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# Prevalence and Treatment of Depression and Posttraumatic Stress Disorder among Trauma Patients with Non-neurological Injuries

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## ABSTRACT

### Background

Psychological impairment among injury survivors is well documented. Little is known about the prevalence of treatment of psychological impairment, however. We aimed to determine the proportion of injury survivors treated for depression and post-traumatic stress disorder (PTSD) in the year after injury as well as to determine potential barriers to treatment.

### Methods

Adults (18 and over) admitted to a Level I trauma center with an injury severity score (ISS) greater than 10, but without traumatic brain injury or spinal cord injury were eligible for study inclusion. The Center for Epidemiological Studies-Depression (CES-D) and PTSD CheckList – Civilian Versions (PCL-C) surveys were administered during the initial hospitalization and repeated at 1, 2, 4, and 12 months after injury. Patients were asked if they received treatment specifically for depression or PTSD at each follow-up. Factors associated with treatment were determined using multivariable logistic regression analysis.

### Results

500 injury survivors were enrolled in this prospective observational study. Of those, 68.4% of patients screened positive for depression at some point in the year after their injury (53.3% 1 month, 49.9% 2 month, 49.0% 4 month, and 50.2% 12 month). Only 22.2% of depressed patients reported receiving treatment for depression. 44.4% of patients screened positive for PTSD (26.6% 1 month, 27.8% 2 month, 29.8% 4 month, and 30.0% 12 month), but only 9.8% received treatment for PTSD. After adjusting for other factors, compared to commercial insurance status, self-pay insurance status was negatively associated with treatment for PTSD or depression (OR 0.44, 95% CI 0.21-0.95).

**Conclusion**

Depression and PTSD are common in non-neurotrauma patients in the year following injury. Greater collaboration between those caring for injury survivors and behavioral health experts may help improve psychological outcomes after injury.

Level of Evidence: Level III Prognostic

Key Words: Post-traumatic stress disorder treatment; Depression treatment; Post-traumatic stress disorder after injury; depression after injury

## BACKGROUND

Approximately 2.6 million hospitalizations and 36 million emergency room visits due to injury occur each year in the United States. Further, the cost to the United States economy is upwards of an estimated $600 million per year in terms of direct and indirect costs that result from injury and its aftermath (1, 2). It is now well established that injury survivors are at increased risk for not just a decrease in quality of life, but also at risk for suffering adverse psychological outcomes (3,4,5). Increasingly, Posttraumatic Stress Disorder (PTSD), depression, anxiety, and substance use are recognized as common mental health disorders in the injured population (6). Prevalence of PTSD after injury has been reported as high as 42% at 6 months post injury (7, 8). Moreover, studies have found that PTSD affects 23% of those who survive a traumatic injury a full year after their initial hospitalization (3, 9). Depression has been found to affect nearly a quarter of the injury survivors and anxiety has been found in up to 22% of injury survivors at 6 months post injury (6). Therefore, surveillance of mental health issues both during the inpatient stay and after hospital discharge is important for trauma centers seeking to not only help patients survive injury, but also to thrive during recovery.

The American College of Surgeons (ACS) – Committee on Trauma (COT) championed the use of screening protocols to detect and to intervene on injured patients with alcohol use disorders. For over a decade this has been a requirement for ACS-COT verification of trauma centers (10). Recently, the ACS released a statement in strong support of screening protocols for PTSD among injury survivors (11). However, few interventions are currently in place in most hospitals to address PTSD and other mental health issues among injured patients. Further, surgeons can face challenges in referring patients to behavioral health services, such as long wait times to see mental health providers, patients' lack of health insurance, transportation

difficulties, and other potential barriers to care (12). It often falls to primary care physicians to detect and treat mental health disorders in the outpatient setting, who may lack training in trauma-informed care and prescribing psychiatric medication (13, 14, 15). Addressing this need and understanding factors associated with not receiving treatment could have substantial impact on the quality of life in injury survivors. To address this gap in the literature, the objectives of this study were to examine the prevalence of depression and posttraumatic stress disorder (PTSD) in non-neurologically injured patients. Further, we aimed to determine the proportion of injury survivors treated for depression and PTSD in the year after injury.

## METHODS

*Data Source*

This is a prospective cohort study that followed injured patients for 12 months after injury. The cohort included patients admitted for injury at a Level 1 trauma center between 2009 and 2012. Patients aged 18 years or older who had an injury severity score (ISS) greater than 10, but without traumatic brain injury or spinal cord injury, were eligible to participate in the study. Baseline surveys assessing depression, PTSD, alcohol use, and drug use prior to injury were administered during the inpatient stay. The surveys used to assess each outcome were the Center for Epidemiologic Studies Depression Scale (CES-D); Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C); Alcohol Use Disorders Identification Test (AUDIT); and the Drug Abuse Screening Test (DAST-10), respectively. Depression, PTSD, alcohol use, and drug use surveys were repeated during follow-up assessments at 1, 2, 4 and 12 months after injury. Patients were also asked if they received treatment for 1) depression, 2) PTSD, 3) alcohol use, and 4) drug use at each follow-up assessment. Demographic and clinical variables were

collected on patient age, gender, race, insurance status, injury severity, and employment upon hospital arrival. The primary independent variable of interest was treatment for mental health issues, specifically depression and PTSD.

*Analysis*

The objective of this study was to determine the percentage of patients who receive mental health treatment after injury. We examined demographic and clinical characteristics between patients with mental health disorders and without mental health disorders. We also examined associations between those receiving mental health treatment and those who did not. Differences in the baseline characteristics were assessed using X-square and Fisher's exact tests.

Patient characteristics predictive of mental health treatment were evaluated using multivariable logistic regression. For this analysis, three logistic regression models were used to predict mental health treatment for 1) depression, 2) PTSD, and 3) treatment for any mental health condition (depression, PTSD, alcohol use, or drug use) among patients who screened positive for at least one mental health condition. A respective binary treatment variable was used as the dependent variable for each model. The logistic regression model controlled for specific mental health condition, age, race, gender, employment, insurance status, and injury severity score.



## RESULTS

*Cohort Characteristics*

A total of 500 patients enrolled in the study. Follow-up was 93% at 1 month, 82% at 2 months, 70% at 4 months and 58% at 12 months. Slightly over half the sample was under 35

years of age at baseline (50.8%) and less than 10% was over 60 (7.0%), indicating a relatively young sample of the trauma population. Approximately 50% of the cohort was white (50.6%) and the majority was male (64.8%). A large proportion of participants were uninsured at baseline (42.2%). Of those with insurance coverage, 34.2% had private insurance, 11.4% had Medicaid, and 5.6% had Medicare. The majority of patients were employed at baseline (64.4%). The ISS was less than 15 in 29.5% of participants, 36.8% had ISS between 16 and 24, and 30.4% had ISS equal to 25 or greater. (**Table 1**)

*Prevalence of Mental Health Conditions and Percentage of Patients Receiving Mental Health Treatment in the 12 Months Following Injury*

Overall, the majority of patients screened positive for depression at some point during their first 12 months of recovery (72.2%). Nearly half also screened positive for PTSD (46.8%). Hazardous drinking and substance use were less commonly reported (31.6% Hazardous Drinking and 13.3% Substance Use Disorder (SUD)). (**Table 2**) Of patients who screened positive for a mental health condition, we found that the majority reported receiving no mental health treatment. Nearly 70% of patients with depression reported receiving no treatment and 82% of patients with PTSD reported receiving no treatment for their conditions. The percentage of patients who received no treatment for hazardous drinking and/or SUD was also high (90.6% and 84.1%, respectively). (**Table 3**)

*Characteristics of Patients with Mental Health Issues*

Patients with depression were significantly more likely to be under 35, male, and employed at baseline. PTSD was significantly more likely to occur in younger patients, males,

uninsured patients, and patients employed at baseline. Patients who screened positive for hazardous drinking were significantly more likely to be male and uninsured. SUD was also significantly more common in males and uninsured patients. Neither injury severity nor race/ethnicity were associated with a positive screening for any of the mental health conditions examined. (**Table 4**)

We compared PTSD and depression outcomes between patients who were intentionally injured and those who were non-violently injured. We found no significant difference in PTSD between the two groups. At baseline, 8.3% of violently injured patients screened positive for PTSD and 8.0% of non-violently injured patients screened positive for PTSD. However, a significantly higher number of violently injured patients screened positive for PTSD at the 6 month time point (45.9%) compared to those non-violently injured (25.8%, p=0.002). Although not technically significant (p=0.087), a larger percentage of violently injured patients (39.2%) also have PTSD one year after their injury compared to those non=violently injured (27.2%). Depression follows a similar pattern. At baseline there was no difference between the violently injured patients who screened positive for depression (22.9%) compared to those who were non-violently injured (17.3%). We found that at 6 and 12 months, compared to non-violently injured patients, a greater percentage of violently injured patients screened positive for depression (65.6% vs 44.8%, p=0.003 and 65.6% vs 44.8%, p=0.029, respectively).

*Characteristics of Patients with Mental Health Issues who Receive Treatment*

Patients who received treatment for depression most commonly had private insurance (33.0%, p=0.001). Patients that reported treatment for PTSD were more often male (53.1%, p=0.018), uninsured (32.7%, p=0.007), and employed (53.1%, p=0.047). There were no

significant associations between patient characteristics examine and alcohol or SUD treatment, although a relatively small number of patients reported receiving treatment for those conditions. (**Table 5**)

*Predictors of Mental Health Treatment*

In Model 1, we examined predictors of receiving treatment for depression among depressed patients. We found that patients with the insurance category type of "other" were more likely to receive treatment for their depression compared to privately insured individuals (OR 13.53, 95% CI 1.29-141.89). In Model 2, we found patients with PTSD were more likely to receive treatment for PTSD if they were insured by either Medicaid or "other" types of insurance at baseline compared to those with private insurance (OR 5.33, 95%CI 1.15-24.64; OR 47.42, 95% CI 2.72-828.15, respectively). In Model 3, we included patients who screened positive at least one mental health condition (depression, PTSD, hazardous drinking, SUD) and predictors of receiving any type of mental health treatment. We found patients who were uninsured were significantly less likely to receive treatment (OR 0.44, 95% CI 0.21-0.95). We also found that screening positive for PTSD or hazardous drinking significantly increased the likelihood of receiving mental health treatment (OR 3.64, 95% CI 1.72-7.71; OR 2.02, 95% CI 1.002-4.09, respectively). (**Table 6**)

## DISCUSSION

In this study we found that more than 70% of injured patients screened positive for depression and over 40% screened positive for PTSD up to one year out from the original injury. These findings are consistent with the high prevalence of these disorders reported by other

investigators. At the same time, though, only 18% of the patients who screened positive for PTSD received treatment for PTSD. Further, only 28% of patients who screened positive for depression received treatment. After controlling for other factors, insurance status was the main factor associated with obtaining treatment. The high prevalence of injured patients who screened positive for depression and PTSD was consistent with previous publications citing prevalences ranging from 8 - 60% for these disorders (3, 8, 16, 17, 18). Previous studies also indicate that patients with depression and PTSD are at higher risk of poor quality of life outcomes compared to those without depression or PTSD (3, 8, 17). This highlights the need for a systematic approach at trauma centers to improve the mental health of patients after injury

Our data support this call to action and demonstrate a high prevalence of mental health conditions in the year after injury with few patients reporting treatment. Injury severity was not associated with the development of any mental health disorder examined in the current study. This suggests other behavioral or social risk factors must be explored to identify patients most likely to develop a mental health issue following injury. It also indicates that screening the entire injured population is needed until populations of high-risk patients can be identified and targeted for screening.

Once screening for these psychological disorders is more common, there will need to be a concomitant increase in the number of patients actively treated for depression and PTSD. In the current study, the minority of patients who screened positive for a psychological disorder received treatment. Insurance status appeared to be the only factor associated with receiving treatment. In fact, having no insurance was a strong negative predictor of receiving treatment for any of the disorders studied. However, receiving treatment for PTSD or alcohol use appeared to increase the chance of receiving treatment for one of the other psychological co-morbidities.

This suggests that once a patient with a psychological issue is identified and begins receiving treatment, other comorbid psychological issues are discovered and treated.

Once patients are identified, trauma centers and trauma surgeons will need to have a mechanism to make sure patients have access to effective treatment. There is increasing evidence that symptoms of PTSD and depression occur early after injury, possibly even during the initial hospitalization (3,17). Patients who exhibit these early symptoms are at risk of developing the formal diagnosis in the year after injury. Some trauma centers have adopted collaborative care models that work with behavioral health specialists to begin treatment soon after injury. The Medical University of South Carolina recently launched a Trauma Resilience and Recovery Program (TRRP) which focuses on a 4-step plan that brings a multidisciplinary team together to detect, monitor, and treat PTSD in injured patients (19). The University of Washington also has pioneered a program, which utilizes an automated electronic medical record screening program to detect patients at risk for PTSD (20). Unfortunately, these types of programs are not yet common practice and more research is needed to understand how to best treat injury survivors, who are demographically, socioeconomically, and medically diverse and complex. Further, we found that there were differences between non-violently injured patients and those who were violently injured. Those who were violently injured were more likely to suffer PTSD or depression in the year following injury compared to those non-violently injured. Therefore, it is likely that not only screening, but linking intentionally injured patients to mental health resources early in their recovery would help direct resources to a higher risk group of patients.

This study has several limitations. While early follow-up was good in this prospective study, later time points were more affected by attrition. It is possible that there was differential

follow-up of patients with psychological disorders and for those who received treatment. We also have no data on the trauma recidivism of these patients. It is possible that some patients may have been reinjured during the follow-up period and this may have influenced the development of PTSD or depression or another injury may have interfered with a patient's ability to receive treatment. We also depended on patient self-report regarding obtaining treatment for any of the psychological disorders we studied. Most patients would be expected to know if they were receiving treatment for a psychological issue after injury, but, we were not able to independently verify treatment. We were also unable to determine the type of provider who treated the patient for PTSD or depression if a patient did receive treatment for either disorder. To address some of these issues we chose to examine all data reported in the 4 follow-ups that took place over 12 months after injury. We also did not examine specific changes in status in insurance or employment, which may impact the likelihood of receiving treatment. We chose to analyze baseline data due to its completeness. Future work will look more closely at specific mental health conditions and how life changes over the course of recovery impact the development of depression and PTSD and whether these changes affect the likelihood of receiving mental health treatment.

The implications of the findings of this study are profound for those who care for injured patients. Trauma surgeons and trauma centers are uniquely positioned to take the lead on screening for PTSD and depression among injured patients. Because of the number of patients at risk for these psychological conditions a systematic treatment program must also be in place. As most trauma patients primarily follow-up with surgical and primary care providers, who may not be trained to address mental health, continued research is needed to ensure proper treatment once the patients are identified (21, 22). As we learn more regarding appropriate treatment, policy

changes by entities that govern trauma center verification and designation such as the ACS-COT or state departments of health should consider mandating screening and interventions for these disorders with a goal of reducing the overall burden of injury in the United States.

Author contributions: TB analyzed the data and drafted the manuscript. AV assisted with drafting the manuscript. BLZ conceived the study, obtained funding, gathered data, and critically revised the manuscript.

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**Table 1. Cohort Characteristics at Baseline**

| | | n | Percentage |
|---|---|---|---|
| Age | 18-35 | 254 | 50.8% |
| | 36-45 | 91 | 18.2% |
| | 46-60 | 120 | 24.0% |
| | Over 60 | 35 | 7.0% |
| Gender | Female | 176 | 35.2% |
| | Male | 324 | 64.8% |
| Race/Ethnicity | White | 253 | 50.6% |
| | Black | 243 | 48.6% |
| | Hispanic | 2 | 0.4% |
| | Asian | 2 | 0.4% |
| Insurance Type | Private | 171 | 34.2% |
| | Medicare | 28 | 5.6% |
| | Medicaid | 57 | 11.4% |
| | Self-Pay | 211 | 42.2% |
| | Other | 16 | 3.2% |
| | Unknown | 17 | 3.4% |
| Employment | Employed | 322 | 64.4% |
| | Unemployed | 110 | 22.0% |
| | Retired | 14 | 2.8% |
| | Student/Homemaker | 27 | 5.4% |
| | Unable to Work | 27 | 5.4% |
| Injury Severity Score | Less than 15 | 148 | 30.6% |
| | 16 - 24 | 184 | 38.0% |
| | 25 - 34 | 123 | 25.4% |
| | 35 and greater | 29 | 6.0% |

**Table 2. Prevalence of Patients Screening Positive for Mental Health Issues in the 12 Months Following Injury**

| | | n | Percentage |
|---|---|---|---|
| Depression | Negative | 132 | 27.8% |
| | Positive | 342 | 72.2% |
| Posttraumatic Stress Disorder | Negative | 252 | 53.2% |
| | Positive | 222 | 46.8% |
| Hazardous Drinking | Negative | 208 | 68.4% |
| | Positive | 96 | 31.6% |
| Substance Use Disorder | Negative | 411 | 86.7% |
| | Positive | 63 | 13.3% |

**Table 3. Patients Reporting Mental Health Treatment At Any Follow-up Who Screened Positive for at least one Mental Health Condition**

| | Depression | | | | Post-Traumatic Stress Disorder | | | | Hazardous Drinking | | | | Substance Use Disorder | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Treatment | | Treatment | | No Treatment | | Treatment | | No Treatment | | Treatment | | No Treatment | | Treatment | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Depression | 239 | 69.9% | 103 | 30.1% | 295 | 86.3% | 47 | 13.7% | 334 | 97.7% | 8 | 2.3% | 335 | 98.0% | 7 | 2.0% |
| Post-Traumatic Stress Disorder | 133 | 59.9% | 89 | 40.1% | 182 | 82.0% | 40 | 18.0% | 215 | 96.8% | 7 | 3.2% | 215 | 96.8% | 7 | 3.2% |
| Hazardous Drinking | 66 | 68.8% | 30 | 31.3% | 83 | 86.5% | 13 | 13.5% | 87 | 90.6% | 9 | 9.4% | 90 | 93.8% | 6 | 6.3% |
| Substance Use Disorder | 42 | 66.7% | 21 | 33.3% | 57 | 90.5% | 6 | 9.5% | 55 | 87.3% | 8 | 12.7% | 53 | 84.1% | 10 | 15.9% |

**Table 4.** Characteristics of Patients who Screen Positive for Mental Health Conditions At Any Follow-up

| | | Depression Any | | | Post-Traumatic Stress Disorder | | | Hazardous Drinking | | | Substance Use Disorder | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | % | p value | n | % | p value | n | % | p value | n | % | p value |
| Age | 18-35 | 182 | 53.2% | 0.002 | 117 | 52.7% | 0.01 | 47 | 49.0% | 0.05 | 32 | 50.8% | 0.131 |
| | 36-45 | 63 | 18.4% | | 37 | 16.7% | | 21 | 21.9% | | 12 | 19.0% | |
| | 46-60 | 83 | 24.3% | | 61 | 27.5% | | 27 | 28.1% | | 19 | 30.2% | |
| | Over 60 | 14 | 4.1% | | 7 | 3.2% | | 1 | 1.0% | | 0 | 0.0% | |
| Gender | Female | 134 | 39.2% | 0.006 | 92 | 41.4% | 0.009 | 21 | 21.9% | 0.002 | 12 | 19.0% | 0.003 |
| | Male | 208 | 60.8% | | 130 | 58.6% | | 75 | 78.1% | | 51 | 81.0% | |
| Race/Ethnicity | White | 172 | 50.3% | 0.149 | 110 | 49.5% | 0.234 | 43 | 44.8% | 0.422 | 29 | 46.0% | 0.757 |
| | Black | 168 | 49.1% | | 110 | 49.5% | | 53 | 55.2% | | 34 | 54.0% | |
| | Hispanic | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | |
| | Asian | 2 | 0.6% | | 2 | 0.9% | | 0 | 0.0% | | 0 | 0.0% | |
| Insurance | Private | 106 | 31.0% | 0.196 | 58 | 26.1% | 0.015 | 15 | 15.6% | <0.001 | 13 | 20.6% | 0.013 |
| | Medicare | 19 | 5.6% | | 16 | 7.2% | | 4 | 4.2% | | 2 | 3.2% | |
| | Medicaid | 43 | 12.6% | | 31 | 14.0% | | 9 | 9.4% | | 4 | 6.3% | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self-Pay | 153 | 44.7% | | 104 | 46.8% | | 64 | 66.7% | | 41 | 65.1% | |
| | Other | 9 | 2.6% | | 6 | 2.7% | | 1 | 1.0% | | 1 | 1.6% | |
| | Unknown | 12 | 3.5% | | 7 | 3.2% | | 3 | 3.1% | | 2 | 3.2% | |
| Employment | Employed | 211 | 61.7% | 0.008 | 120 | 54.1% | <0.001 | 57 | 59.4% | 0.104 | 34 | 54.0% | 0.053 |
| | Unemployed | 83 | 24.3% | | 63 | 28.4% | | 28 | 29.2% | | 23 | 36.5% | |
| | Retired | 5 | 1.5% | | 3 | 1.4% | | 0 | 0.0% | | 0 | 0.0% | |
| | Student/Homemaker | 21 | 6.1% | | 16 | 7.2% | | 4 | 4.2% | | 3 | 4.8% | |
| | Unable to Work | 22 | 6.4% | | 20 | 9.0% | | 7 | 7.3% | | 3 | 4.8% | |
| Injury Severity | Less than 15 | 97 | 29.3% | 0.18 | 59 | 27.4% | 0.179 | 36 | 38.7% | 0.173 | 20 | 32.8% | |
| Score | | | | | | | | | | | | | 0.607 |
| | 16 - 24 | 124 | 37.5% | | 87 | 40.5% | | 27 | 29.0% | | 26 | 42.6% | |
| | 25 - 34 | 93 | 28.1% | | 60 | 27.9% | | 24 | 25.8% | | 13 | 21.3% | |
| | 35 and greater | 17 | 5.1% | | 9 | 4.2% | | 6 | 6.5% | | 2 | 3.3% | |

**Table 5. Characteristics of Patients with Mental Health Conditions that Received Treatment at Any Follow-up**

| | | Depression Treatment | | | Post-traumatic Stress Disorder Treatment | | | Hazardous Drinking Treatment | | | Substance Use Disorder Treatment | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | Percent | p value | n | Percent | p value | n | Percent | p value | n | Percent | p value |
| Age | 18-35 | 50 | 45.9% | 0.160 | 24 | 49.0% | 0.265 | 5 | 50.0% | 0.897 | 6 | 60.0% | 0.879 |
| | 36-45 | 26 | 23.9% | | 9 | 18.4% | | 2 | 20.0% | | 2 | 20.0% | |
| | 46-60 | 29 | 26.6% | | 16 | 32.7% | | 3 | 30.0% | | 2 | 20.0% | |
| | Over 60 | 4 | 3.7% | | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | |
| Gender | Female | 49 | 45.0% | 0.065 | 26 | 53.1% | 0.018 | 3 | 30.0% | 0.607 | 5 | 50.0% | 0.419 |
| | Male | 60 | 55.0% | | 23 | 46.9% | | 7 | 70.0% | | 5 | 50.0% | |
| Race/Ethnicity | White | 65 | 59.6% | 0.056 | 30 | 61.2% | 0.250 | 5 | 50.0% | 0.971 | 7 | 70.0% | 0.454 |
| | Black | 43 | 39.4% | | 19 | 38.8% | | 5 | 50.0% | | 3 | 30.0% | |
| | Hispanic | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | |
| | Asian | 1 | 0.9% | | 0 | 0.0% | | 0 | 0.0% | | 0 | 0.0% | |
| Payment Category | Private | 36 | 33.0% | 0.001 | 11 | 22.4% | 0.007 | 3 | 30.0% | 0.891 | 4 | 40.0% | 0.839 |
| | Medicare | 6 | 5.5% | | 4 | 8.2% | | 0 | 0.0% | | 0 | 0.0% | |
| | Medicaid | 22 | 20.2% | | 11 | 22.4% | | 2 | 20.0% | | 2 | 20.0% | |
| | Self-Pay | 35 | 32.1% | | 16 | 32.7% | | 5 | 50.0% | | 4 | 40.0% | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Other | 6 | 5.5% | | 3 | 6.1% | | 0 | 0.0% | | 0 | 0.0% | |
| | Unknown | 4 | 3.7% | | 4 | 8.2% | | 0 | 0.0% | | 0 | 0.0% | |
| Employment | Employed | 62 | 56.9% | 0.499 | 26 | 53.1% | 0.047 | 4 | 40.0% | 0.693 | 5 | 50.0% | 0.915 |
| | Unemployed | 29 | 26.6% | | 10 | 20.4% | | 4 | 40.0% | | 3 | 30.0% | |
| | Retired | 1 | 0.9% | | 1 | 2.0% | | 0 | 0.0% | | 0 | 0.0% | |
| | Student/Homemaker | 7 | 6.4% | | 5 | 10.2% | | 1 | 10.0% | | 1 | 10.0% | |
| | Unable to Work | 10 | 9.2% | | 7 | 14.3% | | 1 | 10.0% | | 1 | 10.0% | |
| Injury Severity | Less than 15 | 29 | 27.6% | 0.970 | 12 | 26.7% | 0.399 | 5 | 50.0% | 0.480 | 4 | 40.0% | 0.154 |
| Score | 16 - 24 | 41 | 39.0% | | 16 | 35.6% | | 3 | 30.0% | | 6 | 60.0% | |
| | 25 - 34 | 29 | 27.6% | | 12 | 26.7% | | 2 | 20.0% | | 0 | 0.0% | |
| | 35 and greater | 6 | 5.7% | | 5 | 11.1% | | 0 | 0.0% | | 0 | 0.0% | |

**Table 6. Predictors of Receiving Mental Health Treatment at Any Follow-up in Patients with at least one Mental Health Condition Reported as Odds Ratios (OR) with Lower Confidence Limits (LCL) and Upper Confidence Limits (UCL).**

| | | Post-traumatic Stress Disorder | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Depression Treatment | | | Treatment | | | Any Mental Health Treatment | | |
| | | OR | LCL | UCL | OR | LCL | UCL | OR | LCL | UCL |
| Age | 18-35 | Reference | | | Reference | | | Reference | | |
| | 36-45 | 1.18 | 0.51 | 2.73 | 1.39 | 0.32 | 6.04 | 1.20 | 0.51 | 2.79 |
| | 46-60 | 0.95 | 0.42 | 2.15 | 1.14 | 0.29 | 4.46 | 0.67 | 0.31 | 1.47 |
| | Over 60 | Not Estimated | | | Not Estimated | | | 0.53 | 0.05 | 6.22 |
| Gender | Male | Reference | | | Reference | | | Reference | | |
| | Female | 1.30 | 0.64 | 2.67 | 2.54 | 0.76 | 8.50 | 1.30 | 0.64 | 2.64 |
| Race | White | Reference | | | Reference | | | Reference | | |
| | Black | 0.74 | 0.37 | 1.50 | 0.42 | 0.12 | 1.42 | 0.69 | 0.35 | 1.34 |
| Payment Category | Private | Reference | | | Reference | | | Reference | | |
| | Medicare | 0.40 | 0.05 | 3.04 | 0.84 | 0.05 | 13.17 | 0.19 | 0.03 | 1.45 |
| | Medicaid | 3.12 | 1.04 | 9.39 | 5.33 | 1.15 | 24.64 | 1.88 | 0.64 | 5.58 |
| | Self-Pay | 0.87 | 0.40 | 1.86 | 0.89 | 0.23 | 3.40 | 0.44 | 0.21 | 0.95 |
| | Other | 13.53 | 1.29 | 141.89 | 47.42 | 2.72 | 828.15 | 9.59 | 0.87 | 105.35 |
| Employment | Employed | Reference | | | Reference | | | Reference | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Unemployed | 1.34 | 0.63 | 2.85 | 1.00 | 0.27 | 3.64 | 1.03 | 0.49 | 2.13 |
| | Retired | | NE | | | NE | | | NE | |
| | Student/Homemaker | 0.36 | 0.08 | 1.56 | 1.16 | 0.21 | 6.53 | 0.40 | 0.10 | 1.53 |
| | Unable to Work | 2.33 | 0.50 | 10.85 | 1.55 | 0.21 | 11.19 | 1.59 | 0.33 | 7.60 |
| Injury Severity Score | Less than 15 | | Reference | | | Reference | | | Reference | |
| | 16 - 24 | 1.07 | 0.49 | 2.32 | 0.45 | 0.12 | 1.67 | 1.48 | 0.69 | 3.17 |
| | 25 - 34 | 0.89 | 0.38 | 2.12 | 0.74 | 0.20 | 2.70 | 1.04 | 0.45 | 2.37 |
| | 35 and greater | 1.21 | 0.24 | 5.98 | 0.96 | 0.08 | 11.12 | 1.15 | 0.27 | 4.93 |
| Depression | Negative | | Not Estimated | | | Not Estimated | | | Reference | |
| | Positive | | | | | | | 0.32 | 0.10 | 1.01 |
| Post-traumatic Stress Disorder | Negative | | Not Estimated | | | Not Estimated | | | Reference | |
| | Positive | | | | | | | 3.64 | 1.72 | 7.71 |
| Hazardous Drinking | Negative | | Not Estimated | | | Not Estimated | | | Reference | |
| | Positive | | | | | | | 2.02 | 1.00 | 4.09 |
| Substance Use Disorder | Negative | | Not Estimated | | | Not Estimated | | | Reference | |
| | Positive | | | | | | | 1.37 | 0.63 | 2.99 |