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Rising incidence of interpersonal violence in Pennsylvania during COVID-19 stay-at home order

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Article info
Article history:
Accepted 14 June 2021
Available online 23 June 2021

A B S T R A C T

Background: The coronavirus disease 2019 pandemic and associated policies have had important downstream consequences for individuals, communities, and the healthcare system, and they appear to have been accompanied by rising interpersonal violence. The objective of this study was to evaluate the incidence of injuries owing to interpersonal violence after implementation of a statewide stay-at-home order in Pennsylvania in March 2020.

Methods: Using the Pennsylvania Trauma Outcome Study registry, we conducted a retrospective cohort study of patients with gunshot wounds, stab wounds, and blunt assault-related injuries attributable to interpersonal violence treated at Pennsylvania trauma centers from March 16 to July 31 of 2018, 2019, and 2020.

Results: There were fewer total trauma admissions in 2020 (17,489) vs 2018 (19,290) and 2019 (19,561). Gunshot wounds increased in 2020 to 737 vs 647 for 2019 and 565 for 2018 (P = .028), whereas blunt assault injuries decreased (P = .03). In all time periods, interpersonal violence primarily impacted urban counties. African American men were predominantly affected by gunshot wounds and stab wounds, whereas Caucasian men were predominantly affected by blunt assault injuries. There were more patients with substance abuse disorders and positive drug screens during coronavirus disease than in comparison periods: (stab wound population 52.3% vs 33.9% vs 45.9%, coronavirus disease era vs 2018 vs 2019, respectively P = .0001), (blunt assault injury population 41.4% vs 33.1% vs 33.5%, coronavirus disease era vs 2018 vs 2019, respectively P < .0001). There was no correlation between the incidence of interpersonal violence and coronavirus disease 2019 rates at the county level.

Conclusion: The implementation of a stay-at-home order was accompanied by rising incidence of gunshot and stab wound injuries in Pennsylvania. Preparedness for future resurgences of coronavirus disease 2019 and other pandemics calls for plans to address injury prevention, recidivism, and access to mental health and substance abuse prevention services.

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Introduction

The novel coronavirus disease 2019 (COVID-19) causing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) initially was discovered in December 2019. As of the end of December 2020, there were 20.9 million cases and 329,000 deaths in the United States. In Pennsylvania, there were 639,513 confirmed cases and 17,770 COVID-19-related deaths. SARS-CoV-2 is transmitted primarily via respiratory droplets. Owing to its high transmissibility, social distancing interventions were implemented to isolate COVID-19 patients, to quarantine those exposed, and to limit large gatherings and business operations. The governor of Pennsylvania (PA) enacted a stay-at-home (SAH) order on March 16, 2020. The SAH order was lifted on June 4, 2020, though various restrictions remained in place thereafter. Early single-center or
single-city reports indicate that SAH orders in the United States were accompanied by an increase in interpersonal violence.\textsuperscript{5–16} Although the causes of rising violence are unknown, they may include economic stress, lack of access to structured social support such as schools and employment, and access to firearms.\textsuperscript{3,17} The impact of community interpersonal violence has negative effects on individuals, communities, and strained health systems during a public health crisis such as the COVID-19 pandemic. Understanding the secondary impacts of this pandemic and our responses to it is necessary for a comprehensive public health response. To our knowledge, this study is the first statewide evaluation of the impact of COVID-19-related restrictions on interpersonal violence.

Materials and methods

Study population

We performed a retrospective analysis of patients treated at all 42 PA trauma centers from the onset of SAH on March 16, 2020 through July 31, 2020 and compared this cohort to patients seen during analogous time periods in 2018 and 2019. The research was approved by the Pennsylvania Trauma System Foundation (PTSF) research committee and the University of Pennsylvania Institutional Review Board. Data were collected from the Pennsylvania Trauma Outcomes Study (PTOS) registry, a statewide, prospectively collected trauma registry. The PTOS registry is maintained by dedicated trauma registrars and undergoes the highest levels of validation both locally and at the state level. The data was provided by the PTSF, Mechanicsburg, PA. PTSF specifically disclaims responsibility for any analyses, interpretations, or conclusions.

The PTOS registry includes all patients admitted to a PA trauma center with an injury diagnosis for $\geq$36 hours, or for $\geq$24 hours with an injury severity score (ISS) of $\geq$9. All deaths, including deaths on arrival, are included, as are all transfers, intensive care unit (ICU) admissions, and step-down admissions. Patients with isolated hip fractures are excluded, as are those discharged from the emergency department with no injuries identified and those with a mechanism of asphyxiation, drowning, or poisoning.

The International Statistical Classification of Disease 10th revision diagnosis codes were used to identify patients injured via interpersonal violence, including codes and subcodes for gunshot wound (GSW) (X93, X94, X95), stab wound (SW) (X99), and blunt assault (X92, X96, X97, X98, Y00, Y01, Y02, Y03, Y04, Y07, Y08, Y09, Y21, Y22, Y23, Y24, Y25, Y26, Y28, Y29, Y30, Y31, Y33).

The primary outcome was the incidence of injuries owing to GSW, SW, and blunt assault between all 3 time periods. GSW injury rates were also calculated yearly and for racial subgroups based on population estimates of PA\textsuperscript{18} and PTOS data on demographics. Secondary outcomes included interventions to examine massive transfusion protocol activations, ICU length of stay, ventilator days, hospital length of stay, discharge destinations, complications, and mortality. We collected demographics (age, sex, race, county of residence), injury characteristics and severity (ISS, trauma injury severity score [TRISS], and abbreviated injury score), and admitting physiology (systolic blood pressure, respiratory rate, heart rate, Glasgow Coma Scale score, and oxygen saturation). Alcohol level, urine toxicology, and patient comorbidities were examined.

Geographical analysis

We used ArcGIS software (Esri, Chesterbrook, PA) to map Pennsylvania-county-specific rates of change in interpersonal violence between the COVID era and the prior years. We overlaid these rates with a chloropleth map showing county-level rates of COVID cases per 100,000 people at the conclusion of the study period (Jul 31, 2020), as well as with an indicator of urban versus rural status for each county.\textsuperscript{19}

Statistical analysis

Descriptive analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC). Statistics include measures of central tendency (mean, median) and variation (standard deviation, interquartile range, range) for continuous measures, and frequencies and
percentages for dichotomous and categorical measures. Statistical comparisons were accomplished using 1-way analysis of variance F-statistics, Kruskal-Wallis, and χ² statistics for normally distributed continuous, non-normally distributed continuous, and categorical variables, respectively. For pairwise comparisons of continuous measures, 2-sample t tests and Wilcoxon tests were used for normally and non-normally distributed variables, respectively. To determine any association of COVID-19 era with mortality after injury, we constructed a multivariable logistic regression model adjusting for patient demographics, comorbidities, presenting physiology, injury mechanism and severity, and transfer status based on previously validated risk adjustment models.20

Results

Incidence of injuries owing to interpersonal violence

From March 16 to July 31 in 2018, 2019, and 2020, there were a total of 1,949 admissions with GSW, 667 admissions with SW, and 2,419 admissions with blunt assaults. Although the total number of admissions decreased in 2020 (n = 17,489) compared with 2018 (n = 19,290) and 2019 (n = 19,561), GSW admissions increased from 565 in 2018 and 647 in 2019 to 737 in 2020, P = .028. GSW injury rates per 100,000 population in the state of PA18 was analyzed with an observed statistically significant increase in rates in 2018, 2019, and 2020 (4.41 vs 5.05 vs 5.66 GSW injuries per 100,000 population in 2018, 2019, and 2020, respectively, P < .001). There was no significant change in SW (256 in 2020, 215 in 2018, and 196 in 2019, P = .34). There were significantly fewer blunt assaults in 2020 (660 in 2020, 903 in 2018, and 856 in 2019, P = .030). Figure 1 shows the seasonal distribution of GSW and SW.

Geographic distribution

We categorized 19 PA counties as urban and 48 as rural.21 Five of 19 (26.3%) urban and 10 of 48 (20.8%) rural counties, which accounts for 36.2% of the total state population showed increases in interpersonal violence. SWs increased in 22.6% of rural counties, GSWs increased in 25.8% of rural counties, and blunt assaults increased in 25.8% of rural counties. Analyzing urban PA counties by month, we noted a significant rise in GSW volume in 2020 (P = .010) that peaked in June (n = 173, 5.8%). This was in contrast to peaks in previous years (n = 148 [5.2%] June 2019; n = 137 [4.62%] July 2018). Incidences of SW also increased in urban counties
and 167 (6.0%) in May 2018 (was 140 (4.9%) in June 2020, compared with 168 (5.8%) in July 2019 of PA in 2020. The highest number of assault related admissions SW). Assault-related injuries were less common in urban counties 2019 (peak in July, 42 [1.4%] SW) and 2018 (peak in May, 44 [1.6%] SW) characteristics and outcomes similar across the 3 time periods, as shown in Table I. 737 in the COVID-era group. Demographics and injury character-
istics were similar among the 3 time periods, as shown in Table I. 2018 and 6 in 2019, of patients with gunshot-related injuries from March 16 to July 31

**Table I** Demographics and outcomes of patients with gunshot-related injuries from March 16 to July 31

| Demographics | 2018 (n = 565) | 2019 (n = 647) | 2020 (n = 737) | Total (n = 1949) | P value |
|--------------|---------------|---------------|---------------|----------------|---------|
| Age, median (Q1, Q3) | 27(21, 35) | 27(22, 37) | 26(20, 32) | 26 (21, 34) | .0001 |
| Sex, n (%) | | | | | |
| Male | 511 (90.4%) | 585 (90.4%) | 662 (90.0%) | 1758 (90.2%) | .911 |
| Female | 54 (9.6%) | 62 (9.6%) | 75 (10.0%) | 191 (9.8%) | .271 |
| Race, n (%) | | | | | |
| White | 61 (10.8%) | 78 (12.1%) | 79 (10.7%) | 218 (11.2%) | .738 |
| African American | 418 (74.0%) | 495 (76.5%) | 524 (71.1%) | 1437 (73.7%) | .644 |
| Asian | 5 (0.9%) | 1 (0.2%) | 4 (0.5%) | 10 (0.5%) | .059 |
| Other | 26 (4.6%) | 19 (2.9%) | 35 (4.7%) | 80 (4.1%) | .206 |
| Unknown | 55 (9.7%) | 54 (8.3%) | 95 (12.9%) | 204 (10.5%) | .012 |
| ISS, median (Q1, Q3) | 10 (6, 21) | 10 (5, 22) | 10 (6, 19) | 10 (5, 21) | .721 |
| TRISS, median (Q1, Q3) | 0.99 (0.93, 0.99) | 0.99 (0.96, 0.99) | 0.99 (0.96, 0.99) | 0.99 (0.96, 0.99) | .501 |
| Comorbidities, n (%) | | | | | |
| Mental/Personality disorder | 34 (6.0%) | 39 (6.0%) | 35 (4.7%) | 108 (5.5%) | .491 |
| Chronic alcohol use | 15 (2.6%) | 12 (1.8%) | 8 (1.1%) | 31 (1.6%) | .111 |
| Substance abuse disorder | 55 (9.7%) | 34 (5.2%) | 71 (9.6%) | 160 (8.2%) | .003 |
| Admission vitals, median (Q1, Q3) | | | | | |
| GCS | 15 (5, 15) | 15 (12, 15) | 15 (13, 15) | 15 (11, 15) | .461 |
| Heart rate | 89 (70, 110) | 91 (71, 110) | 91 (72, 109) | 90 (70, 110) | .341 |
| Systolic blood pressure | 124 (90, 148) | 122 (92, 146) | 122 (92, 141) | 122 (92, 144) | .831 |
| Alcohol level 0.08 +, n (%) | 54 (9.5%) | 78 (12.1%) | 52 (7.1%) | 184 (9.4%) | .005 |
| Positive drug screen, n (%) | 216 (38.2%) | 268 (41.4%) | 288 (39.1%) | 772 (39.6%) | .009 |
| Outcomes | | | | | |
| MTP activation, n (%) | 96 (17.0%) | 111 (17.2%) | 125 (16.9%) | 332 (17.0%) | .991 |
| ICU days, median (Q1, Q3) | 3 (1, 8) | 3 (1, 8) | 3 (1, 7) | 3 (1, 8) | .271 |
| Ventilator days, median (Q1, Q3) | 0 (0, 1) | 0 (0, 1) | 0 (0, 1) | 0 (0, 1) | .048 |
| Complications, n (%) | 95 (16.8%) | 107 (16.5%) | 103 (13.9%) | 305 (15.6%) | .281 |
| Discharge Destination, n (%) | | | | | |
| Home | 322 (57.0%) | 370 (57.2%) | 442 (59.9%) | 1,134 (58.2%) | .016 |
| Rehab/SNF/LTAC | 70 (12.4%) | 86 (13.3%) | 53 (7.2%) | 209 (10.7%) | |
| Transfer | 14 (2.5%) | 22 (3.4%) | 28 (3.8%) | 64 (3.3%) | |
| Mortality, n (%) | 125 (22.1%) | 128 (19.7%) | 160 (21.7%) | 413 (21.2%) | .551 |

ISS, injury severity score; TRISS, trauma injury severity score; GCS, Glasgow Coma Scale; MTP, massive transfusion protocol; ICU, intensive care unit; SNF, skilled nursing facility; LTAC, long-term acute care facility.

* P values are based on a 1-way ANOVA test for continuous variables. 
1 P values are based on chi-square tests for categorical variables.

Given the disproportionate impact of penetrating trauma on African American populations,22–25 we specifically examined rates of interpersonal violence in African Americans in our cohort to (P = 2.50), peaking in 2020 in June (n = 64, 2.2%) as compared with 2019 (peak in July, 42 [1.4%] SW) and 2018 (peak in May, 44 [1.6%] SW). Assault-related injuries were less common in urban counties of PA in 2020. The highest number of assault related admissions was 140 (4.9%) in June 2020, compared with 168 (5.8%) in July 2019 and 167 (6.0%) in May 2018 (P <.059). There was no clear association between incidence of COVID-19 infection and interpersonal violence (Fig 2).

**GSW characteristics and outcomes**

A total of 1,949 admissions with GSW were identified across the time periods with 565 in the 2018 group, 647 in the 2019 group, and 737 in the COVID-era group. Demographics and injury characteristics were similar among the 3 time periods, as shown in Table I. Outcomes after GSW were similar across time periods, including length of stay and complications. The majority of the patients in all 3 time periods were discharged home (P = .016), and no significant differences in mortality was observed (P = .55).

**SW characteristics and outcomes**

There was a total of 667 admissions with SW, including 215 in 2018, 196 in 2019, and 256 patients in the COVID era. Patients injured during the COVID era had a significantly higher ISS (9 vs 5 in 2018 and 6 in 2019, P <.0001), as shown in Table II. There were significantly higher numbers of patients with positive drug screens in the COVID era compared with the 2018 and 2019 groups (52.3% vs 33.9% vs 45.9%, COVID era vs 2018 vs 2019, respectively P = .0001). The majority of patients with SW were discharged home (P = .024). No differences in mortality were observed across the 3 groups.

**Assault characteristics and outcomes**

A total of 2,419 admissions involved blunt assault-related injuries. There were 660 admissions in the COVID era, 903 in the 2018 group, and 856 in the 2019 group. Caucasian males comprised the majority of the assaulted population (35%), and characteristics were similar across time periods, as shown in Table III. There were no significant differences in injury severity as measured by ISS and TRISS across the 3 groups. Similarly, a significantly higher incidence of substance abuse disorders (21.8% vs 17.6% vs 11.3%, COVID era vs 2018 vs 2019, respectively, P < .0001) and chronic alcohol abuse (11.8% vs 9.7% vs 7.4%, COVID era vs 2018 vs 2019, respectively, P = .012) was prevalent among patients in the COVID era compared with the 2018 and 2019 groups. A significantly higher number of patients with positive drug screens were also found in the COVID era compared with the 2018 and 2019 groups (41.4% vs 33.1% vs 33.5%, P < .0001). Outcomes were similar across all 3 time periods.

**Racial disparities in incidence of GSWs**

Given the disproportionate impact of penetrating trauma on African American populations,22–25 we specifically examined rates of interpersonal violence in African Americans in our cohort to
African Americans and men were at highest risk of GSW injuries. Mortality was demonstrated during all time periods examined, and outcomes were similar across the years studied. An equivalent risk of incidence of SW was stable, but the severity was higher in 2020. For the seasonal variations in the epidemiology of trauma, the mechanisms of these outcomes are closely associated with presenting physiology, degree of injury, and transfer status. Multivariable analysis showed equivalent risk of violence died. Multivariable analysis showed equivalent risk of death in the 3 time periods studied. Risk of mortality was most closely associated with presenting physiology, degree of injury, and transfer status.

**Discussion**

In this statewide study of interpersonal violence in PA, we identified an increase in GSW injuries and a decrease in blunt assaults. We compared equivalent time periods in 3 years to account for the seasonal variations in the epidemiology of trauma. The incidence of SW was stable, but the severity was higher in 2020. Overall, patient and injury characteristics, interventions, and outcomes were similar across the years studied. An equivalent risk of mortality was demonstrated during all time periods examined, which is consistent with previous reports.8–12 In each time period, African Americans and men were at highest risk of GSW injuries. GSW injury rates per 100,000 population was significantly higher in the African American population when compared with the Asian and Caucasian populations, further signifying racial disparities of GSW injuries in the African American population in the state of PA. Geospatial analysis did not identify any relationship between county-level incidence of COVID-19 and violent injury, suggesting that the cause of rising violence may be less the pandemic itself than the associated policies and stresses. Our data also suggest that circumstances surrounding injuries were different during the pandemic than in prior years. We note, for example, a higher severity of SWs, increased substance use among assault patients, and less alcohol use among SW and blunt assault patients during the pandemic, despite evidence suggesting increases in alcohol consumption in the population at large.16,27 The mechanisms of these differences are unknown but are likely related to decreases in large social gatherings including social drinking.

Our results corroborate reports from around the country that have identified a rising incidence of interpersonal violence during the pandemic.10,27–29 Single-center studies by Sherman et al30 and Rhodes et al16 demonstrated a higher volume of penetrating trauma during a SAH order and a shift in injury patterns. Cannon et al9 and Abdallah et al12 demonstrated a sharp rise in penetrating injuries in a level 1 academic trauma center in Philadelphia, PA. A recent study from southern California also demonstrated increased rates of penetrating injuries.13 The COVID-19 pandemic has led to numerous societal disruptions that may play a role in these findings. Many individuals were affected with financial strain.

### Table II

| Demographics | 2018 (n = 215) | 2019 (n = 196) | 2020 (n = 256) | Total (n = 667) | P value |
|--------------|---------------|---------------|---------------|----------------|---------|
| Age, median (Q1, Q3) | 32 (25,44) | 32 (25,54.25) | 34 (26,45) | 33 (26,44) | .16* |
| Sex, n (%) | 179 (83.3%) | 162 (82.6%) | 219 (85.5%) | 560 (84.0%) | .67* |
| Race, n (%) | 36 (16.7%) | 34 (17.3%) | 37 (14.4%) | 107 (15.7%) | .62* |
| White | 71 (33.0%) | 64 (32.6%) | 83 (32.4%) | 218 (32.7%) | .07 |
| African American | 115 (53.5%) | 109 (55.6%) | 127 (49.6%) | 351 (52.6%) | .17 |
| Asian | 1 (0.4%) | 3 (1.5%) | 1 (0.4%) | 5 (0.7%) | .07 |
| Other | 12 (5.6%) | 6 (3.1%) | 8 (3.1%) | 23 (3.4%) | .07 |
| Unknown | 16 (7.4%) | 14 (7.1%) | 36 (14.4%) | 67 (10.0%) | .07 |
| ISS, median (Q1, Q3) | 5 (1, 10) | 6 (2.5, 10) | 9 (4, 13.5) | 5 (2, 10) | .0001* |
| TRISS, median (Q1, Q3) | 0.99 (0.99, 0.99) | 0.99 (0.98, 0.99) | 0.99 (0.98, 0.99) | 0.99 (0.98, 0.99) | .003* |
| Comorbidities, n (%) | 42 (19.5%) | 28 (14.1%) | 45 (17.6%) | 115 (17.2%) | .36 |
| Mental/Personality disorder | 64 (29.8%) | 57 (29.1%) | 105 (41.0%) | 226 (33.9%) | .011* |
| Chronic alcohol use | 13 (6.0%) | 8 (4.1%) | 19 (7.4%) | 40 (6.0%) | .33 |
| Substance abuse disorder | 35 (16.3%) | 25 (12.8%) | 53 (20.7%) | 113 (16.9%) | .07 |
| Admission vital, median (Q1, Q3) | 15 (15, 15) | 15 (14, 15) | 15 (15, 15) | 15 (15, 15) | .005* |
| GCS | 95 (80, 108) | 98 (86, 114) | 96 (83, 111) | 97 (83,111.5) | .50 |
| Systolic blood pressure | 130 (115, 144) | 130 (110,144) | 125.5 (110,140.5) | 128 (110, 142) | .50 |
| Alcohol level 0.08+, n (%) | 54 (25.1%) | 53 (27.0%) | 61 (23.8%) | 168 (25.2%) | .09 |
| Positive drug screen, n (%) | 73 (33.9%) | 90 (45.9%) | 134 (52.7%) | 297 (44.5%) | .0001 |
| Outcomes | 13 (6.0%) | 22 (11.2%) | 23 (9.0%) | 58 (8.7%) | .17 |
| Hospital days, median (Q1, Q3) | 7 (3.2%) | 4 (2.4%) | 6 (2.8%) | 17 (2.2%) | .003* |
| Complications, n (%) | 175 (81.4%) | 150 (76.5%) | 207 (80.9%) | 532 (79.8%) | .024 |
| Discharge destination, n (%) | 10 (4.6%) | 10 (5.1%) | 3 (1.2%) | 23 (3.4%) | .07 |
| Mortality, n (%) | 10 (4.6%) | 12 (6.1%) | 5 (2.0%) | 27 (4.0%) | .07 |

**Note:** ISS, injury severity score; TRISS, trauma injury severity score; GCS, Glasgow Coma Scale; MTP, massive transfusion protocol; ICU, intensive care unit; SNF, skilled nursing facility; LTAC, long-term acute care facility.

* P values are based on a 1-way ANOVA test for continuous variables.

1 P values are based on chi-square tests for categorical variables.
particularly those already living on the margins.\textsuperscript{31} School closures left children and students without access to a structured, supervised social and academic environment.\textsuperscript{32–34} Surges in COVID-19 prompted public health measures and healthcare systems to allocate resources to the care of patients affected by SARS-CoV-2 and away from other medical conditions,\textsuperscript{35} including mental health services, drug rehabilitation programs, and injury prevention. These findings must inform our responses not only to this pandemic, but to future disasters, natural and manmade.

### Study limitations

There were a number of limitations to this study, including the potential for miscoding or misregistering of data. Clinical granularity was limited regarding treatment, progress, and services provided to patients. The PTOS registry only includes patients meeting prespecified criteria who are treated at trauma centers. We cannot account for minor injuries that resulted in ED discharge or for patients treated at other hospitals. We suspect that circumstances leading to injury were different during the pandemic compared with prior years, but we have no data on these circumstances, or on the assailants involved in these violent injuries. We identified positive drug and alcohol screens, but not all patients were screened. Further, we used the time period of March 16 to July 31 owing to the availability of completed records from PTOS and cannot account for the impact of the second wave of the pandemic or further policy changes. The associated rise in the incidence of interpersonal violence incidences in the setting of COVID-19 should further be examined with data from post-COVID-19 years, to examine a true causal relationship. We assessed clinical outcomes of the population during the study periods yearly rather than monthly, to enhance our assessment of outcomes in detail.

In conclusion, the COVID-19 pandemic may have had unexpected and far-reaching effects on the incidence of interpersonal violence in the Commonwealth of PA. Geospatial varians and associations with social factors such as increased substance abuse suggest the opportunity for focused interventions. Ongoing

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### Table III

Demographics and outcomes of patients with blunt assault-related injuries from March 16 to July 31

| Demographics | 2018 (n = 903) | 2019 (n = 856) | 2020 (n = 660) | Total (n = 2419) | P value |
|--------------|---------------|---------------|---------------|-----------------|--------|
| Age, median (Q1, Q3) | 36 (25.51) | 38 (26.52) | 38 (29.53) | 37 (26.52) | .022 |
| Sex, n (%) | | | | | .62 |
| Male | 669 (74.1%) | 619 (72.3%) | 490 (74.2%) | 1778 (73.3%) | |
| Female | 234 (25.9%) | 237 (27.7%) | 170 (25.8%) | 641 (26.5%) | |
| Race, n (%) | | | | | .054 |
| White | 471 (52.2%) | 424 (49.5%) | 290 (43.9%) | 1185 (49.0%) | |
| African American | 319 (35.3%) | 319 (37.3%) | 261 (39.5%) | 899 (37.2%) | |
| Asian | 9 (1.0%) | 14 (1.6%) | 5 (0.8%) | 28 (1.2%) | |
| Other | 50 (5.3%) | 32 (3.7%) | 34 (5.1%) | 116 (4.8%) | |
| Unknown | 54 (6.0%) | 67 (7.8%) | 70 (10.6%) | 191 (7.8%) | |
| ISS, Median (Q1, Q3) | 6 (4, 10) | 6 (4, 11) | 5 (4, 10) | 6 (4, 10) | .33 |
| TRISS, Median (Q1, Q3) | 0.99 (0.98, 1.00) | 0.99 (0.98, 1.00) | 0.99 (0.98, 1.00) | 0.99 (0.98, 1.00) | .78 |
| Comorbidities, n (%) | | | | | |
| Mental/Personality disorder | 246 (27.2%) | 188 (22.0%) | 157 (23.8%) | 591 (24.4%) | .032 |
| Current tobacco use | 376 (41.6%) | 376 (43.9%) | 305 (46.2%) | 1057 (43.7%) | .19 |
| Chronic alcohol use | 88 (9.7%) | 63 (7.4%) | 78 (11.8%) | 239 (9.5%) | .012 |
| Substance abuse disorder | 159 (17.6%) | 97 (11.3%) | 144 (21.8%) | 400 (16.5%) | <.0001 |
| Admission vitals, median (Q1, Q3) | | | | | |
| GCS | 15 (15, 15) | 15 (15, 15) | 15 (15, 15) | 15 (15, 15) | .63 |
| Heart rate | 88 (77, 104) | 89 (76, 104) | 89 (77, 104) | 89 (76, 104) | .47 |
| Systolic blood pressure | 134 (121, 150) | 133 (119, 148) | 132 (120, 146) | 133 (120, 148) | .11 |
| Alcohol level 0.08, n (%) | 199 (22.0%) | 167 (19.5%) | 109 (16.5%) | 475 (19.6%) | .0003 |
| Mortality, n (%) | 53 (5.9%) | 41 (4.8%) | 36 (5.4%) | 130 (5.4%) | .60 |
| Complications, n (%) | 53 (5.9%) | 41 (4.8%) | 36 (5.4%) | 130 (5.4%) | .60 |
| Discharge Destination, n (%) | | | | | .026 |
| Home | 620 (68.7%) | 576 (67.3%) | 451 (68.3%) | 1647 (68.1%) | |
| Rehab/SNF/LTAC | 78 (8.6%) | 79 (9.2%) | 59 (8.9%) | 216 (8.9%) | |
| Transfer | 42 (4.6%) | 64 (7.5%) | 32 (4.8%) | 138 (5.7%) | |

* ISS, injury severity score; TRISS, trauma injury severity score; GCS, Glasgow Coma Scale; MTP, massive transfusion protocol; ICU, intensive care unit; SNF, skilled nursing facility; LTAC, long-term acute care facility.
* P values are based on a 1-way ANOVA test for continuous variables.
* P values are based on chi-square tests for categorical variables.
epidemiologic monitoring and psychosocial research and intervention is warranted.

Funding/Support

No specific funding was obtained for this study.

Conflict of interest/Disclosure

Dr Kaufman is supported by AHRQ 5K12 HS026372 03.

Acknowledgments

The authors would like to thank PTSF/PTOS staff and the research committee for the use of data and for contributions to the above publication.

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