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Implementation of an Outpatient Violence Intervention Program to Increase Service Uptake

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Abstract
Challenges in participant recruitment and retention limit the effectiveness of hospital-based violence intervention programs (HVIPs). This study aimed to determine if an outpatient violence intervention program (VIP) could be integrated into a trauma clinic and increase uptake of violence prevention services. Patients previously hospitalized for intent-to-harm being seen for outpatient follow-up were eligible. VIP counselors met with participants during their clinic visit, administered the survey, and offered violence prevention services (April to June 2019). Patients were followed for 6 months to assess involvement. The primary outcome of interest was long-term participation in the VIP, defined as uptake of services at 6 months, in comparison to inpatient recruitment. Out of 76 patients, 34 (44.7%) did not appear for their appointment. The remainder ($n=42$) were offered participation in the study, of which 32 (76.2%) completed the survey. From the group offered VIP services, 57.1% expressed interest, and 5 (20.8%) ultimately took part yielding an overall participation rate of 11.9% at 6 months. The inpatient recruitment rate in 2019 was 2.4%. An outpatient VIP program can be integrated into a clinic setting but suffers from the same challenges faced by inpatient programs resulting in low rates of long-term participation in services. Although a high proportion of participants reported interest, actual engagement at 6 months was low. Reasons behind low participation in VIP services must be investigated.

Keywords Gun violence · Outpatient programs · Violence prevention · Hospital-based violence intervention

Background

When first introduced in the late 1990s, hospital-based violence intervention programs (HVIPs) were found to significantly reduce violence-related trauma recidivism (Cooper et al., 2006). HVIPs identify patients who have experienced a violent injury during their index hospitalization at which time they offer services to be provided after hospital discharge. These community-based services vary by trauma center but range from counseling and therapy to employment and relocation assistance. The goal is that by addressing risk factors that may have contributed to their exposure to violence at a time when the patient will be most receptive, i.e., the "teachable moment," the cycle of violence can be broken (Purtle et al., 2013).

Since then, HVIPs have proliferated across the country and a growing number of trauma centers devote a portion of their resources to funding this work. Organizations such as the Health Alliance for Violence Intervention (HAVI), also known as the National Network of Hospital-Based Violence Intervention Programs (NNHVIP), have developed toolkits and guidelines to help HVIPs in their mission. Increasing media and public attention on the issue of gun violence has fueled the growth of national and statewide funding of hospitals to tackle this important public health problem (Butkus et al., 2018).

Nonetheless, the effectiveness of HVIPs in reducing the rates of violence-related trauma recidivism has been variable across institutions (Affinati et al., 2016). One of the greatest challenges is recruitment and retention of participants, many of whom have unstable living conditions and competing

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priorities (St. Vil et al., 2018). A study of a single HVIP at San Francisco's only level 1 trauma center with 4,000 trauma activations per year recruited only 466 clients over a 10-year period (Juillard et al., 2016). Our own facility's HVIP recruitment rate was 2.4% of all violent admissions in 2019. There is a need for high-quality studies evaluating and addressing barriers to participation of violence victims in HVIPs.

The objective of this study was to determine the feasibility of an outpatient violence intervention program that supplements an existing inpatient HVIP in an outpatient, clinic setting. Secondary objectives were to assess the applicability of a risk survey (SaFETy score) and quantify program participation rates. Our purpose was to develop an outpatient program that increased recruitment of patients for the HVIP and participation in violence prevention services.

Methods

A prospective feasibility and evaluation study of an outpatient violence intervention program was performed at the R Adams Cowley Shock Trauma Center over 3 months (April to June 2019). All adult ($\geq$ 18 years) trauma patients already being seen at the outpatient clinic who had experienced intent-to-harm were identified and approached for inclusion in the study. All patients who were included had been hospitalized for their injury and subsequently discharged and were being seen for a scheduled follow-up clinic visit. Intent-to-harm was defined as an assault, stab wound, or gunshot wound that was intentionally inflicted on the victim by another individual. This study was approved for research by the Institutional Review Board of the University of Maryland Medical Center.

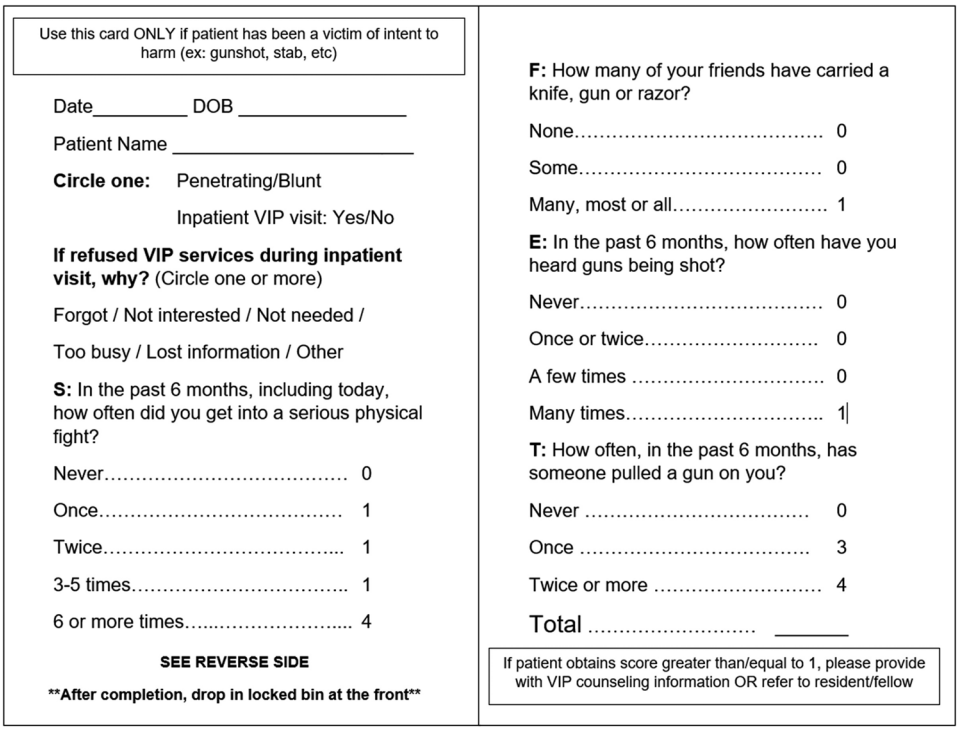
The University of Maryland R Adams Cowley Shock Trauma Center (UM-STC) is a state-verified level 1 trauma center that serves as a quaternary care center for the state of Maryland. Approximately 20% of the 7000 patients treated at UM-STC have experienced penetrating trauma. The Violence Intervention Program (VIP), a hospital-based violence intervention program at UM-STC, was developed by trauma surgeon Dr. Carnell Cooper in 1998 and is part of the Center for Injury Prevention and Policy (Cooper et al., 2006). It functions as an inpatient referral program during which credible messengers, counselors, and violence intervention specialists identify victims of violence during an index hospitalization and approach them at bedside to offer services. Services can range from outpatient counseling and psychotherapy to assistance with social services such as employment and relocation (Cooper et al., 2006). If participants need services not directly offered by the VIP, they are referred to community organizations. Credible messengers are recruited from the local community and have experienced violent injury themselves. Other VIP staff are recruited from employment listings and receive specialized training on trauma-informed care and the unique needs of victims of urban violence. There is no predefined script used by the VIP staff when engaging a patient, and the goal is for every victim of violence to be visited by a VIP counselor at least once prior to discharge. The VIP sees approximately 1000 inpatients per year and has 6 trained counselors.

Prior to study initiation, routine violence prevention services were not offered at the outpatient clinic and consisted only of sporadic visits based on clinician request. During the study period, VIP counselors were on-site for the entirety of all clinic sessions. The trauma clinic takes up half a day and is held three times a week. As part of the study, patients who fit the eligibility criteria were offered violence prevention services including counseling and administered a risk assessment known as the SaFETy survey (Fig. 1). The survey was administered verbally by a trained VIP counselor who recorded the results on the survey card and placed it in a locked box at the end of the clinic day. The intention for the survey was twofold: (1) to determine whether it could be used as a screening tool in the outpatient clinic and (2) assess its implementation in the routine flow of VIP services. Patients were given the option to opt out of participation in the survey.

Aside from a verbal offering of VIP services, patients were also given a brochure which included the VIP telephone number. In addition, counselors would call patients several weeks later to follow-up and re-extend the invitation for VIP services. Routinely collected data on participant demographics, employment status, and toxicology screen at the time of injury was obtained from retrospective chart review. The implementation process, survey results, and participation in services were recorded. Patients were followed for 6 months after completion of the study for participation in VIP services. The main outcome of interest was VIP participation at 6 months, which was defined as uptake of any type of service following initial recruitment within the follow-up period, in comparison to inpatient recruitment rates for 2019. Secondary outcomes were expressed interest in VIP services and SaFETy score overall and for each individual component. Descriptive statistics were performed using STATA SE v15.

Results

During the study period, a total of 76 patients were identified prior to their clinic visit as fitting the inclusion criteria. Thirty-four (44.7%) did not appear for their appointment. Ultimately, 42 patients were offered services and participation in the SaFETy survey. One patient could not complete the survey due to a language barrier, and 9 declined


Use this card ONLY if patient has been a victim of intent to harm (ex: gunshot, stab, etc)

Date_____ DOB _____

Patient Name _____

Circle one: Penetrating/Blunt

Inpatient VIP visit: Yes/No

If refused VIP services during inpatient visit, why? (Circle one or more)

Forgot / Not interested / Not needed /

Too busy / Lost information / Other

S: In the past 6 months, including today, how often did you get into a serious physical fight?

Never..... 0

Once..... 1

Twice..... 1

3-5 times..... 1

6 or more times..... 4

SEE REVERSE SIDE

****After completion, drop in locked bin at the front****

F: How many of your friends have carried a knife, gun or razor?

None..... 0

Some..... 0

Many, most or all..... 1

E: In the past 6 months, how often have you heard guns being shot?

Never..... 0

Once or twice..... 0

A few times 0

Many times..... 1

T: How often, in the past 6 months, has someone pulled a gun on you?

Never 0

Once 3

Twice or more 4

Total ..... _____

If patient obtains score greater than/equal to 1, please provide with VIP counseling information OR refer to resident/fellow

Fig. 1 Replica of front and back of SaFETy Survey card that was administered to study participants in the outpatient clinic

participation. Thirty-two patients completed the survey (76.2%). See Fig. 2.

The mean age of the participants was 31 ± 2 years, 83.3% were men, 81.0% were Black, and 90.5% had sustained a penetrating injury. The majority (59.5%) of penetrating injuries were due to gunshot wounds. Most patients were unemployed at the time of study implementation ($N = 25$, 61%), and a minority tested positive for drug or alcohol use at their index hospitalization. Detailed results are found in Table 1.

Overall participation rate in VIP services amongst patients who were recruited from the outpatient clinic at 6 months was 11.9%. In comparison, the inpatient recruitment rate in 2019 was 2.4%.

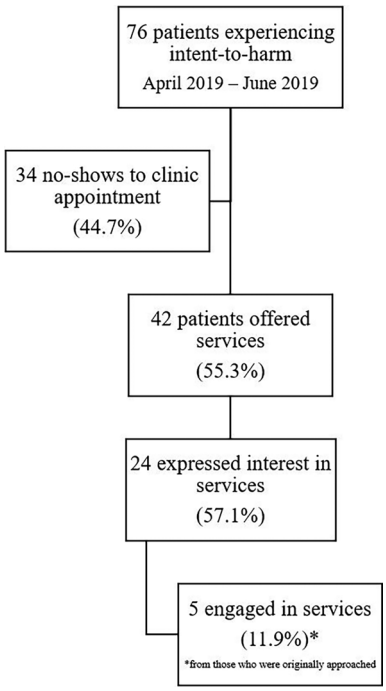


Fig. 2 Schematic of patients pre-identified for inclusion in the study and subsequent interview, survey completion, and service engagement rates

Table 1 Demographic and clinical characteristics of study population ($n = 42$)

Age, y	31 ± 2
Male gender ***n*** (%)	35 (83.3)
Race	
Black	34 (81.0)
White	3 (7.1)
Hispanic	4 (9.5)
Other	1 (2.4)
Mechanism	
Gunshot wound	25 (59.5)
Stab wound	13 (31.0)
Assault	4 (9.5)
Unemployed status	25 (61.0)
Toxicology screen*	
+ ETOH	10 (23.8)
Cocaine	4 (9.5)
Marijuana	14 (33.3)
Opioids	6 (14.3)

*Urine screen aside from ETOH (serum)

Out of 42 patients, 24 (57.1%) expressed interest in VIP services. The most common request was for job assistance, accounting for 37.5% of all requests, followed by social services (33.3%), counseling (16.7%), and educational support (12.5%). From the group that expressed interest, 5 (20.8%) took part in VIP services. One took part in a substance abuse program, another joined a male peer support group for violence victims held weekly at the VIP office, one accessed legal services, one initiated therapy with a VIP counselor, and another began the process of obtaining his GED. In addition to therapy and support groups offered by VIP staff, participants were referred to community organizations which provided them access to lawyers, substance abuse counselors, and education services. Not all participants had a documented reason for refusing services. Amongst the 11 respondents who gave a reason for refusing VIP services either during their clinic visit or during their hospitalization, most ($n=8$, 72.7%) stated that they were just not interested.

There were conflicting results between participants stating whether they were seen by VIP services during their admission and VIP records documenting a visit. VIP records demonstrated that 50% ($n=21$) of the study population had been seen by a VIP counselor while admitted to the hospital. When asked whether they had been seen by a VIP counselor during their hospitalization, 11 (26.8%) stated that they had never been offered VIP services during their hospitalization. Ten of the 11 patients who claimed they had not been seen during their hospitalization had documentation of a visit by VIP services.

Median scores were 0 points on each individual component of the SaFETy score except for the "fight" score, where half scored at least 1 point or higher. The median SaFETy score for the entire study population was 1 (IQR 1–3). Mean scores were similarly low for each component of the SaFETy score, ranging between 0.16 and 0.88 with a total mean score of 2.0 ± 1.9.

Discussion

This prospective, single-institution study evaluated the feasibility and effectiveness of an outpatient violence intervention program at a high-volume trauma center. Findings demonstrated moderate interest in violence prevention services amongst clinic participants but low long-term participation rates. Ultimately, 11.9% of patients approached participated in the program compared to long-term inpatient recruitment in 2019 of 2.4%. A secondary objective of the study was to assess the practical applicability of the SaFETy score, an instrument that has been used previously to identify individuals who are at high risk for firearm-related injury, in a clinic setting (Goldstick et al., 2017). The SaFETy survey tool performed poorly in this study population. Results of this study underscore the challenges of implementation of an HVIP at a level 1 trauma center including, but not limited to, difficulty establishing rapport with clients in a short visit, the inability of a screening tool to appropriately identify high-risk patients, the gap between reported interest and actual participation in services, and the inability to meaningfully reach and offer services to a large portion of patients during their inpatient admission.

There has been a proliferation of HVIPs across the nation. Although there are several studies demonstrating that these programs reduce violent trauma recidivism (Cooper et al., 2006; Purtle et al., 2013), little is known about programs' ability to recruit and retain participants in the long-term. Challenges in reaching a large proportion of this young, minority, and predominantly male urban population might be contributing to the lack of effectiveness attributed to these programs (Affinati et al., 2016; Zun et al., 2004). There is a need to generate methods that increase the participation of violence victims in violence prevention efforts. This study affirmed that although an outpatient program can create an avenue for violence prevention work, it suffers from the same issues of participation and retention that afflict inpatient programs. It is crucial that future assessments of violence intervention programs seek to understand and address the multitude of factors that affect program participation.

Our HVIP is unable to reach all violence victims at the time of hospitalization, an issue faced by HVIPs nationwide due to limited resource availability, high demand, and variations in program design (Juillard et al., 2016). In our study, 50% of participants were documented as being seen as inpatients, a number which is likely lower after accounting for individuals discharged directly from the trauma bay. The disconnect between a recorded HVIP visit by our program and a patient's recollection of a visit implies that meaningful inpatient encounters are much lower than documented. Future research must explore the reasons behind lack of uptake of VIP services with a view towards increasing the yield of the "teachable moment," known as the index hospitalization after injury. A clinic visit provides an opportunity to amplify the reach of an HVIP and may occur at a time when some individuals are more receptive and/or aware of their needs.

Another important finding in this study was the inability of the SaFETy score to capture the high level of risk experienced by the study population. Median scores were 0 for almost all of the components of the survey, indicating that it was a very poor tool for distinguishing high-risk individuals in this study. The SaFETy score was originally developed for use in the emergency department (ED) in Flint, Michigan, to identify youth at high risk for penetrating injury. Its short length makes it suitable for use in emergency settings as a screening tool and has been supported by organizations such as the American College of Surgeons to identify populations at high risk for trauma recidivism (Bulger et al., 2019). The

SaFETy score is the most clinically appropriate violence risk assessment tool that exists to date, as others are more cumbersome and designed for a criminal justice context (Glover et al., 2017; Singh et al., 2011). However, known risk factors for violent re-injury such as history of incarceration, prior hospitalization for violent injury, and weapon use (Richardson et al., 2016) are not addressed in the SaFETy score. Based on the low tabulated scores for almost all participants in this study, they would be stratified in the lowest risk categories for future firearm violence.

The establishment of trust through a "credible messenger" is crucial in forming honest relationships with young, violently injured Black men (Wical et al., 2020). The key to this relationship is that the credible messenger uses his own personal experiences with violence as a way of establishing a connection with the victim. This is difficult to relay in a short clinic visit. At the time of study implementation, a credible messenger was not employed by the HVIP. The lack of rapport established between the counselor and survey participants, most of whom were meeting each other for the first time, likely contributed to the inaccuracy of the survey results. Several participants chose not to complete the survey due to the sensitive nature of the questions. A credible messenger may be a more appropriate person to deliver a survey that covers issues such as exposure to violence and gun ownership, which might preferably be asked later in the relationship. Firearm injury victims have often had personal experiences that generated distrust in people of authority, including healthcare personnel. Using an individual's demographic characteristics (age, sex, race) and documented history of violent injury recidivism, substance use and/or criminal activity may be a better method to identify high-risk individuals rather than relying on the results of a survey (Buss & Abdu, 1995). Once these high-risk individuals are identified, building a trusting relationship is key to engagement in violence prevention services.

It is important to note that the SaFETy survey was administered to a different population than it was originally designed for. It was administered in a clinic setting, to an adult population and to participants who had a variable length of time after injury, which make the results difficult to interpret. The SaFETy score requires further study in this population to determine whether it has predictive potential.

It is imperative that future research explores barriers to engagement in HVIPs from multiple dimensions. Our research team has found the use of questionnaires and surveys to be limiting in this patient population. To that end, the authors are currently implementing a qualitative study using focus groups and in-depth interviews exploring psychotherapy models that are most relevant to violently injured young Black men. Despite the high rates of violent injury experienced by this population, they have largely been excluded from mental health research. Therapeutic approaches used for war veterans, victims of sexual assault, or the general population may not be effective for victims of urban violence. As demonstrated in this study, there is a gap between interest in services and actual engagement. Social restrictions imposed by COVID-19 have exacerbated this problem (Lalchandani et al., 2022). Additional areas for research include exploring community partnerships that may increase engagement while seeking practical solutions in the hospital environment that may build relationships and establish trust between violence victims and hospital staff. The use of a trauma-informed care approach, for instance, can foster positive interactions between patients and healthcare staff and facilitate patient participation in services (Fischer et al., 2019).

There are some limitations to this study that must be noted. The small sample size, quantitative approach, and short duration of the study limit the number of conclusions that can be drawn from the data. Although this is a prospective study, the participants were not randomly selected which can bias the results regarding the effectiveness of the survey instrument and services desired by the affected patient population. Future qualitative studies are needed to elucidate factors contributing to poor uptake of VIP services.

Conclusion

To the authors' knowledge, this is the first study evaluating the ability of an outpatient VIP to increase uptake of violence prevention services. It demonstrates that an outpatient VIP suffers from the same challenges faced by the inpatient program, with only slightly higher patient engagement but overall low rates of long-term participation. Ultimately, 11.9% of patients approached participated in the program compared to long-term inpatient recruitment in 2019 of 2.4%. There is a need to address the poor uptake of services by this patient population. Studies evaluating the reasons behind the lack of interest or lack of uptake of services after expressing interest are needed. The SaFETy score did not accurately capture the level of risk experienced by the study participants. Further evaluation of the score in adult patients who have experienced violent injury prior to large-scale implementation is necessary.

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Declarations

Ethics Approval Approval for the activities conducted as part of this study was granted by the Institutional Review Board (IRB) of the University of Maryland Medical Center under ID number HP-00088874.

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent to Participate This is a retrospective review of data collected for quality improvement purposes. After extensive review, exemption from informed consent was granted by the IRB.

Conflict of Interest The authors declare no competing interests.

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