Journal of Clinical and Translational Science

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Translational Design Studies

Cite this article: Testa A, Bluth EF, Monroe LS, Harris K, Li R, Heckler B, Yang Z, and McKay S. Pilot study findings of the Houston hospital-based violence intervention program. *Journal of Clinical and Translational Science* **10**: e160, 1–6. doi: 10.1017/cts.2026.10824

Received: 9 January 2026 UTC
Revised: 21 July 2026 UTC
Accepted: 10 August 2026 UTC

Keywords:
firearm; violence; hospital; hospital-based violence intervention program; clinical trial

Corresponding author:
S. McKay; Email: sm187@rice.edu

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Pilot study findings of the Houston hospital-based violence intervention program

Alexander Testa[1], Eresha F. Bluth[2], Latanya S. Monroe[2], Karlton Harris[3], Ruosha Li[4], Brian Heckler[4], Zixi Yang[4] and Sandra McKay[2,5]

[1]The University of Texas Health Science Center at Houston School of Public Health, Houston, TX, USA; [2]Department of Pediatrics, McGovern Medical School at UTHealth Houston, Houston, TX, USA; [3]The Forgotten Third Inc., Houston, TX, USA; [4]Biostatistics and Data Science, The University of Texas Health Science Center at Houston, Houston, TX, USA and [5]Baker Institute for Public Policy, Rice University, Houston, TX, USA

Abstract

This study reports findings from the pilot phase of the Houston hospital-based violence intervention program (HVIP). Between January and March 2025, 15 gunshot wound patients aged 16–35 years were enrolled and randomized to receive either intensive three-month case management or usual care. Participants had high socioeconomic vulnerability, and moderate levels of PTSD symptoms and attitudes toward guns and violence. The pilot study achieved an 85.7% follow-up rate, demonstrating the feasibility of enrolling and retaining this population. Findings lay the groundwork for a full randomized controlled trial to evaluate the effectiveness of the HVIP in reducing reinjury and improving health outcomes.

Introduction

A gunshot wound (GSW) victim arrives at a hospital every 30 minutes in the United States[1], generating median hospital charges of over $53,000 per case[2]. GSW survivors face enduring physical impairments, psychological trauma, disruption to social and economic stability[3], and remain at elevated risk of violent reinjury[4]. Hospital-based violence intervention programs (HVIPs) are a strategy to support GSW victims[5–7]. To support GSW survivors, HVIPs leverage the "teachable moment" of hospitalization to engage patients who experienced a violent injury and provide intensive case management, linkages to community services, and support targeting social and behavioral risk factors for violence[5–8]. Emerging evidence suggests HVIPs can reduce reinjury[5,7,9], yet adequately powered randomized controlled trials (RCTs)[9], and studies of whether HVIPs impact health and social outcomes beyond violence recidivism are needed[10].

This study presents pilot-phase findings from the Houston-HVIP[11], focusing on recruitment and retention metrics and baseline survey outcomes. Beyond establishing feasibility for a full-scale trial, the pilot also informs the design of HVIP studies by addressing whether patients hospitalized for GSWs can be enrolled, randomized, and retained in a trial in which treatment arms are differentiated primarily by the dosage and directness of case management, while an enhanced usual-care control preserves an ethically adequate standard of care.

Patients and methods

The pilot study recruitment period spanned from January 13 to March 14, 2025, at Memorial Hermann Hospital-Texas Medical Center (MHH-TMC). The study protocol was approved by the University of Texas Health Science Center at Houston Committee on the Protection of Human Subjects and Memorial Hermann Research Committee (#HSC-MS-23-0904) and registered at ClinicalTrials.gov (NCT06263647). Eligibility was defined as: (1) presentation to MHH-TMC with a GSW from community-based or intimate partner violence; (2) age 16–35 years; (3) English-speaking (limited to English during the pilot phase while Spanish study materials were finalized); and (4) residence in Harris County, Texas. Exclusion criteria included: (1) self-inflicted GSWs or unintentional GSWs; (2) being in police custody during hospitalization; (3) primary residence outside Harris County; and (4) inability to provide informed consent due to psychological or developmental impairments. Participants were compensated $50 for each survey completed.

Recruitment

GSW patients were identified in the hospital electronic medical records (EMR), and eligibility was confirmed via a bedside four-item screener by a case manager (Appendix A). Case managers reviewed the informed consent form with participants and obtained written consent. For patients discharged before bedside engagement, case managers made up to 8 follow-up phone

calls within 2 weeks using contact information from the EMR. Enrollment was permitted up to one-month post-discharge. Randomization was implemented in REDCap using a 1:1 allocation ratio and permuted blocks of varying sizes[12].

Intervention and control conditions

Participants randomized to the treatment arm received the Houston-HVIP intervention, a three-month, intensive case management program designed as a "high-touch" model of care[13]. Following randomization, case managers conducted an initial assessment of participants' social needs and risk factors for violent reinjury, which informed the development of individualized case management plans. These plans emphasized frequent, sustained engagement, with case managers meeting with participants weekly for 30 minutes or more. Case managers referred participants to community-based services tailored to their immediate needs (e.g., job training, housing assistance, nutritional support, financial resources) and provided counseling on key social determinants of violence (e.g., conflict resolution, anger management). Participants assigned to the control condition received a "light-touch" intervention conceptualized as enhanced usual care[14]. At discharge, they were provided with a list of community resources addressing social and economic needs. Case managers made up to three follow-up contact attempts within two weeks post-discharge to help participants navigate services. Contacts were initiated by phone, with follow-up via text and email if calls went unanswered. Participants were blinded to the treatment versus control conditions. For additional information, please refer to the study protocol[11].

Developed in part through consultation with a community advisory board[15], the study design framed the control condition as an enhanced standard of care, providing services beyond what the hospital currently offers GSW patients, to ensure all enrolled patients received an ethically adequate level of care. While the high-touch and light-touch conditions are intensive relative to some prior HVIP evaluations[7,9], the design nonetheless differentiates the two arms primarily through the dosage and directness of case management.

Data

At enrollment, participants completed a baseline survey measuring sociodemographic and health domains (see Appendix B). See Appendix C for a list of questions and response options.

Outcomes

Firearm violence

Exposure to firearm violence was assessed using self-reported data from a survey instrument adapted from the Conflict Tactics Scales, Revised (CTS2)[16]. At baseline, participants were asked: In the past 3 months, including today, how often did the following occur?

a. A friend, neighbor, co-worker, or stranger threatened me with a gun or used/fired a gun on me.
b. My partner threatened me with a gun or used/fired a gun on me.
c. I threatened a friend, neighbor, co-worker, or stranger with a gun or used/fired a gun at them.
d. I threatened my partner with a gun or used/fired a gun at them.

Responses were coded as *never* (0), *once* (1), or *more than once* (2). Items were summed to create a single firearm violence scale, with higher scores indicating greater exposure.

Non-firearm victimization

Non-firearm victimization was measured using CTS2 items, focusing on violence involving physical force or weapons other than firearms. Using the same 3-month reference period and response options, participants reported whether they experienced:

a. My partner pushed, shoved, or slapped me.
b. My partner kicked, punched, beat me up, or threatened/used a knife or sharp object on me.
c. A friend, neighbor, co-worker, or stranger pushed, shoved, or slapped me.
d. A friend, neighbor, co-worker, or stranger kicked, punched, beat me up, or threatened/used a knife or sharp object on me.

Responses (0 = never, 1 = once, 2 = more than once) were summed to create a non-firearm victimization scale.

Attitudes toward guns and violence

Attitudes toward guns and violence were assessed with six items capturing beliefs about the acceptability and utility of firearms in conflict situations[17]. Each item used a 4-point Likert scale (0 = *strongly disagree* to 3 = *strongly agree*). Responses to the items below were summed into a single scale:

a. It is okay to shoot a person if that is what it takes to get something you want
b. It is okay to use a gun to shoot someone who insults or hurts you.
c. Carrying a gun makes you feel powerful/potent.
d. Carrying a gun makes you safer.
e. It is okay to carry a gun if you live in a rough neighborhood.
f. It is okay to use a gun to threaten someone who disrespects you.

Post-traumatic stress disorder symptoms (PTSD)

PTSD symptoms were assessed using the two-item Post-Traumatic Stress Disorder Checklist, Version 2 (PCL-2)[18]. Participants were asked how much, in the past month, they were bothered by:

a. Repeated, disturbing, and unwanted memories of the stressful experience.
b. Feeling very upset when something reminded you of the stressful experience.

Each item was rated from *not at all* (0) to *extremely* (3). Responses were summed to create a total PTSD symptom score.

Aggression

Aggression was measured using three items from the Copeland-Linder Scale[19]. Participants rated their agreement on a 4-point scale (strongly disagree = 0 to strongly agree = 3):

a. I believe that if someone hits you, you should hit them back.
b. I believe revenge is a good thing.
c. I believe it is okay to hurt people if they hurt you first.

Scores were summed to produce a single aggression scale, with higher scores reflecting greater endorsement of aggressive beliefs.

https://doi.org/10.1017/cts.2026.10824 Published online by Cambridge University Press

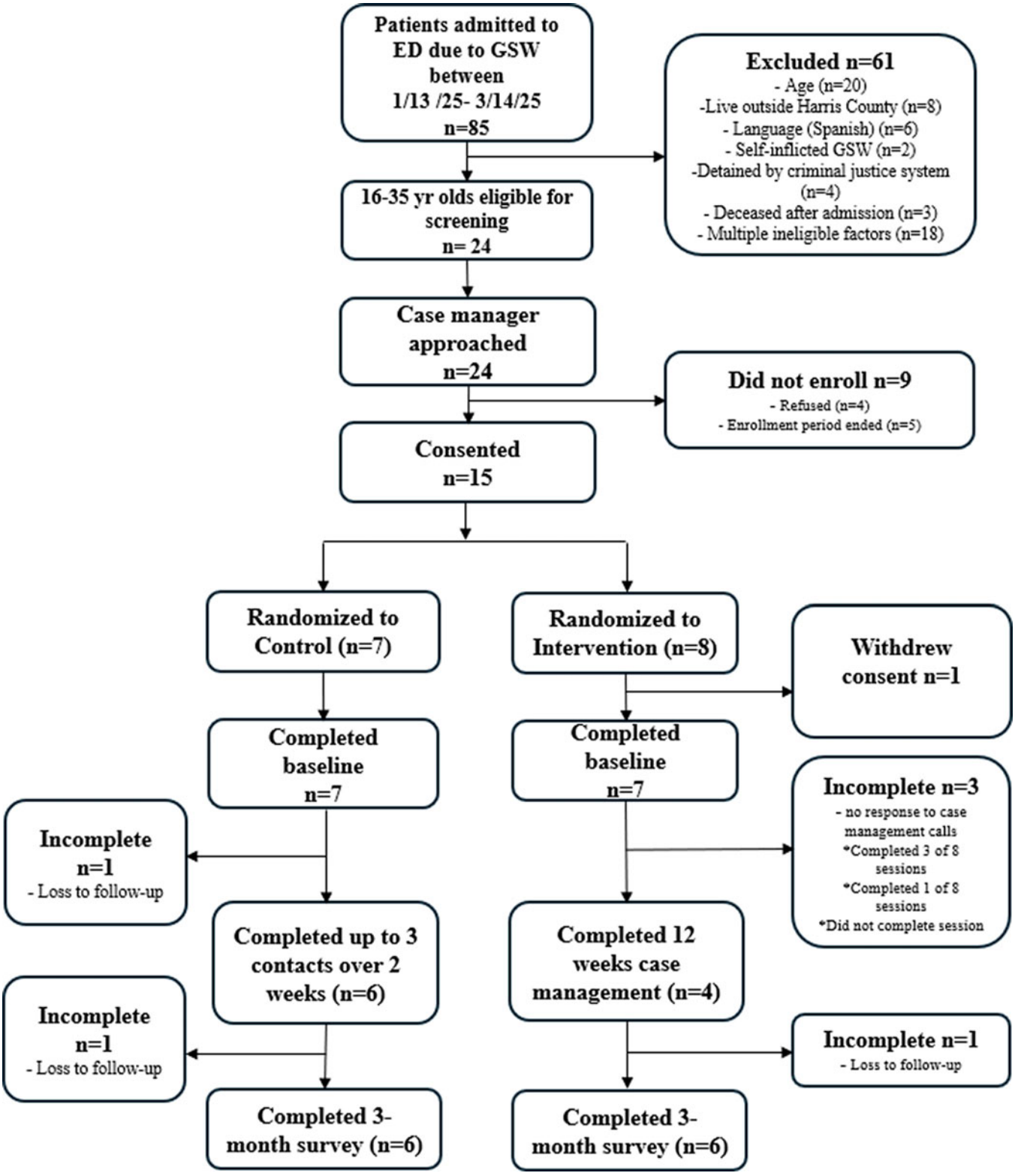


Figure 1. Pilot study consort diagram.

Self-rated health

Self-rated health was measured using a single survey item that asked respondents, "In general, would you say your health is?" with response options of poor, fair, good, very good, and excellent.

Results

Figure 1 provides the Consort Diagram. During the recruitment period (January 13 to March 14, 2025), 85 patients with GSWs were screened for eligibility; 24 met the inclusion criteria, and 61

https://doi.org/10.1017/cts.2026.10824 Published online by Cambridge University Press

Table 1. Sociodemographic profile of sample

Variables	Intervention ($N = 7$) *n* (%)	Control ($N = 7$) *n* (%)	Total ($N = 14$) *n* (%)
Age group			
17–20 years	1 (14.3)	2 (28.6)	3 (21.4)
21–25 years	1 (14.3)	2 (28.6)	3 (21.4)
26–30 years	4 (57.1)	2 (28.6)	6 (42.9)
31+ years	1 (14.3)	1 (14.3)	2 (14.3)
Race/ethnicity			
Hispanic	5 (71.4)	2 (28.6)	7 (50.0)
Non-Hispanic Black	1 (14.3)	5 (71.4)	6 (42.9)
Non-Hispanic White	1 (14.3)	0 (0.0)	1 (7.1)
Sex			
Female	0 (0.0)	2 (28.6)	2 (14.3)
Male	7 (100.0)	5 (71.4)	12 (85.7)
Education level			
High school/GED	3 (42.9)	4 (57.1)	7 (50.0)
Less than high school	2 (28.6)	2 (28.6)	4 (28.6)
More than high school	2 (28.6)	1 (14.3)	3 (21.4)
Job category			
Employed	3 (42.9)	2 (28.6)	5 (35.7)
Not working/ unemployed	4 (57.1)	3 (42.9)	7 (50.0)
Other	0 (0.0)	1 (14.3)	1 (7.1)
Student	0 (0.0)	1 (14.3)	1 (7.1)
Income category			
No income	2 (28.6)	1 (14.3)	3 (21.4)
<$24,000	1 (14.3)	3 (42.9)	4 (28.6)
$24,000–<$60,000	1 (14.3)	1 (14.3)	2 (14.3)
≥$60,000	2 (28.6)	0 (0.0)	2 (14.3)
Prefer not to answer	1 (14.3)	2 (28.6)	3 (21.4)
Relationship category			
Dating	2 (28.6)	2 (28.6)	4 (28.6)
Long-term partnership	3 (42.9)	0 (0.0)	3 (21.4)
Single	2 (28.6)	5 (71.4)	7 (50.0)
Presence of children under 18			
Has children under 18	4 (57.1)	5 (71.4)	9 (64.3)
No children under 18	3 (42.9)	2 (28.6)	5 (35.7)
Household size category			
1 person	1 (14.3)	1 (14.3)	2 (14.3)
2–3 people	1 (14.3)	2 (28.6)	3 (21.4)
4–5 people	4 (57.1)	3 (42.9)	7 (50.0)
6+ people	1 (14.3)	1 (14.3)	2 (14.3)

Table 2. Sociodemographic profile of sample

Variables	Intervention ($N = 7$) Mean (SD)	Control ($N = 7$) Mean (SD)	Total ($N = 14$) Mean (SD)
Firearm violence score [range = 0–2]	0.43 (0.79)	0.57 (0.98)	0.50 (0.85)
Non-firearm violence score [range = 0–4]	1.57 (1.81)	0.86 (1.21)	1.21 (1.53)
Aggression score [range = 1–8]	3.71 (2.29)	3.00 (1.41)	3.36 (1.86)
PTSD symptoms score [range = 0–6]	2.57 (2.76)	2.29 (1.50)	2.43 (2.14)
Attitudes toward guns and violence [range = 0–11]	5.57 (3.91)	5.14 (2.73)	5.36 (3.25)
Self-rated health	*n* (%)	*n* (%)	*n* (%)
Excellent	1 (14.3)	1 (14.3)	2 (14.3)
Very good	0 (0.0)	4 (57.1)	4 (28.6)
Good	3 (42.9)	2 (28.6)	5 (35.7)
Poor/fair	3 (42.9)	0 (0.0)	3 (21.4)

were excluded. Among eligible patients, 19 were approached, of whom 4 declined to participate and 15 enrolled (79% enrollment rate). An additional five potentially eligible patients were not approached because the pilot's enrollment capacity had been reached. One enrolled participant withdrew consent soon after enrolling, leaving 14 participants with completed baseline surveys. At the 3-month follow-up, 12 of the 14 participants (85.7%) completed the survey (6 in the control and 6 in the intervention group).

Table 1 provides an overview of the sample sociodemographic characteristics. The average age of participants was 25.6 (standard deviation [SD] = 4.9) years. The sample was 42.9% non-Hispanic Black, 50.0% Hispanic, and 7.1% non-Hispanic White, and the majority identified as male (85.7%). Regarding education, 50.0% had completed a high school diploma or GED, 28.6% had less than a high school education, and 21.4% had pursued education beyond high school. Half of the participants were unemployed at the time of enrollment. Annual household income was low: 50% reported earning less than $24,000, 14.3% between $24,000 and <$60,000, and 14.3% $60,000 or more. Regarding relationship status, 50.0% identified as single, 21.4% as being in a long-term unmarried partnership, and 28.6% as dating (see Table 1).

Levels of firearm violence exposure were generally low in the sample, with scores ranging from 0 to 2 and a mean score of 0.50. In contrast, exposure to non-firearm violence in the three months before the baseline survey was more commonly reported. Scores for non-firearm violence ranged from 0 to 4, with a mean of 1.21 (see Table 2). For details on the individual items for firearm and non-firearm violence, see Appendix D.

Participants reported moderate levels of aggression, with scores ranging from 1 to 8 (mean = 3.36). Symptoms of PTSD were moderately present, with scores ranging from 0 to 6 and an average

https://doi.org/10.1017/cts.2026.10824 Published online by Cambridge University Press

of 2.43. Attitudes towards guns and violence were also moderately elevated in this sample, ranging from 0 to 11, with a mean of 5.36. Self-rated health revealed variability across participants. Two individuals (14.3%) reported excellent health; four (28.6%) very good; five (35.7%) good; and three (21.4%) fair or poor.

Upon exiting the program, 12 respondents (6 from the control and 6 from the treatment) were asked to rate the services they received from the case manager on a scale of 0 (worst) to 10 (best)[20]. The average score of the intervention group was 9.17 (SD 1.17) compared to 7.17 (SD 3.54) for the control group (t-score = 1.31, $p = 0.219$).

Discussion

This pilot study demonstrated the feasibility of recruiting young adults hospitalized for GSW into an HVIP. Over a two-month recruitment window, nearly 80% of eligible patients approached consented to participate, and retention at three-month follow-up exceeded 85%. Despite relatively low firearm-related victimization in the immediate months before enrollment, participants reported notable exposure to non-firearm violence, moderate symptoms of post-traumatic stress, and levels of aggression, and attitudes toward guns and violence. These findings align with prior work demonstrating the substantial psychosocial burdens and unmet physical, mental, and social health needs (e.g., unemployment, low income) among GSW populations[21,22]. These barriers highlight the need for HVIPs to extend beyond clinical care and directly link participants to community-based resources that address structural and socioeconomic drivers of violence[6,10].

Limitations include a small sample size and a restriction to English-speaking participants. The short follow-up period does not capture longer-term retention or outcomes. Because participants in both arms may engage with other programs and community services in the broader violence intervention ecosystem, their risk trajectories may be shaped by exposures outside the HVIP. To address this, the study tracks the programs and services participants use throughout the follow-up period.

Conclusion

The results indicate that randomization to conditions differing in case-management dosage is practicable in a population experiencing GSW at a Level I trauma center. Randomization was balanced between arms, and participants in both arms rated case management services favorably. These findings provide insights into study design for future HVIP using an RCT and are foundational for the forthcoming Houston-HVIP evaluation[11].

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/cts.2026.10824.

Author contributions. **Alexander Testa**: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Visualization, Writing - original draft, Writing - review & editing; **Eresha F. Bluth**: Conceptualization, Project administration, Supervision, Writing - review & editing; **Latanya S. Monroe**: Investigation, Writing - review & editing; **Karlton Harris**: Investigation, Writing - review & editing; **Ruosha Li**: Conceptualization, Formal analysis, Investigation, Methodology, Writing - review & editing; **Brian Heckler**: Formal analysis, Investigation, Writing - review & editing; **Zixi Yang**: Formal analysis, Investigation, Writing - review & editing; **Sandra McKay**: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Writing - original draft, Writing - review & editing.

Funding statement. Research reported in this publication was supported by the National Institute of Nursing Research of the National Institutes of Health under Award Number UG3NR021232 and UH3NR021232. The content is solely the responsibility of the authors and does not necessarily represent the official view of the National Institutes of Health or any other federal agency.

Competing interests. The authors report no conflicts of interest.

References

1. **Rowh A, Zwald M, Sumner S, George N, Sheppard M, Holland K.** Firearm injury emergency department visits by month, day, and time during 2018 to 2023. *Ann Intern Med*. 2025;**178**:663–670. doi: 10.7326/ANNALS-24-02874.
2. **Miller T, Downing J, Wheeler L, Fischer K.** The medical costs of firearm injuries in the United States: a systematic review. *J Emerg Med*. 2024;**66**:109–132. doi: 10.1016/j.jemermed.2023.08.013.
3. **Vella MA, Warshauer A, Tortorello G, et al.** Long-term functional, psychological, emotional, and social outcomes in survivors of firearm injuries. *JAMA Surg*. 2020;**155**:1–9. doi: 10.1001/jamasurg.2019.4533.
4. **Pear VA, McCort CD, Kravitz-Wirtz N, Shev AB, Rowhani-Rahbar A, Wintemute GJ.** Risk factors for assaultive reinjury and death following a nonfatal firearm assault injury: a population-based retrospective cohort study. *Prev Med*. 2020;**139**:106198. doi: 10.1016/j.ypmed.2020.106198.
5. **Affinati S, Patton D, Hansen L, et al.** Hospital-based violence intervention programs targeting adult populations: An eastern association for the surgery of trauma evidence-based review. *Trauma Surg Acute Care Open*. 2016;**1**:e000024. doi: 10.1136/tsaco-2016-000024.
6. **Bonne S, Dicker RA.** Hospital-based violence intervention programs to address social determinants of health and violence. *Curr Trauma Rep*. 2020;**6**:23–28. doi: 10.1007/s40719-020-00184-9.
7. **Jay J, Pino E, Georges M, et al.** Effects of a hospital-based violence intervention program on community violence in Boston, Massachusetts. *Ann Intern Med*. 2026;**179**:372–381. doi: 10.7326/ANNALS-25-01678.
8. **The Health Alliance For Violence Intervention**. Hospital-based Violence Intervention Programs (HVIPs). The HAVI. (https://www.thehavi.org/what-is-an-hvip) Accessed March 12, 2025.
9. **Webster DW, Richardsonjr J, Meyerson N, Vil C, Topazian R.** Research on the effects of hospital-based violence intervention programs: observations and recommendations. *Ann Am Acad Pol Soc Sci*. 2022;**704**:137–157. doi: 10.1177/00027162231173323.
10. **Gorman E, Coles Z, Baker N, et al.** Beyond recidivism: hospital-based violence intervention and early health and social outcomes. *J Am Coll Surg*. 2022;**235**:927. doi: 10.1097/XCS.0000000000000409.
11. **Testa A, Bluth E, Monroe L, et al.** Protocol for the Houston Hospital-based violence intervention program. *PLOS One*. 2025;**20**:e0325569. doi: 10.1371/journal.pone.0325569.
12. **Harris PA, Taylor R, Minor BL, et al.** The REDCap consortium: building an international community of software platform partners. *J Biomed Inform*. 2019;**95**:103208. doi: 10.1016/j.jbi.2019.103208.
13. **Viswanathan M, Kennedy SM, Sathe N, et al.** Evaluating intensity, complexity, and potential for Causal inference in social needs interventions. *JAMA Netw Open*. 2024;**7**:e2417994. doi: 10.1001/jamanetworkopen.2024.17994.
14. **Neadley KE, Shoubridge C, Lynch JW, Boyd MA, Poirier BF.** Hospital-based interventions addressing social needs: a systematic narrative review. *Am J Prev Med*. 2025; **69**(1):107624. doi: 10.1016/j.amepre.2025.03.004.
15. **Thompson AMV, McKay S, Testa A, et al.** Framework, development, and creation of a community advisory board to guide the formation and oversee the implementation of the Houston Hospital-Based Violence Intervention Program. *J Clin Transl Sci*. 2025;**9**:e271. doi: 10.1017/cts.2025.10185.
16. **Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB.** The revised Conflict Tactics Scales (CTS2): development and preliminary

psychometric data. *J Fam Issues*. 1996;**17**:283–316. doi: 10.1177/019251396017003001.

17. **Shapiro JP, Dorman Rebekah L, Burkes William M, Welker Carolyn J, Clough JB.** Development and factor analysis of a measure of youth attitudes toward guns and violence. *J Clin Child Psychol*. 1997;**26**:311–320. doi: 10.1207/s15374424jccp2603_10.
18. **Lang AJ, Stein MB.** An abbreviated PTSD checklist for use as a screening instrument in primary care. *Behav Res Ther*. 2005;**43**:585–594. doi: 10.1016/j.brat.2004.04.005.
19. **Copeland-Linder N, Jones VC, Haynie DL, Simons-Morton BG, Wright JL, Cheng TL.** Factors associated with retaliatory attitudes among African American adolescents who have been assaulted. *J Pediatr Psychol*. 2007;**32**:760–770. doi: 10.1093/jpepsy/jsm007.
20. **Myers RK, Kapa HM, Garcia SM, Vega L, Fein JA.** Development of a brief client satisfaction and quality improvement tool for hospital-based violence intervention programs: opportunities for enhancing client perspectives. *J Patient Exp*. 2025;**12**:23743735251314622. doi: 10.1177/23743735251314622.
21. **Jang A, Thomas A, Slocum J, et al.** The gap between hospital-based violence intervention services and client needs: a systematic review. *Surgery* 2023;**174**:1008–1020. doi: 10.1016/j.surg.2023.07.011.
22. **Semenza DC, Baker NS, Ziminski D, Mastrocinque JM, Whye D, Heredia L.** Physical health challenges, healthcare needs, and barriers to care among firearm injury survivors: a mixed methods analysis. *J Urban Health*. 2026;**103**:55–65. doi: 10.1007/s11524-025-01049-9.

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