

## Screening for Youth Firearm Violence Exposure in Primary Care



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**Introduction:** The aim of this study was to assess a modified gun violence exposure tool at a pediatric clinic on the West Side of Chicago to identify youth at high risk of future gun violence.

**Methods:** A modified version of the SaFETy gun violence exposure tool, studied in a community pediatric primary care setting, was implemented from June to August 2021. Patients and pediatric clinicians were surveyed after pilot.

**Results:** Of 508 eligible patients, 341 youth (67.1%) completed the SaFETy tool. None had a SaFETy score  $\geq 6$ , the threshold for immediate referral. Over a quarter (26.4%) of youth had scores of 1–5, and of those, 7.8% were referred at the clinician's discretion. Youth ( $n=84$ ) participants randomly selected to complete an anonymous survey provided feedback about the SaFETy tool, reporting that the questions were easy to understand (92%). All 6 pediatric clinicians surveyed agreed that the tool helped to identify youth exposed to gun violence.

**Conclusions:** Screening for gun violence exposure among youth is logistically feasible in the pediatric outpatient setting. A more sensitive validated tool to stratify low-/medium-risk patients in the primary care setting is needed.

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## INTRODUCTION

Community gun violence is a public health epidemic that negatively impacts the mental health and overall well-being of youth and families.<sup>1–3</sup> In 2018 alone, there were >18,830 gun-related homicides across all age groups in the U.S., with the highest rates among non-Hispanic Black and American Indians.<sup>4</sup> In 2017, more than a quarter (28.2%) of Chicago high school students were exposed to gun violence (i.e., directly and indirectly reported witnessing or experiencing gun violence) in their lifetime, and in 2013, it was estimated that 547,000 youth between the ages of 10 and 24 years presented for treatment to hospitals for violent injuries in the U.S.<sup>5,6</sup> There is a critical need to disrupt the cycle of gun

violence by developing strategies that help identify and provide interventions for youth exposed to gun violence. Previous work has focused on screening and managing high-risk youth with known exposure to community violence (assault-related injuries)<sup>7</sup> for risk of future firearm violence in emergency department (ED)<sup>8</sup> and hospital settings.<sup>9</sup> The creation of the SaFETy score tool, a 4-

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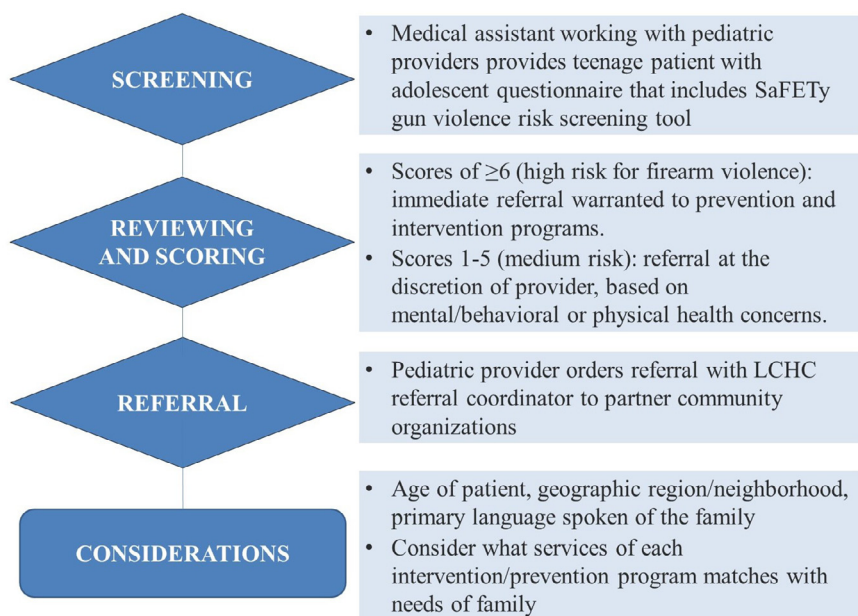
question ED tool ascertaining violence victimization, community exposure, peer influences, and fighting, showed that youth with higher SaFETy scores had higher odds of future firearm violence within 2 years (OR=1.47, 95% CI=1.23, 1.79) for a 1-point increase in SaFETy score. Other research has focused on evaluating interventions among youth already identified as at high risk of experiencing and perpetrating violence in the ED, such as the SaFERteens intervention, which demonstrated that therapy-based interventions significantly reduced violent behaviors at 3 months and 12 months.<sup>8</sup> As important as it is to evaluate and intervene among youth exposed to gun violence when presenting to the ED with injuries, the pediatric primary care setting may provide more optimal care coordination for interventions among youth exposed to gun violence. Youth, families, and primary care clinicians can share their perspectives and determine long-term solutions to problems in a manner that can be difficult in a single specific problem-based ED visit.<sup>9,10</sup> Primary care is an ideal setting where social determinants of health and access to community resources can be identified with longitudinal follow-up to ensure that youth and families have equitable access to mental health and trauma resources. Therefore, this study sought to explore the feasibility of integrating a modified SaFETy score gun violence risk assessment tool previously studied in an ED<sup>7</sup> into a pediatric preventive intake form at a federally qualified healthcare center on the West Side of Chicago by eliciting the anonymous perspectives of adolescent patients and clinicians on its implementation and by evaluating whether it identifies youth at risk of future firearm violence.

## METHODS

Lawndale Christian Health Center is a federally qualified healthcare center treating adolescents aged between 12 and 17 years on the West Side of Chicago in the Lawndale community known for high rates of gun violence. Investigators at Ann and Robert H. Lurie Children's Hospital of Chicago and Lawndale Christian Health Center partnered with community organizations to modify the original SaFETy tool, a rapid clinical screening tool to identify youth at high risk for future firearm violence, which was first developed by Goldstick et al. and validated in an urban ED setting.<sup>7</sup> The 4 questions included in the original SaFETy tool were as follows: *In the past 6 mo, including today, how often did you get into a serious physical fight?*; *How many of your friends have carried a knife, razor, or gun?*; *In the past 6 mo, how often have you heard guns being shot?*; and *How often, in the past 6 mo, including today, has someone pulled a gun on you?* The committee made minor changes to the

questions to identify broader violence patterns by asking about any fight instead of serious fights, increasing the score contribution of patients who reported 3–5 physical fights from 1 point to 2 points, and asking whether the patient's friends have carried any other weapon (besides knife, razor, or gun). The committee made no modification to the risk strata (0, low-risk; 1–5, medium risk;  $\geq 6$ , high-risk of firearm violence) and developed a referral protocol to violence intervention and prevention programs (Figure 1). These intervention and prevention programs held by community organization partners in the Chicago area provide youth development coaching, mentoring, support groups, and crisis management services to prevent youth violence.

All involved healthcare personnel (pediatric clinicians, nurses, medical assistants, and clinic managers) were trained at the same time on the workflow outlined in Figure 1 and the modified SaFETy tool by the senior authors of this study. The senior authors described the motivations to conduct the study, elicited feedback on the proposed project, and discussed the logistical process through which patients would be screened during their visit. The screening protocol first began with 1 clinician on May 25, 2021, before expanding to all 6 clinicians at Lawndale Christian Health Center before the end date for data collection of August 10, 2021, to include all patients aged between 12 and 17 years. The modified SaFETy tool was completed by all patients, regardless of the primary language spoken during their well-child visit as part of standard of care and included in the existing adolescent preventive questionnaire every patient (aged 12–17 years) is asked to complete. Deidentified electronic health record data, including demographic characteristics of patients by caregiver or patient report (age, sex, race and ethnicity, and insurance status) as well as physical, behavioral, and mental health diagnoses; SaFETy scores; and referrals to community programs, were collected over the pilot period. To seek the perspectives of participants about the screening tool, it was collaboratively decided after discussion with clinicians regarding their time restraints that they would be willing and able to have 25% of their patients during well-child checks complete an additional anonymous Likert scale survey about the initial screening tool. This survey asked participants to respond from a spectrum of 5 options to capture responses expressing very negative to very positive reactions. They were asked whether the questions were easy or hard to understand, whether they answered honestly or dishonestly, and whether they felt comfortable or uncomfortable answering the questions. These surveys were deposited by patients in a closed lockbox before checkout of their visit and therefore were not identifiable. Similarly, the opinions of the clinicians on



**Figure 1.** Screening and referral protocol and considerations. LCHC, Lawndale Christian Health Center.

the screening questions were sought by providing a Likert scale survey to the 6 involved clinicians at the end of the data collection period. They were queried to determine whether they believed that the screening tool helped to identify participants at high risk for future firearm violence and provided an open textbox for comments or feedback on improving the implementation of the project. This study was approved by Ann and Robert H. Lurie Children's Hospital of Chicago's IRB.

## RESULTS

In the study period, 341 youth (67.1%) of 508 patients seen during the pilot project completed the SaFETy tool (Table 1). The questions took <1 minute for adolescent patients to complete and very briefly extended the review of the preventative care checklist that all incoming youth must complete. Most youth were Hispanic (58.9%) or non-Hispanic Black (37.8%). About 40.2% of patients had  $\geq 1$  mental/behavioral health diagnoses, and 56% had  $\geq 1$  existing physical health diagnoses. No patients had a SaFETy score  $\geq 6$ , the threshold for immediate referral. Over one quarter of patients (26.4%) had a score of 1–5, and of those, 7 patients were recommended to be referred to a community violence prevention and intervention program at the clinician's discretion.

Approximately 25% of youth randomly provided anonymous feedback on the tool, where 91.7% found the questions very easy to understand, and 98.8% reported having answered honestly. All 6 clinicians

agreed or strongly agreed that the questionnaire helped to identify high-risk patients who otherwise would not have been identified.

## DISCUSSION

During our pilot study, 341 (67.1%) youth completed the SaFETy questionnaire. Over one quarter of patients were considered medium risk for experiencing community violence. No youth scored in the highest risk exposure category, and most youth (73.6%) scored in the lowest risk category. With collaboration from clinicians and local organizations, it is logistically feasible to screen youth in the pediatric primary care setting who are exposed to gun violence and could benefit from prevention and intervention programs. A review of the modified SaFETy tool did not extend clinic throughput time in any measurable capacity.

On the basis of the results of this study, where no patients were screened as high risk but the majority were screened as medium and low risk, a more sensitive tool specifically designed for primary settings with validation of new risk strata would be beneficial. It seems likely that clinically validated ED questionnaires such as the SaFETy tool are not sensitive enough to discern various levels of risk in a primary care setting even after modification. It may also be that highest-risk youth only interact with ED providers and do not interface with pediatric clinicians in the primary care setting,

**Table 1.** Sociodemographic Characteristics and Screening Frequency Among Adolescents Screened for Gun Violence Exposure

Characteristics (N=341)	n (%)
<b>Age</b>	
Median (years)	14
IQR (25th–75th)	3 (13–16)
<b>Sex</b>	
Female	173 (50.7)
Male	168 (49.3)
<b>Race/ethnicity</b>	
Asian or Pacific Islander	1 (0.003)
Hispanic	201 (58.9)
Non-Hispanic Black	129 (37.8)
Non-Hispanic White	9 (2.6)
Other <sup>a</sup>	1 (0.003)
<b>Insured</b>	
Yes	328 (96.2)
<b>Mental/behavioral health diagnosis (n=137)</b>	
ADHD	32 (23.4)
Anxiety	29 (21.2)
Behavioral/conduct disorder	23 (6.7)
Depression	46 (33.6)
Other <sup>b</sup>	128 (93.4)
<b>Physical health diagnosis (n=249)</b>	
Asthma	52 (20.9)
Obesity	139 (55.8)
Other <sup>c</sup>	171 (68.7)
<b>SaFETy screening questions (score contribution)</b>	
In the past 6 months, how often did you get into a physical fight?	
Never (0)	288 (84.5)
Once or twice (1)	46 (13.5)
3–5 times (2)	0
6 or more times (4)	7 (2.1)
In the past 6 months, how many of your friends have carried a knife, razor, gun, or other weapon?	
None or some (0)	338 (99.1)
Many, most or all (1)	3 (0.01)
In the past 6 months, how often have you heard guns being shot?	
None, once or twice, a few times (0)	291 (85.3)
Many times (1)	50 (14.7)
In the past 6 months, how often has someone pulled a gun on you?	
Never (0)	335 (98.2)
Once (3)	6 (0.02)
Twice or more (4)	0
<b>SaFETy risk (score)</b>	
Low risk (0)	251 (73.6)
Medium risk (1–5)	
1	62 (18.1)
2	14 (4.1)
3	3 (0.9)
4	9 (2.6)
5	2 (0.6)

(continued on next page)

**Table 1.** Sociodemographic Characteristics and Screening Frequency Among Adolescents Screened for Gun Violence Exposure (*continued*)

Characteristics (N=341)			n (%)
High risk ( $\geq 6$ )			0
Mean: 0.43	SD: 0.90	Median: 0	Range: 5

<sup>a</sup>Other racial/ethnicity included unknown or not specified.

<sup>b</sup>Other behavioral or mental health conditions than ADHD, anxiety, behavioral/conduct disorder, or depression.

<sup>c</sup>Other chronic medical conditions than asthma or obesity.

ADHD, attention-deficit/hyperactivity disorder.

potentially leading to challenges in identifying and providing resources for higher-risk youth.<sup>11</sup> Because previous work has focused on assessing a homogeneous high-risk youth population presenting to the ED with known exposure to community gun violence, there is a need to develop strategies to evaluate and manage youth at heterogeneous gun violence exposure risk levels (direct and indirect exposure) to support the well-being of all youth.

Despite the sensitive nature of discussions surrounding gun violence exposure, 98.8% of youth who completed the anonymous postsurvey questionnaire revealed that they responded genuinely to the initial questionnaire. By leveraging the patient–clinician relationship, pediatricians can initiate conversations to address community violence and likely other sensitive public health topics that can be screened for and intervened upon.

### Limitations

This study was limited because measuring the long-term success of referrals was outside the scope of this screening-centered research study. However, assessing the subjective experiences, barriers to access, and successes of referred youth are important avenues for future investigation and will further describe the impact of screening and referral processes. Our study initially screened all patients seen by 1 clinician during the initial month of implementation before the pilot was rapidly expanded to all 6 clinicians. As a result, 341 of all 508 eligible youth over the study period completed the survey. Although the initial unscreened group of patients ( $n=167$ ) only went unscreened because their clinicians were in the process of joining the pilot project during its expansion, it is not expected that bias was introduced or that these patients who were unable to be screened during the first month were significantly different from the rest of the screened population included in the study.

### CONCLUSIONS

Stratifying youth risk exposure to gun violence or progression to a high-risk category may provide new

avenues for intervention. Neighborhoods and communities at high risk of gun violence exposure, particularly in Chicago, have often been historically disadvantaged along several interdependent systems of discrimination.<sup>12</sup> This was reflected by our findings where most of the adolescents identified as part of a minority and had an existing mental or physical illness diagnosis. Additional work exploring the trauma and physical and mental health outcomes associated with community gun violence exposure among youth and experiences of other adversities known to be associated with negative physical and mental health outcomes (i.e., poverty, racial discrimination, parental incarceration, and parental mental illness) is warranted.<sup>13,14</sup> This can inform broader community-based strategies connecting youth and families to supportive prevention resources that help to intervene and improve the overall well-being of youth experiencing gun violence and other adversities.

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### CREDIT AUTHOR STATEMENT

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