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Self-reported Violence-related Outcomes for Adolescents Within Eight Weeks Of Emergency Department Treatment For Assault Injury

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Abstract

Purpose—To estimate, using a novel interactive voice response (IVR) survey, the incidence of self-reported violence-related experiences of adolescent assault-injured patients in the weeks following Emergency Department (ED) discharge.

Methods—In an urban ED, a prospective cohort study with eight week follow-up IVR survey either weekly, bi-weekly or monthly after discharge was conducted with patients aged 12-19 years presenting with assault-related injuries. Survival analysis methods were used to estimate cumulative risks of self-reported violence experience within four and eight weeks.

Results—Ninety-five patients were enrolled; 42 (44.2%) reported to the IVR survey. As a result of the ED index event, an estimated 18.2% (CI=9.1-34.6%) reported being assaulted (no weapon), 2.9% (CI=0.4-19.1%) had been shot or stabbed, 20.7% (CI=10.9-37.3%) had assaulted someone else (no weapon), and 2.9% (CI=0.4-19.1%) shot or stabbed someone else. Additionally, 54.6% (CI=39.6-70.9%) had avoided going certain places, 47.0% (CI=32.5-64.1%) considered retaliating, 38.1% (CI=24.3-56.3%) had been threatened, and 27.0% (CI=15.4-44.6%) had carried a weapon. Most outcome occurrences happened within four weeks. There was evidence that intent to retaliate when asked at baseline was associated with an elevated risk of several outcomes.

Conclusions—The risk for subsequent violence among assault-injured adolescent ED patients appears high within weeks of discharge.

Keywords

violence; trauma; injury; adolescent; recidivism

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Introduction

Assault-related trauma is a chronic, recurrent disease among America's adolescents. The potential for subsequent violence, heightened fear, and perceived need for weapon carrying may be particularly high among assaulted Emergency Department (ED) patients.[1] EDs remain an underutilized resource for identifying adolescents at greatest risk of subsequent injury and providing violence prevention resources.[2] To improve our understanding of risks adolescent patients face and factors that may identify those most needing intervention, we pilot tested an Interactive Voice Response (IVR) survey as a way to accomplish follow-up research with adolescent assault-injured patients.[3] This paper presents results of patients' self-reported violence experiences following ED discharge.

Methods

Recruitment and Baseline Data Collection

A prospective cohort study was conducted by interviewing 12-19 year-old patients treated after interpersonal assault (non-partner) in the ED of an urban, university-affiliated, tertiary care pediatric hospital during 2007-2008. Clinically-supervised research assistants conducted enrollment and explained to patients that our motivation was to ultimately help prevent violence and, more immediately, to learn more about violence-related experiences of adolescents in urban environments. Consenting patients were administered a 10-minute questionnaire using validated items.[4] Intent to retaliate was assessed by asking: “Not all fights are over after someone gets hurt. Do you think you will hurt someone because of this fight?”

Follow-up

Follow-up was accomplished with an IVR survey and randomly assigning patients to report either weekly, bi-weekly, or monthly, over eight weeks following discharge. This involved calling a toll-free telephone number, keying in a self-chosen access password, and keying Yes/No responses to recorded questions about violence-related experiences since discharge or since last reporting (published previously[5]).

Each patient received a gift card to a local convenience store chain. The card initially contained no value. During follow-up, the IVR system notified a study investigator each time a patient completed a report. Within 48 hours, the investigator electronically wired $5 to the card for each report that was made with a $10 bonus if all reports were completed.

Analysis

IVR data were analyzed using the product limit method and 95% confidence intervals (CI) to estimate the cumulative risk (ie, 1-survival) of each outcome within four and eight weeks of ED discharge.[6] Reported outcomes were assumed to have occurred on the date halfway between the report date and the date the patient was discharged from the ED or last reported. Stratified analyses evaluated whether a stated intent to retaliate when asked at baseline was associated with a differential risk of outcomes during follow-up. Stratified survival curves were evaluated for equality using the Peto-Peto-Prentice test[7,8] with differences presented as relative risks by dividing the intent group risk by the no-intent group risk. No power analysis was conducted given this was a feasibility study. The study was approved by the Institutional Review Board of The Children's Hospital of Philadelphia and a Certificate of Confidential was obtained from the National Institutes of Health.

Results

773 patients were screened for eligibility, 131 were eligible, and 95 (72.5%) participated (Table 1). 42 (44.2%) patients completed at least one IVR report during follow-up and 13.7% made all requested reports. Details of follow-up have been reported.[3]

Table 2 (top) reports the estimated four-week cumulative risk and eight-week cumulative risk of each of the 11 outcomes during follow-up. The four-week cumulative risk of being threatened, for example, was 30.9% (i.e., an estimated 30.9% had been threatened within four weeks) and an estimated 38.1% had been threatened within eight weeks of discharge. An estimated 18.1% of patients had threatened someone within four weeks and 21.5% of patients had threatened someone else, related to the initial event, within eight weeks. These risk estimates indicate that being threatened and threatening someone were quite common outcomes, and most instances regarding threats occurred within the first four weeks after receiving treatment for an assault-related injury. Several other outcomes were common and also occurred most often within 4 weeks.

Table 2 (bottom) shows that among patients who had expressed intent to retaliate during the initial ED interview, the estimated eight-week cumulative risks of threatening someone, carrying a gun or knife, beating up someone, and being beaten up were 53.3%, 48.6%, 31.4%, and 31.3% respectively. These patients were an estimated 4.9 times more likely to threaten someone during the eight weeks following discharge than were patients not having an intent to retaliate. Large relative risk estimates (ie, >2) suggested evidence that an intent to retaliate was also associated with being more likely to carry a gun or knife, beat up someone, or be beaten up during the weeks following discharge, however the null hypothesis of survival curve equality for these outcomes was not rejected.

Discussion

This study found evidence that violence-related experiences among adolescents treated for assault-related injuries are common during the weeks after being discharged from the ED. The results also suggest that simply asking adolescents if they have a plan to retaliate may help identifying those at particular risk to carry a weapon, threaten someone, assault someone, or be assaulted during coming weeks.

Despite limitations that include risks for reporting bias at baseline and from attrition and non-response during follow-up, one study site, a small sample, and using a retaliation intent question having unknown validity and reliability, the research approach used here is compelling and can have advantages over other methods that rely on hospital records to study recidivism, eg [9]. The research approach and remuneration protocol were used based on their success in an earlier study of adult patient victims of intimate partner violence.[10] Additional results regarding feasibility of the present study have been reported.[3] Based on those findings and the evidence here that adolescents' risks of violence-related experience following ED discharge are high, large-scale studies that use IVR to better understand and potentially test effects of interventions that might be administered to this patient population appear warranted. It will be important for those studies to assess the reliability and validity of the IVR method and of questions to assess ED patients' intent to retaliate.

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Table 1

Baseline Characteristics of Subjects

Characteristic	Subjects, % (n=95)
Sex	
Male	63.2
Female	36.8
Age, mean (SD)	15 (1.6)
Race	
African American	88.4
Caucasian	4.2
Other	7.2
School Performance	
Grades in past year	
Mostly A's and B's	24.2
Mostly B's and C's	41.1
Mostly C's and D's	17.9
Mostly D's and F's	8.4
Other	7.4
Ever suspended	77.9
Ever skipped or cut school	37.2
Prior fights	
≥1 other fight in past year	51.6
≥1 other fight requiring medical attention in past year	8.4
Friends' behaviors in past year	
Carried knife or gun	34.7
Got into physical fight	86.0
Heard gunshot in past year	85.3
Witnessed someone being beat up in past year	84.2
Substance use in past 30 days	
Tobacco	11.6
Alcohol	11.6
Marijuana	13.7
Weapon used during index assault	
Weapon used by patient only	0.0
Weapon used by assailant only	17.6
Weapon used by both patient and assailant	1.1
No weapon used	81.3
Indend to retaliate	32.6

SD: standard deviation.

Table 2

Self-reported Violence-related Outcomes During Eight Weeks Following Emergency Department Discharge

Cumulative Four-week and Eight-week Risks of Violence-related Outcomes

	Cumulative Risk	
Outcome	**Four-week risk (95% CI)**	**Eight-week risk (95% CI)**
Threats		
Been threatened	30.9% (18.8%-48.0%)	38.1% (24.3%-56.3%)
Threatened someone	18.1% (9.0%-34.5%)	21.5% (11.3%-38.8%)
Assaults		
Been beaten up	18.2% (9.1%-34.6%)	18.2% (9.1%-34.6%)
Beat up somone	20.7% (10.9%-37.3%)	20.7% (10.9%-37.3%)
Weapon-Related Assaults		
Been shot or stabbed	2.9% (0.4%-19.1%)	2.9% (0.4%-19.1%)
Shot or stabbed someone	2.9% (0.4%-19.1%)	2.9% (0.4%-19.1%)
Other		
Carried a gun or knife	27.0% (15.4%-44.6%)	27.0% (15.4%-44.6%)
Avoiding places due to index assault	56.2% (40.8%-72.8%)	56.2% (40.8%-72.8%)
Thought of hurting someone due to index assault	47.0% (32.5%-64.1%)	47.0% (32.5%-64.1%)
Sustained injury in a fight that required medical	12.9% (5.6%-28.4%)	12.9% (5.6%-28.4%)
Know someone who had been hurt in a fight	51.3% (36.7%-67.8%)	54.6% (39.6%-70.9%)

Cumulative Eight-week Risks and Relative Risks of Violence-related Outcomes Based on Stated Intent to Retaliate

	Intent to Retaliate		P-value	Relative risk
Outcome	**Yes**	**No**		
Threatened someone	53.3% (21.0%-91.6%)	11.0% (3.7%-30.6%)	0.016	4.9
Carried a gun or knife	48.6% (20.4%-85.5%)	21.8% (10.3%-42.4%)	0.074	2.2
Beat up someone	31.4% (11.3%-69.5%)	14.5% (5.7%-34.4%)	0.157	2.2
Been beaten up	31.3% (11.3%-69.5%)	14.4% (5.7%-34.2%)	0.182	2.2

P-values based on the Peto test of equivalence of survival curves.

Relative risks calculated by dividing the risk in the intent group by the risk in the no-intent group.