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## Understanding the Service Needs of Assault-injured, Drug-using Youth presenting for Care in an Urban Emergency Department

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Dr. Bohnert collaborated on the analysis plan and wrote the initial draft of this manuscript. Dr. Walton had full access to all the data in the study and takes responsibility for the acquisition of data, integrity of the data, and the accuracy of the data analysis. Dr. Walton conceptualized the study, is an investigator on the grant funding this work, and contributed to and has approved the final manuscript. Dr. Ranney edited the initial draft of the manuscript and contributed to and has approved the final manuscript. Dr. Bonar collaborated on the statistical analysis plan and contributed to and has approved the final manuscript. Drs. Zimmerman, Blow and Booth conceptualized the study and are investigators on the grant funding this work. They contributed to and have approved the final manuscript. Dr. Cunningham had full access to all the data in the study and takes responsibility for the acquisition of data, integrity of the data, and the accuracy of the data analysis. Dr. Cunningham conceptualized the study and is an investigator on the grant funding this work. Dr. Cunningham was responsible for the statistical analysis plan contributed to and has approved the final manuscript.

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## Abstract

**Background**—Violence is a leading cause of injury among youth 15–24 years and is frequently associated with drug use. To inform optimal violence interventions, it is critical to understand the baseline characteristics and intent to retaliate of drug-using, assault-injured (AI) youth in the Emergency Department (ED) setting, where care for violent injury commonly occurs.

**Methods**—At an urban ED, AI youth ages 14–24 endorsing any past six-month substance use (n=350), and a proportionally-sampled substance-using comparison group (CG) presenting for non-assault-related care (n=250), were recruited and completed a baseline assessment (82% participation). Medical chart review was also conducted. Conditional logistic regression was performed to examine correlates associated with AI.

**Results**—Over half (57%) of all youth met criteria for drug and/or alcohol use disorder, with only 9% receiving prior treatment. Among the AI group, 1 in 4 intended to retaliate, of which 49% had firearm access. From bivariate analyses, AI youth had poorer mental health, greater substance use, and were more likely to report prior ED visits for assault or psychiatric evaluation. Based on multivariable modeling, AI youth had greater odds of being on probation/parole (AOR=2.26; CI=1.28, 3.90) and having PTSD (AOR=1.88; CI=1.01, 3.50) than the CG.

**Conclusions**—AI youth may have unmet needs for substance use and mental health treatment, including PTSD. These characteristics along with the risk of retaliation, increased ED service utilization, low utilization of other health care venues, and firearm access highlight the need for interventions that initiate at the time of ED visit.

## Keywords

Youth; Assault; Injuries; Alcohol; Substance Use; Emergency Department

## 1. Introduction

Homicide is the second leading cause of death among all Americans ages 15–24 years, and the leading cause of death for African-Americans in the same age range.<sup>1</sup> It is also a leading cause of morbidity, with over 600,000 American youth ages 15–24 presenting to Emergency Departments (EDs) for assault-related injuries (i.e., intentionally caused by another person) every year.<sup>1</sup> Without intervention, an estimated 30% of assault-injured youth are re-injured within five years,<sup>2–4</sup> a considerable proportion of which are the result of retaliation from a prior assault.<sup>5</sup>

There is an extensive evidence-base regarding the association between substance use, mental health disorders, and a history of violence.<sup>6–18</sup> The few ED-based studies of youth with *acute assault-injuries* have reported high levels of depressive symptoms,<sup>19–23</sup> post-traumatic stress symptoms,<sup>22,24</sup> and alcohol/substance use.<sup>19,22,25</sup> Nonetheless, prior studies have been limited by: 1) the use of convenience samples; 2) the inclusion of only those with biological markers of substance use, alone; 3) interviewing patients long after the assault event took place; 4) the lack of use of diagnostic criteria for substance use/mental health disorders; 5) the lack of a non-injured comparison group of drug using youth.<sup>26–33</sup> Thus, the association between prior violence and other risky behaviors reported in previous studies

might simply reflect the higher prevalence of these risky behaviors among youth seen in urban, socio-economically disadvantaged EDs for *any* reason.<sup>34–36</sup>

Moreover, prior to the development of interventions for assault-injured youth, it is critical to understand the ideal location and optimal timing for such interventions. Case management-based interventions are increasingly being implemented with promising preliminary outcomes among those admitted to surgery units with severe injury.<sup>37,38</sup> Nonetheless, the majority of assault-injured youth are treated in the ED and released, underscoring the need for an examination of a broader sample of all assault-injured youth presenting for care.

In addition, risk factors for retaliatory violence following an index ED visit have been explored among children ages 10–14;<sup>5,39</sup> however, the subject has not been studied among drug-using assault-injured youth, or those ages 14–24 *who may be at greater risk of re-injury from retaliation*. Consequently, additional data are needed that examine drug-using youth presenting to the ED for care in order to determine whether service needs differ based on presenting complaint; namely, whether needs differ for those presenting for assault-related injury as compared with those presenting for other medical reasons. To disentangle this issue, the present study compares assault-injured youth in an urban ED who reported drug use, with a systematically sampled comparison group of youth who presented to the ED for other medical reasons and also reported drug use, in order to inform future potential interventions aimed at addressing unmet substance use and mental health service needs. Thus, we compare these two groups of drug-using youth (i.e., assault-related injury group and comparison group) in the present study. We hypothesize that: 1) assault-injured youth will have greater substance use, and mental health needs than other drug using youth; 2) acute timing of substance use is important, and that in the 24 hours prior to the ED visit use will be higher among assault-injured youth than other youth with drug use, suggesting that the ED may be the ideal place for intervention efforts during this high risk window in order to reduce the likelihood of future drug use and injury; and 3) among the assault-related injury group, there will be relatively high percentages of intent to retaliate, as well as firearm access, both of which are not generally assessed in the ED among assault-injured youth yet are critical issues that warrant focused evaluation at the time of ED care.

## 2. Methods

### 2.1. Study Design and Setting

This manuscript focuses on youth treated in an urban, level 1 trauma center ED located in Flint, MI, which is 57% African American.<sup>40</sup> Poverty and crime rates for Flint are comparable with other urban centers.<sup>41</sup> Study procedures were approved by the University of Michigan and the Medical Center's Institutional Review Boards, and a Certificate of Confidentiality was obtained.

### 2.2. Participant Recruitment

Two patient groups who reported any drug use within the past six months on a screening survey<sup>42</sup> were eligible for an ongoing natural history study: 1) Patients aged 14–24 years presenting to the ED for assault-related injuries, and 2) A comparison group of patients presenting for other reasons that was proportionally sampled based on sex and age-group

(i.e., 14–17 years, 18–20 years, and 21–24 years) characteristics of the assault-related injury group. The present manuscript reports findings from the initial baseline assessment.

Recruitment occurred seven days per week, excluding major winter holidays. The sample was recruited for screening by a research assistant (RA) 24 hours per day from Thursday through Monday, and from 5 AM until 2 AM on Tuesday through Wednesday. Patients presenting with a chief complaint of acute sexual assault or suicidal ideation or attempt were excluded from the screening survey as they were already receiving mental health services in the ED. Patients were also excluded if they had insufficient cognitive orientation due to conditions precluding informed consent, or if a minor had no parent/guardian available to give consent. Trauma patients who were too medically unstable to recruit in the ED were recruited on the hospital floor if they stabilized within 72 hours.

Assault-injuries were defined in keeping with the CDC definition,<sup>1</sup> i.e., those intentionally caused by another person, and were assessed by a RA at the time of ED presentation. Patients were identified through an electronic patient census, and were approached by RAs in waiting rooms or treatment spaces (12/2009–9/2011). As an example, after a 16-year old female with an acute assault-related injury screened positive for past six-month drug use and was enrolled into the study, RAs would recruit sequentially, by triage time, the next female from the 14–17 year old age-group who sought ED care for a medical or injury reason that was not due to assault and who screened positive for any past six-month drug use. Therefore, the comparison group was systematically enrolled in the study during the same timeframe and season as the assault-related injury group. Past six-month drug use and study eligibility were assessed using the NIDA-ASSIST,<sup>43–46</sup> which included the use of marijuana, cocaine, methamphetamine, inhalants, hallucinogens, street opioids, or misuse of prescription drugs (see measures).

Following written assent/consent by the patient (and parental consent < 18), patients completed a ~90 minute baseline survey, which included a self-administered and a structured interview section, and were compensated \$20 in cash. The survey was administered privately; family/friends of the patient could not see the computer.

### 2.3. Measures

Measures used in this study were reliable and valid for participants across the ages of 14–24.<sup>47–54</sup>

**Demographics**—Patient characteristics were collected using measures from the National Longitudinal Study of Adolescent Health (Add Health) and the NIH Drug Abuse Treatment Outcome Study of Adolescents (DATOS-A).<sup>52,55–57</sup>

**Substance Use**—Past six-month substance use and binge drinking,<sup>58</sup> were assessed using the Alcohol Use Disorders Identification Test (AUDIT) and the NIDA-ASSIST.<sup>43–46</sup> Other illicit drugs (excluding marijuana) were defined as including cocaine, methamphetamine, inhalants, hallucinogens, or street opioids. Misuse of prescription drugs (e.g., without a prescription, more than prescribed, for longer than prescribed) included assessment of misuse of stimulants, sedatives or sleeping pills, or opioids (with examples provided). Three

variables representing past six-month NIDA-ASSIST scores of: 1) marijuana, 2) one or more of the five remaining illicit drugs, and 3) one or more of the three prescription drugs were created. Drug and alcohol use for the 30 days prior to ED visit, including the prior day of the index ED visit, were assessed using a Timeline Follow back (TLFB) interview,<sup>59</sup> which obtains reliable and valid quantitative data.<sup>59–61</sup> Alcohol and drug use disorders in the past six-months were assessed via an RA-administered version of the Mini International Neuropsychiatric Interview (MINI 6.0, version 01/01/10) for patients >18 years and the MINI for Children and Adolescents (MINI-KID 6.0, version 01/01/10) for patients < 18 years.<sup>53,54</sup> For analyses, participants were categorized as meeting criteria for an alcohol use disorder or a drug use disorder (none/ any) (i.e., abuse *or* dependence).<sup>53,54</sup>

**Violence**—A modified version of the Conflict Tactics Scale-2 (CTS-2), measured prevalence of past six-month physical assault perpetration and victimization (using 13 different behaviors, e.g., pushing/shoving, slapping, using a knife/gun etc.) in dating/partner relationships and peer/non-partner relationships, separately.<sup>12,62</sup> Weapon carriage during the past six-months was measured via two items assessing whether participants “carried a knife or razor” and/or “carried a gun.”<sup>63</sup> Current gang affiliation was assessed via a question from the Tulane National Youth Study.<sup>48</sup> Community violence exposure was measured with five items,<sup>64</sup> with higher scores indicating more frequent community violence exposure.

**Mental Health**—Depressive and anxiety symptoms in the past week were assessed via twelve items from the Brief Symptom Inventory (BSI).<sup>65</sup> Suicide ideation and suicide attempt in the past 30 days were measured via two “yes” or “no” questions: “In the last 30 days, have you thought that you would be better off dead or that you wanted to hurt yourself in some way?” and “In the last 30 days, have you attempted to hurt yourself?” Mental health disorders were assessed via the RA-administered MINI and MINI KID (version 6.0, 01/01/10).<sup>53,54</sup> The presence or absence of a current major depressive episode was assessed; antisocial personality disorder (aged >18+)/conduct disorder (age <18), and posttraumatic stress disorder (PTSD) were assessed for the past month (excluding the incident from the day of ED visit). Items for each disorder reflected DSM-IV diagnostic criteria.

**Service Utilization**—Chart review data for past year prior ED visits at the study site were collected by trained RAs and categorized into “medical,” “psychiatric,” or “injury-related.” Injury visits were coded by a RA as “assault-related,” “unintentional injury,” or “self-harm” per standard E-Codes.<sup>66</sup> Discharge status (admit, discharge, died) was also collected. After abstraction, 5% of charts were audited; the error rate was <5%.<sup>67</sup> Attendance in substance use treatment, receiving mental health services, and having a routine physical exam was assessed by self-report using modified questions from the Add Health survey.<sup>55</sup> Primary care service utilization was assessed by modified questions from the Substance Abuse Outcomes Module.<sup>68</sup>

**Criminal Justice**—Current legal status (i.e., on probation/parole) was assessed using a “yes” or “no” item, from the Addiction Severity Index.<sup>69</sup>

**Retaliation**—The assault-injured group reported whether or not they thought that the conflict that brought them to the ED was over (i.e., “Do you think that the conflict that

caused this incident is over?”), and about plans to retaliate (i.e., “Do you plan to hurt anyone because of what happened today?”; “Do you think that any of your friends or family members will hurt anyone because of what happened?”).<sup>6</sup>

## 2.4. Statistical Analysis

All analyses were conducted using SAS 9.2. Chi-square analyses and t-tests were used to evaluate bivariate associations with the outcome of interest (i.e., assault-related injury). In multivariable modeling procedures, conditional logistic regression was used to identify variables associated with reason for ED presentation (assault injury vs. comparison). Conditional logistic regression was used to take into account the sampling scheme, which balanced on age group and sex during recruitment. Background characteristics were included in the model based on prior literature [i.e., race (African American vs. Other), receipt of public assistance], and based on significance in bivariate analyses (i.e., being married/cohabitating with a partner, being on probation/parole). Substance use and mental health disorder variables were also included: Alcohol Use Disorder (yes/no), Drug Use Disorder (yes/no), PTSD (yes/no), Major Depressive Episode (yes/no), and Antisocial Personality/Conduct Disorder (yes/no). In addition, because we could not include all variables in the multivariable model (e.g., due to multicollinearity and small cell sizes), we chose to focus on and include the most clinically serious/relevant problems (e.g., meeting criteria for Major Depressive Episode rather than including depressive symptoms).

## 3. Results

### 3.1. Description of the Sample

Six hundred youth with past six-month substance use were included in the study sample; 350 presented with acute assault-related injury (“assault-injured group”) and 250 presented for unintentional injury or other medical reasons (“comparison group”) (see Figure 1 for recruitment flowchart).

### 3.2. Bivariate Comparison of Assault Group vs. Comparison Group

**Demographic Information**—With the exception of marital status, demographic characteristics of youth in the assault group and the comparison group were similar (Table 1). Overall, participants had a mean age of 20.1 years ( $SD = 2.4$ ), were mostly male (58.8%), and mostly African American (58.2%). Consistent with the local population 5.8% were Hispanic. Most youth received public assistance (73.0%).

**Substance Use**—The assault-injured group reported more drinking days in the past month than the comparison group; however, no differences in binge drinking or mean audit score over the past six-months were noted (Table 1). All youth reported past six-month drug use based on study eligibility criteria. In the past six-months the assault group reported more other illicit drug use than the comparison group. In the 30 days prior to ED presentation, the assault-injured youth reported more days of alcohol use on the TLFB interview than the comparison youth. Within a day prior to the index visit, assault-injured youth were more likely to report alcohol, marijuana, or other illicit drug use than the comparison group. More

than half (57.2%) met criteria for a drug use disorder and 19.7% met criteria for an alcohol use disorder.

**Criminal Justice**—A significantly greater percentage of assault-injured participants were engaged in the criminal justice system, as indicated by being on probation/parole (16% in the assault-injured vs. 8%; Table 2).

**Violence**—The assault-injured group had significantly higher percentages of prior violence perpetration and victimization (with both partners and non-partners; Table 1) than the comparison group. There were no group differences in percentages of weapon carriage, gang membership (which was rare, 5.3%), or level of community violence exposure.

**Mental Health**—Almost half (42.0%) of the sample met criteria for any mental health problem. Assault and comparison groups did not significantly differ regarding suicide ideation or attempt, major depressive episode, antisocial personality/conduct disorder. Notably, among those reporting recent suicidal ideation or attempt, 44.3% had access to a firearm. Youth in the assault group reported higher depressive and anxiety symptoms, and were more likely to meet criteria for PTSD.

**Service Utilization**—Approximately half of the participants in each group visited the study ED in the prior year per medical chart review (Table 2). Assault-injured youth were more likely to have presented for previous assault-related injury and were more likely than those in the comparison group to present for psychiatric evaluation (including self-harm). Participants self-reported that most of their past six-month ED visits were to the study ED, with less than 20% of participants using other EDs. A majority of the individuals in both groups were discharged from the ED at index visit. Despite high rates of self-reported substance use disorders, only 8.7% of the sample reported past six-month substance use treatment. Furthermore, less than 20% of participants reporting “feeling sad or depressed” had received mental health services in the six months prior to baseline assessment. In addition, participants from both groups reported low utilization of primary care services: 59.3% reported having a primary care physician, and 42.8% had a recent routine physical exam.

**Retaliation (among assault injury group)**—With regard to the conflict that precipitated the injury, almost half (42.9%) of assault-injured patients reported the conflict was “not over”, and 24.0% indicated that they or their family/friends would plan to retaliate because of the conflict. Of participants who thought that they, themselves, would retaliate, 62% had current access to a firearm.

### 3.3. Multivariable Model Examining Reason for ED presentation

Multivariable conditional logistic regression was conducted to examine associations between key variables of interest, and reason for ED care (assault injury vs. other reason; Table 3). Meeting criteria for PTSD and currently being on probation/parole were associated with higher odds of assault-related ED presentation; conversely, being married/living with a partner was associated with significantly decreased odds of being in the assault group.

## 4. Discussion

Despite prior literature describing strong associations between substance use and youth violence,<sup>6-8,70</sup> this study is the first, to our knowledge, to characterize the temporal relation of prior-day substance use and the type and severity of substance and mental health disorders, among a systematic sample of youth seeking care for acute assault injury. Such research is essential to developing interventions that are relevant for youth residing in urban areas, who often have exacerbated exposure to violence, as well as health disparities related to access to services. It is noteworthy that few youth had accessed services outside of the ED even though over half of the total sample met diagnostic criteria for a drug use disorder, and 20% met criteria for an alcohol use disorder. In addition, the majority of youth in both groups were discharged from the ED after their index visit, and most did not have a recent routine physical exam where prevention could be addressed. These findings emphasize the extensive unmet substance use and mental health needs, as well as the urgency for intervention, among assault-injured youth presenting to the ED. This urgency is further highlighted by the rates of youth who have intent to retaliate. Moreover, an urban ED visit may be the sole contact opportunity for intervention among these youth in the community settings to prevent future substance use and injury.

In this group of drug-using youth few differences were noted in past six-month drug use, with other illicit drug use the only difference noted between groups. Nonetheless, in the period of time more proximal to the index ED visit we observed an escalation in substance use, with the assault-injured youth reporting more days of recent alcohol use. This relationship of alcohol and drug use in the days leading up to the assault injury, a pattern of drug use that differs from their drug-using peers, is consistent with prior research documenting the association between alcohol, cocaine use, and violence, which may be due to increased aggressiveness,<sup>7,11,71</sup> or involvement with illegal drug markets.<sup>72</sup> This increased substance use in the day prior to the assault-related injury, may suggest a particularly vulnerable time for youth that merits intervention.

The high prevalence estimates of mental health symptoms and disorders were observed in both groups of substance-using youth. Specifically, almost 15% of the total sample reported past-30-day suicidal ideation, of which 41% had access to a firearm, and 3.5% reported past-30-day suicidal behavior. These rates are higher than *lifetime* suicidal behavior in a recent similarly-aged community sample.<sup>73</sup> Suicidality rates did not differ between assault-injured and comparison groups at baseline; nonetheless, longitudinal studies are needed to examine whether and to what extent an assault-related injury requiring ED care impacts mental health trajectories.

Although both groups had exacerbated mental health needs, assault-injured youth were more likely to meet criteria for PTSD on the index visit. Moreover, PTSD symptoms were specifically assessed in relation to a prior event, and could not be attributed to the present assault (i.e., participants were told not to reference the reason for the current ED presentation). Prior studies with convenience samples of assault-injured youth have found that 30–90% of patients have at least one acute stress reaction-related symptom at the time of the visit, and 2–6% have symptoms consistent with post-trauma stress syndromes at one-

month follow-up.<sup>22,74,75</sup> These studies, however, did not assess pre-existing PTSD symptoms. In addition, individuals with prior PTSD might be more likely to experience subsequent PTSD after exposure to a second qualifying traumatic event, such as the assault that resulted in the ED index visit.<sup>76</sup> Some literature also suggests that prior violence-related stress reactions increase the risk of future violence<sup>17</sup> and decrease long-term quality of life.<sup>77</sup> Although effective PTSD treatment exists,<sup>78,79</sup> given the low overall rates of healthcare service utilization in our sample, it is unlikely that these youth will receive appropriate services.

Although higher rates of violence were observed among the assault-injured group than the comparison group, the majority of both groups reported high levels of involvement with violence. This finding is concerning in light of current data showing that prior violence is a risk factor for future violence and that retaliatory violence is a key reason for fighting.<sup>42,47,80,81</sup> Indeed, among the assault group, almost half said that the assault-related conflict was not over, and many of these youth noted access to firearms. Although other researchers have developed screening tools for future violence,<sup>32,82</sup> retaliation and firearm access are not usually assessed as part of routine clinical ED care.<sup>82,83</sup> The current data emphasize the need for healthcare workers to assess both retaliation and access to lethal means among assault-injured youth.

With respect to intervention content and delivery locations, these data underscore the need for initiating interventions for assault-injured youth during the ED visit, especially given the risk for retaliation, in order to prevent possible future assault-related injury. A handful of studies have used case management approaches among youth admitted for assault-related injuries with some positive short term findings.<sup>37,38</sup> In our study, given 77% of youth were discharged from the ED, such inpatient approaches would have missed 3 out of 4 assault-injured youth.

#### 4.1. Limitations

First, the observational and cross-sectional design limits causal interpretation. Second, the sample comes from a single urban ED; therefore, findings may not generalize to other settings. Third, survey data were collected via self-report, which has potential limitations, including problems related to respondent recall; however, prior research supports the reliability and validity of self-report computerized assessments among samples of youth.<sup>84,85</sup> Finally, past-year ED service utilization was collected via chart reviews within one health system and may be underestimated. Nonetheless, 82% of participants in this study reported using the study ED for their care.

#### 5.0. Conclusions

Assault-injured youth seeking ED care have high levels of intent to retaliate, unmet mental health service needs, suicidality, violence, substance use disorders, and little access to care outside the ED setting. Of particular concern, drug-using youth with acute assault-related injury have a higher prevalence of baseline PTSD than drug-using youth presenting for other medical reasons, as well as greater substance use prior to ED presentation. The access to firearms among the sample is also noteworthy. These results support the potential of efforts

that address substance use disorders, as well as, co-occurring mental health disorders among assault-injured youth, and highlight that the ED may be an appropriate setting to initiate such interventions at the time of care.

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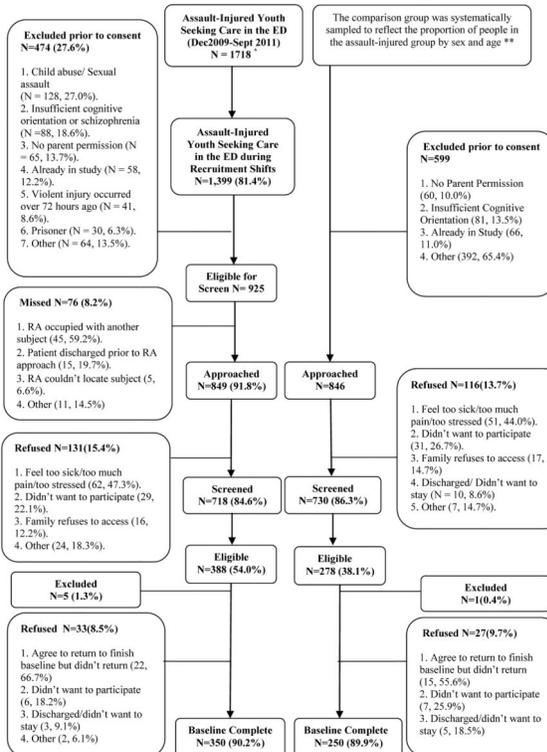
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### Highlights

- Over half of all youth in this ED sample met criteria for a substance use disorder.
- Among assault-injured youth, 1 in 4 intended to retaliate.
- Being on probation/parole and having PTSD were associated with assaultive injury.
- Findings emphasize substance use and psychiatric needs of assault-injured youth.



**Figure 1. Project Flowchart (Dec. 2009- Sept. 2011)**

Note: RA = Research Assistant, ED = Emergency Department, \*[Assault-injured patients seeking care NOT during Recruitment Shifts N=319 (18.6%)] i.e. only 18.6 % of assault-injured youth sought ED care during time a RA was not present, \*\*see methods section for details

**Table 1**

Demographic, substance use, violence, and mental health characteristics and differences between the Assault injured youth and the comparison group.

	Total Sample N=600 (100%)	Assault-Injured Group N=350 (58.3%)	Comparison Group N=250 (41.7%)	OR (95% CI)
<b>Demographic Characteristics</b>				
Age	20.1(2.4)	20.0 (2.4)	20.2 (2.4)	0.97(0.90–1.03)
Female	247 (41.2%)	143 (40.9%)	104 (41.6%)	0.97(0.70–1.35)
African American	349 (58.2%)	206 (58.9%)	143 (57.2%)	1.07(0.77–1.49)
<b>Married/Living with Partner*</b>	<b>170 (28.3%)</b>	<b>86 (24.6%)</b>	<b>84 (33.6%)</b>	<b>0.64(0.45–0.92)</b>
Has a Child	242 (40.3%)	144 (41.1%)	98 (39.2%)	1.08(0.78–1.51)
Currently in School	240(40.0%)	133(38.0%)	107(42.8%)	0.82(0.59–1.14)
Parent/Self on Public Assistance	438 (73.0%)	257 (73.4%)	181 (72.4%)	1.05(0.73–1.52)
<b>Past 6 Month Substance Use</b>				
Marijuana ASSIST Score (Mean, S.D)	13.3(9.0)	13.4(9.1)	13.2(8.88)	1.00(0.98–1.02)
<b>Other Illicit Drug Use (excluding MJ) ASSIST Score (Mean, S. D.)*</b>	<b>1.97(8.96)</b>	<b>2.55(10.6)</b>	<b>1.16(5.80)</b>	<b>1.02(1.00–1.05)</b>
Any Non-medical Prescription Drug Use ASSIST Score (Mean, S. D)	3.11(10.20)	3.02(10.15)	3.22(10.29)	1.00(0.98–1.01)
Alcohol Use AUDIT score (Mean, S.D)	1.32(1.24)	5.26(7.28)	4.27(5.73)	1.02(1.00–1.05)
Binge Drinking	246 (41.0%)	142 (40.6%)	104 (41.6%)	0.96(0.69–1.33)
Drug Use Disorder (abuse/dependence)	343 (57.2%)	207 (59.1%)	136 (54.4%)	1.21(0.87–1.68)
Alcohol Use Disorder (abuse/dependence)	118 (19.7%)	78 (22.3%)	40 (16.0%)	1.51(0.99–2.29)
<b>Past 30 Day Substance Use<sup>a</sup></b>				
Marijuana Use (Mean, S.D.)	15.5(12.2)	16.0 (12.2)	14.9(12.2)	1.01(0.99–1.02)
Non-Medical prescription Drug Use(Mean, S.D)	0.8(3.5)	0.82(3.72)	0.80(3.14)	1.01(0.96–1.05)
<b>Alcohol Use* (Mean, S.D.)</b>	<b>3.3(5.6)</b>	<b>3.7(6.2)</b>	<b>2.7(4.6)</b>	<b>1.04(1.00–1.07)</b>
<b>Substance Use within prior day of Index ED Visit<sup>a</sup></b>				
<b>Any Drug use**</b>	<b>367 (61.3%)</b>	<b>229 (65.6%)</b>	<b>138 (55.2%)</b>	<b>1.55 (1.11–2.16)</b>
<b>Marijuana use*</b>	<b>358 (59.8%)</b>	<b>222 (63.6%)</b>	<b>136 (54.4%)</b>	<b>1.46 (1.05–2.04)</b>
<b>Alcohol use***</b>	<b>145 (24.2%)</b>	<b>109 (31.2%)</b>	<b>36 (14.4%)</b>	<b>2.70 (1.77–4.11)</b>
<b>Illicit drug use (excluding MJ)**</b>	<b>12 (2.0%)</b>	<b>12 (3.4%)</b>	<b>0</b>	<b>N/A</b>
Non-Medical Prescription drug use	31 (5.2%)	19 (5.4%)	12 (4.80%)	1.14 (0.54–2.40)
<b>Past 6 Month Violent Behaviors/ Experiences</b>				
<b>Any Dating Violence***</b>	<b>384(64.0%)</b>	<b>248(70.9%)</b>	<b>136(54.4%)</b>	<b>2.04(1.45–2.86)</b>
<b>Dating Violence Perpetration**</b>	<b>297 (49.5%)</b>	<b>191 (54.6%)</b>	<b>106 (42.4%)</b>	<b>1.63(1.18–2.26)</b>
<b>Dating Violence Victimization***</b>	<b>361 (60.2%)</b>	<b>235 (67.1%)</b>	<b>126 (50.4%)</b>	<b>2.01(1.44–2.81)</b>
<b>Any Non-Partner Violence***</b>	<b>449(74.8%)</b>	<b>305(87.1%)</b>	<b>144(57.6%)</b>	<b>4.99(3.34–7.45)</b>
<b>Non-Partner Violence Perpetration***</b>	<b>360 (60.0%)</b>	<b>238 (68.0%)</b>	<b>122 (48.8%)</b>	<b>2.23(1.60–3.12)</b>

	<b>Total Sample N=600 (100%)</b>	<b>Assault-Injured Group N=350 (58.3%)</b>	<b>Comparison Group N=250 (41.7%)</b>	<b>OR (95% CI)</b>
<b>Non-Partner Violence Victimization ***</b>	<b>394 (65.7%)</b>	<b>276 (78.9%)</b>	<b>118 (47.2%)</b>	<b>4.17(2.92–5.96)</b>
Carry Knife	185 (30.8%)	109 (31.1%)	76 (30.4%)	1.04(0.73–1.47)
Carry Gun	82 (13.7%)	45 (12.9%)	37 (14.8%)	0.85(0.53–1.36)
Gang Member	32 (5.3%)	16 (4.6%)	16 (6.4%)	0.70(0.34–1.43)
Community violence	6.7 (3.6)	6.9(3.4)	6.4(3.9)	1.04(0.99–1.09)
<b>Mental Health</b>				
<b>Depressive Symptoms (past week) *</b>	<b>4.7 (5.3)</b>	<b>5.1 (5.6)</b>	<b>4.0 (4.8)</b>	<b>1.04(1.01–1.08)</b>
<b>Anxiety (past week) **</b>	<b>4.2(5.3)</b>	<b>4.8(5.7)</b>	<b>3.4(4.6)</b>	<b>1.05(1.02–1.09)</b>
<b>PTSD (past month) *</b>	<b>61 (10.2%)</b>	<b>44 (12.6%)</b>	<b>17 (6.8%)</b>	<b>1.97(1.10–3.54)</b>
Suicide Ideation (past 30 days)	83 (13.8%)	49 (14.0%)	34 (13.6%)	1.03(0.65–1.66)
Suicide Attempt (past 30 days)	21 (3.5%)	12 (3.4%)	9 (3.6%)	0.95(0.39–2.29)
Major Depressive Episode (past 2 weeks)	81(13.5%)	53(15.1%)	28 (11.2%)	1.41(0.87–2.31)
Antisocial Personality/Conduct Disorder	134 (22.3%)	83 (23.1%)	52 (21.2%)	1.12(0.76–1.66)
Any Mental Health Problem <sup>b</sup>	252(42.0%)	158(45.1%)	94(37.6%)	1.37(0.98–1.90)

Note:

\* p<0.05,

\*\* p<0.01,

\*\*\* p<0.001;

<sup>a</sup>The assault-injured group for TLFB data is out of 349 participants rather than 350.

<sup>b</sup>Positive for PTSD, Major Depressive Episode, Antisocial Personality/ Conduct Disorder, and/ or positive for suicide attempt/ideation, and/or positive for mental health problem (defined as 2 standard deviations above the mean for depressive symptom and/or anxiety measure); OR= Odds Ratio, CI = Confidence Interval.

**Table 2**

Differences in Health service utilization, between Assault Injured youth and Comparison youth presentation group (n=600)

	Total Sample N=600 (100%)	Assault-Injured Group N=350 (58.3%)	Comparison Group N=250 (41.7%)	OR (95% CI)
<b>Past Year Chart Review of ED Service Utilization</b>				
For Any Reason	303 (50.5%)	169 (48.3%)	134 (53.6%)	0.81(0.58–1.12)
<b>For Assaults*</b>	<b>57 (9.5%)</b>	<b>40 (11.4%)</b>	<b>17 (6.8%)</b>	<b>1.77(1.00–3.20)</b>
<b>For Psychiatric Evaluation incl. Acute Self-harm*</b>	<b>35 (5.8%)</b>	<b>26 (7.4%)</b>	<b>9 (3.6%)</b>	<b>2.15(1.00–4.67)</b>
<b>Discharged on ED Visit Day**</b>	<b>506 (84.3%)</b>	<b>271 (77.4%)</b>	<b>235 (94.0%)</b>	<b>0.22 (0.12–0.39)</b>
<b>Past Six-Month Health Care Service Utilization and Health Insurance Status</b>				
Have a Primary Care Physician/Clinic	356 (59.3%)	216 (61.7%)	140 (56.0%)	1.27(0.91–1.76)
Had a Routine Physical Exam	257 (42.8%)	157 (44.9%)	100 (40.0%)	1.22(0.88–1.70)
<b>Past Six-Month Substance Use or Mental Health Treatment</b>				
Substance Use Treatment	52 (8.7%)	31 (8.7%)	21 (8.4%)	1.06(0.59–1.89)
Mental Health Treatment <sup>a</sup>	63(17.9%)	37 (17.4%)	26 (18.8%)	0.91(0.52–1.58)
<b>Criminal Justice Involvement</b>				
<b>Currently on Probation/Parole**</b>	<b>75 (12.5%)</b>	<b>56 (16.1%)</b>	<b>19 (7.6%)</b>	<b>2.32(1.34–4.02)</b>

Note:

\* p<0.05,

\*\* p<0.01,

\*\*\* p<0.001

<sup>a</sup> among the subsample (Assault group n=213, Comparison group n=138) reporting feeling sad, blue, or lost interest in things; OR= Odds Ratio, CI= Confidence Interval.

**Table 3**

Multivariable conditional logistic regression estimating associations between ED presentation for assault-injury and socio-demographic characteristics, substance use disorders, and mental health disorders (n=600)

<b>Variable</b>	<b>AOR</b>	<b>95% CI</b>
African American/Black	1.04	0.74–1.48
<b>Married/Living with a partner*</b>	<b>0.66</b>	<b>0.45–0.96</b>
Public Assistance	1.07	0.74–1.57
Drug Use Disorder	1.08	0.75–1.55
Alcohol Disorder	1.44	0.90–2.32
Major Depressive Episode	1.25	0.73–2.14
Antisocial Personality/Conduct Disorder	0.83	0.52–1.33
<b>PTSD*</b>	<b>1.88</b>	<b>1.01–3.50</b>
<b>On Probation/Parole**</b>	<b>2.26</b>	<b>1.28–3.90</b>

Note: Modeling also takes into account the sampling variables of age group and sex; AOR= Adjusted Odds Ratio, CI = Confidence Interval.

\*  
p<0.05

\*\*  
p<0.01

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p<0.001