomes learning and quality improvement process changes, creating a climate that staff can feel comfortable implementing a change and providing feedback on what is and is not working.
Characteristics of Individuals: Knowledge & Beliefs about the Intervention	Many members of the nursing staff are not familiar with the potential psychosocial sequelae of traumatic injury, the impact it can have on long-term outcomes, and the importance of screening. While nursing staff are aware of the TSN, many are not very familiar with what TSN offers, how to connect patients, and the importance of providing all patients with education on the resource.	Many stakeholders, including the CSR, Unit Champion, and Senior Clinical Nurses value the implementation and understand the importance it has for patient's outcomes. These team members are also familiar with the TSN and are valuable resources for promoting positive attitudes and increasing the nursing staff's knowledge.
Process: Engaging	Engaging nursing staff in the implementation has proved to be a challenge due to many reasons, including frequent unit staff shortages, many nurses precepting or on orientation - limiting the time they have to actively engage, and being busy with tasks and patient care activities.	Participating in unit meetings has allowed for the best opportunity to engage the greatest amount of nursing staff.

Figure 1

Theoretical Framework: Bandura's Self-Efficacy Theory

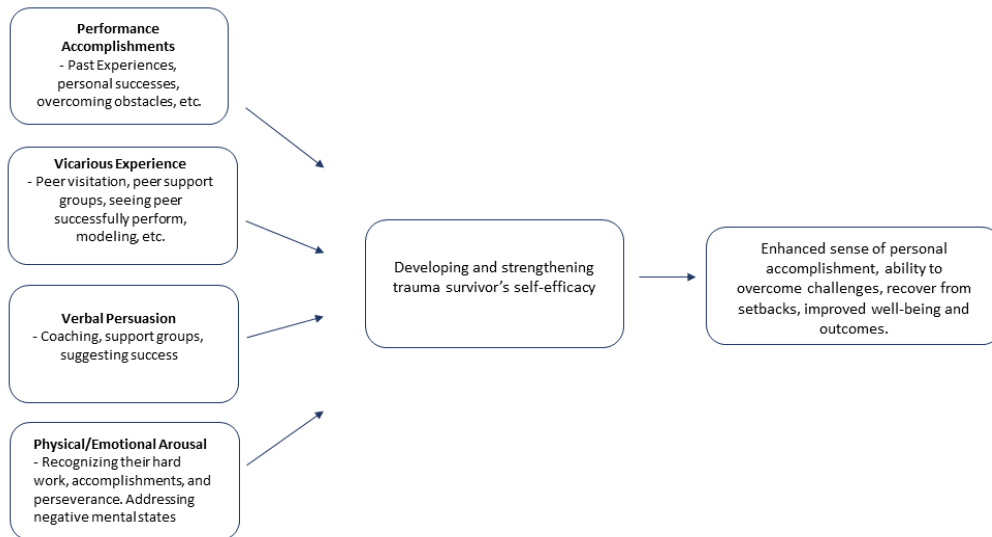


Figure 2

Theoretical Framework: Implementation Science

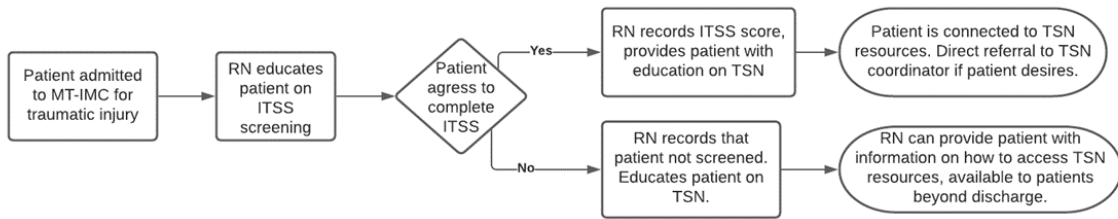
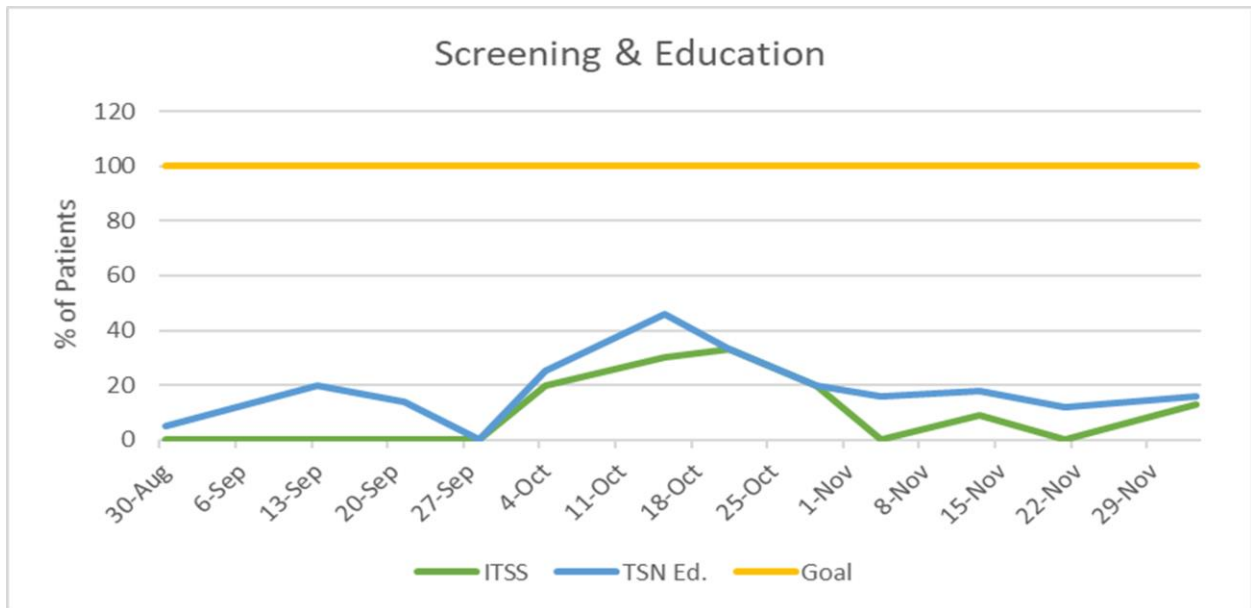


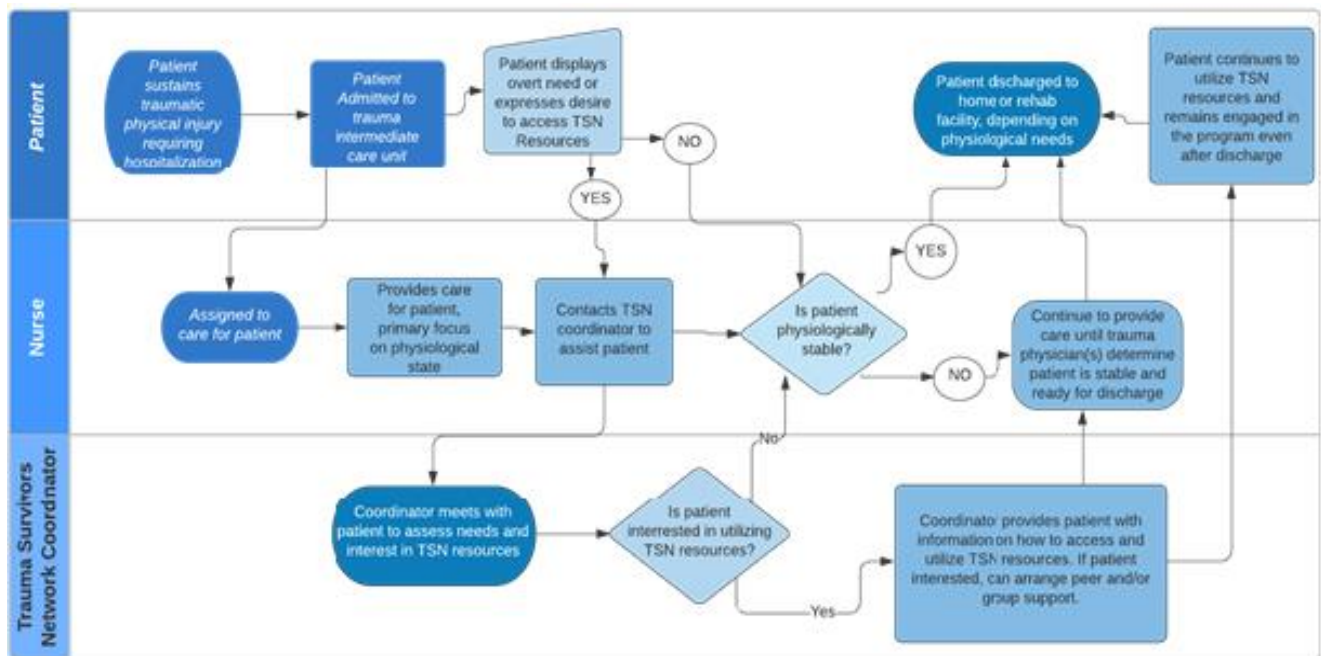
Figure 3

ITSS and TSN Education Conducted



Appendix A

Current Process Flow Map



Appendix B

Injured Trauma Survivor Screen (ITSS)

Injured Trauma Survivor Screen (ITSS)

1 = Yes 0 = No

Before this injury	PTSD	DEP
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. Do you find yourself thinking that the world is unsafe and that people are not to be trusted?	1 0	
≥ 2 is positive for PTSD risk ≥ 2 is positive for Depression risk	SUM =	

Appendix C

Charge Nurse Report Sheet for Implementation of PTSD/Depression Screening and TSN

Bed	Eligible for Screening? (Yes or No)	Screened using ITSS (Yes or No)	ITSS Score (≥ 2 for PTSD and/or Depression OR < 2)	Educated/Connected to TSN – Provided w/ resource information (Yes or No)	Referred to TSN Coordinator (Yes or No)
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					