## OBSERVATIONS: BRIEF RESEARCH REPORTS

### Mental Health and Health-Related Quality of Life After Firearm Injury: A Preliminary Descriptive Study

*Background:* Firearm injury is a public health crisis in the United States (1). Organizations have called for the consideration of long-term consequences of firearm violence, particularly for those directly impacted. Interpersonal firearm violence survivors report significantly worse physical health and functioning compared with the general population and other mechanisms of traumatic injury (1). Furthermore, firearm violence impacts the mental health of survivors and communities. Yet, there is limited work examining self-reported mental and physical health consequences of firearm violence for survivors acutely after injury, thwarting health care systems' ability to comprehensively intervene.

*Objective:* To describe the mental health symptoms and health-related quality of life of firearm injury survivors 6 months after injury.

*Methods:* A convenience sample of 87 adults was recruited from the trauma service of a level 1 trauma center in a midwestern, mid-sized city. Data were pooled from 2 studies occurring at the same center between the years of 2014 to 2016 and 2017 to 2021; both studies examined psychological and biological outcomes of traumatic injury (2). Participants were recruited in the emergency department or during hospitalization. Inclusion criteria were: 1) being 18 years of age or older, 2) having a Glasgow Coma Scale score of at least 13 on arrival, 3) having an unintentional suicidal self-injury, and 4) communicating in English. Exclusion criteria were: 1) experiencing loss of consciousness greater than 30 minutes, 2) experiencing posttraumatic amnesia for more than 24 hours, or 3) being in police custody. Although both studies recruited participants with all mechanisms of injury, the current investigation presents data on patients with interpersonal firearm-related injuries. Baseline sessions occurred up to 1 month postinjury and follow-up approximately 6 months after injury. After consent, participants completed measures on posttraumatic stress disorder (PTSD; PTSD Symptom Checklist for DSM-5); depression, anxiety, and stress (Depression, Anxiety, and Stress Scale [DASS-21]); and physical health-related quality of life (Short Form 12). Studies were approved by the Medical College of Wisconsin institutional review board and were funded by the National Institute of Mental Health. The funding organization was not involved in study design, data collection, or analyses.

*Findings:* The Table provides demographic characteristics and outcome variables at baseline and 6 months. At baseline, patients exhibited symptoms of PTSD with a mean score of 27.15 (SD, 19.19), but symptoms were more severe at 6 months at a mean score of 38.66 (SD, 19.91). The PTSD mean score was above the recommended diagnostic cutoff of 34 for PTSD after interpersonal trauma and was higher than previous injury samples (3). Using interpretation guidelines from DASS-21, anxiety was "mild" at baseline with a mean score of 9.28 (SD, 9.23) and "moderate" at 6 months with a mean score of 11.20 (SD, 11.17). Depressive symptoms were in the "normal" range at baseline with a mean score of 7.25 (SD, 8.91), and higher at 6 months, nearing the cutoff to mild range at a mean score of 9.56 (SD, 10.87). Patients reported normal stress levels at a mean score of 9.52 (SD, 9.31) at baseline. Although reported stress was higher at 6 months with a mean score of 12.93 (SD, 11.29), it was still within the normal range. Patients' health-related quality of life was poor at baseline at a mean score of 30.48 (SD, 13.94), remained poor at 6 months with a mean score of 30.45 (SD, 19.22), and was well below scores reported in previous studies of both injury populations and the general population (4). The Figure shows changes in outcome measures from baseline to 6 months.

*Discussion:* The need to understand the physical and mental health consequences of firearm injury in the United States is vital. In this preliminary descriptive study, firearm injury survivors reported poor PTSD acutely after the injury that persisted at 6 months. Furthermore, these patients endorse poor physical health–related quality of life across time, with values worse than previously studied injury samples (4). Medical advancements have increased the survivability of firearm injury, though survivors still carry the burden of injury as the mental and physical health outcomes seem poorer relative to the general population and those who have sustained other traumatic injuries (1, 4). These findings must be considered within the context of limitations including the small convenience sample, relatively short follow-up, and lack of data on preinjury mental health comorbidity. However, this preliminary study highlights the needs to better understand and manage the mental health consequences of firearm injury. Early screening and comprehensive care may improve outcomes in this at-risk population.

***Table.*** Sample Demographics, and Mental Health and Health-Related Quality-of-Life Descriptive Statistics

| Characteristic | Descriptive Statistic | Range |
|---|---|---|
| **Sex, *n (%)*** | | |
| Female | 77 (88.5) | – |
| Male | 10 (11.5) | – |
| **Race, *n (%)*** | | |
| Asian | 1 (1.1) | – |
| Black/African American | 69 (79.3) | – |
| Hispanic/Latinx | 11 (12.6) | – |
| White/European American | 6 (6.9) | – |
| **Psychiatric history,* *n (%)*** | | |
| Yes | 36 (41.4) | – |
| No | 50 (57.5) | – |
| **Mean age (SD), *y*** | 32.96 (10.06) | 18–57 |
| **Mean Injury Severity Score (SD)** | 13.12 (8.49) | 1–43 |
| **Mean PCL-5–PTSD score† (SD)** | | |
| Baseline (*n* = 87) | 27.15 (19.19) | 1–72 |
| 6 mo (*n* = 41) | 38.66 (19.91) | 2–73 |
| **Mean DASS-21–Anxiety score† (SD)** | | |
| Baseline (*n* = 87) | 9.29 (9.23) | 0–42 |
| 6 mo (*n* = 41) | 11.20 (11.17) | 0–42 |
| **Mean DASS-21–Depression score† (SD)** | | |
| Baseline (*n* = 87) | 7.25 (8.91) | 0–42 |
| 6 mo (*n* = 41) | 9.56 (10.87) | 0–42 |
| **Mean DASS-21–Stress score† (SD)** | | |
| Baseline (*n* = 87) | 9.52 (9.31) | 0–38 |
| 6 mo (*n* = 41) | 12.93 (11.29) | 0–42 |
| **Mean SF-12 Physical Health score‡ (SD)** | | |
| Baseline (*n* = 87) | 30.48 (13.94) | 5.17–55.48 |
| 6 mo (*n* = 41) | 30.45 (19.22) | 0–60.73 |

DASS-21 = Depression, Anxiety, Stress Scale; PCL-5 = PTSD Checklist for DSM-5, measure of PTSD symptom severity; PTSD = posttraumatic stress disorder; SF-12 = Short Form 12, for physical health.

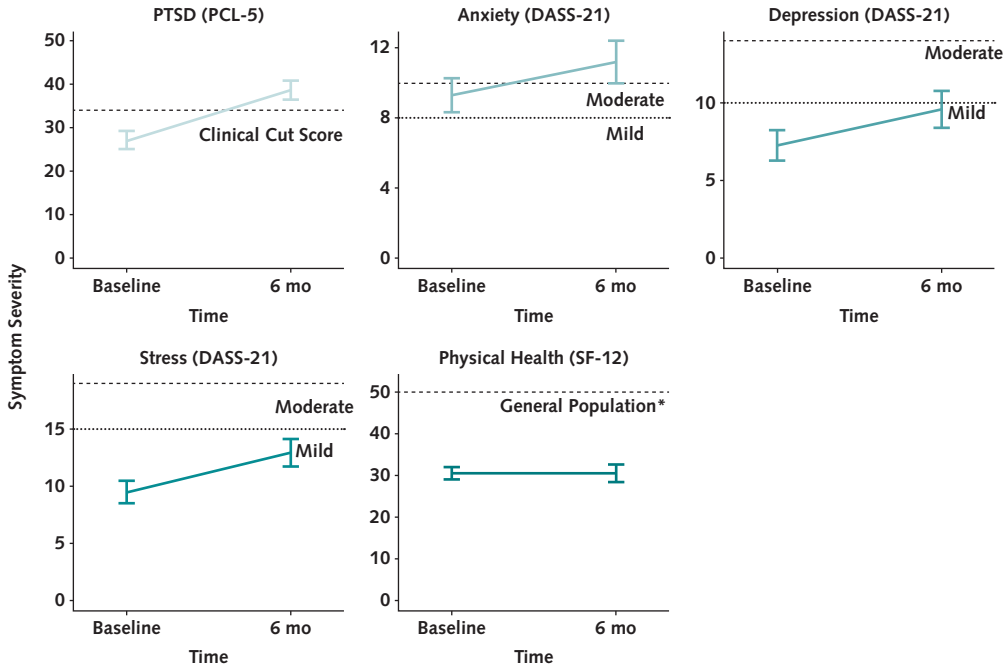
* One participant declined to answer.

† Higher scores are indicative of worse symptoms for PTSD, Depression, Anxiety, and Stress.

‡ Lower scores are indicative of poorer health for Physical Health.

***Figure.*** Mental and physical health outcome variables across time.




Error bars depict SE. DASS-21 = Depression, Anxiety, and Stress Scale; PCL-5 = PTSD Checklist for DSM-5, measure of PTSD symptom severity; PTSD = posttraumatic stress disorder; SF-12 = Short Form 12, for physical health.
* Lower SF-12 scores correspond to poorer health. General population average from Haider et al (4).

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**Reproducible Research Statement:** *Study protocol:* The protocol is available from the senior author, Dr. deRoon-Cassini, on reasonable request (e-mail, tcassini@mcw.edu). *Statistical code:* Not applicable due to the study's descriptive nature. *Data set:* The data that support the findings of this study have been submitted and stored with NIMH in the Research Domain Criteria Database (RDoCdb) repository as a requirement of receiving funding and are available from the senior author, Dr. deRoon-Cassini, on reasonable request (e-mail, tcassini@mcw.edu).

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