Weapon Carrying among Inner-City Junior High School Students: Defensive Behavior vs Aggressive Delinquency

ABSTRACT

Objectives. The purpose of this study was to estimate associations between beliefs and experiences hypothesized to be related to weapon carrying among youths.

Methods. Students in two inner-city junior high schools completed anonymous questionnaires. Logistic regression models were fit for having ever carried a weapon for protection or use in a fight and were stratified by sex and weapon type.

Results. Among males, 47% had carried knives and 25% had carried guns. Key risk factors for knife carrying were being threatened with a knife, getting into fights, and disbelief that having a weapon increases the carrier's risk of injury. Gun carrying was associated with having been arrested, knowing more victims of violence, starting fights, and being willing to justify shooting someone. Among females, 37% had carried a knife; knowing many victims of violence and being willing to justify shooting someone predicted knife carrying.

Conclusions. Knife carrying was associated with aggressiveness but did not appear to be related to serious delinquency. Gun carrying within this nonrandom sample appeared to be a component of highly aggressive delinquency rather than a purely defensive behavior. (*Am J Public Health.* 1993;83:1604–1608)

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Introduction

Weapon-related violence is a major health problem among adolescents in the United States. Homicide is the second leading cause of death for youths aged 15 through 19 years. Almost half of the Black males aged 15 through 19 who died in the United States in 1989 were murdered, typically with a gun.[1] Of the 2771 homicide victims aged 10 to 19 years in 1989, 80% were killed with guns and 10% were stabbed to death.[1] Firearm homicide rates for Black males aged 10 through 19 years increased by 140% from 1979 to 1989.[1,2]

Youths are often perpetrators of violence as well as its victims. Nationwide, 17% of all persons arrested for violent crimes in 1991 were younger than 18 years of age.[3] Juvenile arrests for serious violent offenses have increased dramatically since the mid-1980s; these increases have coincided with a sharp rise in juvenile arrests for weapon carrying.[4]

A higher incidence of gun carrying among youths has been implicated as a key factor contributing to recent increases in youth violence.[4] National survey data on high school students revealed a monthly prevalence of weapon carrying of 20% in 1990.[5] Weapon carrying prevalence was highest among Black (39%) and Hispanic (41%) males. Twenty-one percent of Black males reported that they had carried a gun over the past month. A recent survey conducted in 10 selected inner-city high schools in four states found that 35% of male students and 11% of female students reported carrying a gun.[6]

Because weapon carrying can increase risks both to the individual carrying the weapon[7,8] and to others,[9] reducing weapon carrying among adolescents is among the national health objectives for the year 2000.[10] Yet little is known about the determinants of weapon carrying among adolescents. Data from a survey of inner-city high school students in the Midwest[11] and a focus group study in Dade County, Florida,[12] suggest that gun carrying is motivated by a belief that carrying a gun provides protection against being "jumped." Other studies have found weapon carrying among youths to be highly correlated with serious criminal activities.[6,13,14]

In the present study we assess the relationship between weapon carrying and a variety of personal factors hypothesized to be related to weapon carrying within a nonrandom sample of students attending two public junior high schools in Washington, DC. Weapon carrying was hypothesized to be a function of seven related factors: (1) first- and second-hand exposure to violence; (2) delinquent activities; (3) beliefs about the acceptability of hitting someone under certain conditions; (4) beliefs about the acceptability of shooting someone under certain conditions; (5) perceived peer support of violence; (6) aggressive behavior patterns; and (7) the belief that having a weapon can provide effective protection against an attack.

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Methods

Study Participants and Data Collection

As part of a larger study to evaluate the effects of a youth violence prevention program, baseline data were collected in two public junior high schools in Washington, DC. In school A, seventh-grade students enrolled in compulsory drug education classes were surveyed in the spring and fall of 1991. Students in school B were enrolled in eighth-grade social studies classes and were surveyed in the fall of 1991. School A is located in the central part of the city, an area that has a relatively high crime rate. School B is located in the southeastern part of the city, which has the highest concentration of poverty and crime. More than 95% of the students in each school were Black.

Students were instructed not to write their names on the questionnaires to protect the anonymity of their responses and were assured that only the research team would see their responses. In the classroom, as students read and completed the questionnaires, each question was read aloud by a member of the research staff.

Measures

The prevalence and frequency of weapon carrying was assessed with two sets of nested questions. For both guns and knives, students were asked, "Have you ever carried a gun (knife) with you for protection or to use in case you get into a fight? If your answer is yes, how many times would you say that you carried a gun (knife) for protection during the past 2 weeks?"

Three of the hypothesized risk factors for weapon carrying were measured by scales. The Hitting Acceptable scale was based on the sum of three attitudinal items, each with a 6-point Likert-scale response indicating level of agreement or disagreement with a statement pertaining to circumstances under which hitting someone was justified. The Shooting Acceptable scale was the sum of the responses to two items concerning conditions under which shooting someone was believed to be justified. A third scale, Image/Norms, included six items related to concerns about self-image and perceived peer norms pertaining to aggression. The internal consistency of these attitudinal scales was generally good (Hitting Acceptable $\alpha = .74$, Shooting Acceptable $\alpha = .55$, Image/norms $\alpha = .78$).

Data Analysis

Bivariate associations between ever having carried a weapon and dichotomous independent variables were measured by unadjusted odds ratios for which 95% confidence intervals were calculated. Differences in means for continuous independent variables were assessed by means of Student's t test.

Logistic regression analysis was used to assess the effects of each independent variable while controlling for other variables in the models. Interaction terms were included in the model if there was some theoretical rationale for the interaction and if the Wald statistic for the term was significant at the .05 level.

Three measures of model fit were used: the deviance statistic (D), the Pearson chi-square goodness-of-fit statistic (GOF χ^2), and Hosmer and Lemeshow's G^*_y statistic.[15,16] Model coefficients, B_i, were transformed (e^{Bi}) so that they could be interpreted as adjusted odds ratios, and 95% confidence intervals were calculated for each e^B. Each variable's contribution to the prediction of weapon-carrying status was measured by the partial correlation coefficient R.

Results

Profile of Respondents

Data on knife or gun carrying were available for 294 of the 295 respondents, all of whom were Black. Compared with respondents in school B, school A respondents were 1 year older on average (mean = 14.2 years, range = 12.9–16.7, vs mean = 13.3 years, range = 11.1–16.0; $t = 5.78$, $P < .001$) and somewhat less likely to live with their father or stepfather (27% vs 39%, $\chi^2 = 2.23$, $df = 1$, $P = .14$).

Prevalence and Frequency of Weapon Carrying

Nearly half of the males reported carrying knives for protection or to use in case they got into a fight (Table 1). The prevalence of ever carrying a gun among males was 23% in school A and 40% in school B. Knife carrying was also more prevalent among females in school B (67%) than in school A (31%).

Because the difference in the frequency of weapon carrying between schools among those who reported they had carried a weapon was not statistically significant, frequency data were combined across schools (Table 2). One of every five knife carriers carried a knife on a routine basis (from 8 through 14 days during the previous 2 weeks), whereas 16% of male gun carriers carried guns routinely.

TABLE 1—Percentage of Students Reporting Ever Having Carried a Weapon for Protection or for Use if in a Fight, by Sex, Grade, and Weapon Type

		Knife		Gun	
Grade	School	%	n	%	n
Males					
Seventh	A	48	66/138	23	32/141
Eighth	B	45	9/20	40	8/20
Females					
Seventh	A	31	35/112	4	5/112
Eighth	B	67	14/21	5	1/21

TABLE 2—Frequency of Reported Weapon Carrying Over Previous 2 Weeks, by Sex and Weapon Type, among Students Who Had Ever Carried a Weapon for Protection

	No. Days							
	0		1–3		4–7		8–14	
	%	n	%	n	%	n	%	n
Carried knife								
Males	21	15	34	25	26	19	19	14
Females	15	7	53	25	11	5	21	10
Carried gun								
Males	26	10	37	14	21	8	16	6

Bivariate Associations

Among males, having been arrested, having been threatened or attacked with a weapon, and getting into fights were all associated with increased odds of having carried a knife (Table 3). Lack of belief that weapon possession increases one's risk of being injured or killed, evident in 55% (87/157) of male respondents, was associated with knife carrying. Compared with other males, those who had carried knives knew more people who had been injured or killed by violence (mean = 6.7 vs 4.2, $t = 2.08$, $P = .04$). Males who carried knives had higher scores on the Hitting Acceptability scale ($t = 2.92$, $P = .004$), but did not differ from other males on either the Shooting Acceptability scale ($t = 0.33$, $P = .74$) or the Image/norms scale ($t = 1.55$, $P = .12$).

TABLE 3—Bivariate Associations between Ever Having Carried a Knife and Experiences with Violence, Seventh- and Eighth-Grade Males

	Ever Carried Knife		Odds Ratio	95% Confidence Interval
	%	n		
Ever been arrested				
Yes	66	25/38	2.73	1.28, 5.85
No	41	50/121		
Been threatened/attacked with knife				
Yes	74	34/46	4.89	2.27, 10.50
No	37	40/109		
Been threatened/attacked with gun				
Yes	65	26/40	2.71	1.29, 5.70
No	41	48/118		
Fought in past 4 weeks				
Yes	67	29/43	3.22	2.21, 4.70
No	39	45/115		
More likely than classmates to fight				
Yes	63	32/51	2.51	1.26, 4.99
No	40	43/107		
Start fights				
Yes	42	8/19	0.83	0.31, 2.19
No	47	64/137		
Believe having a weapon increases injury risk				
Yes	34	24/70	0.39	0.20, 0.75
No	58	50/87		

TABLE 4—Bivariate Associations between Ever Having Carried a Knife and Experiences with Violence, Seventh- and Eighth-Grade Females

	Ever Carried Knife		Odds Ratio	95% Confidence Interval
	%	n		
Ever been arrested				
Yes	75	9/12	6.55	1.68, 25.56
No	31	38/121		
Been threatened/attacked with knife				
Yes	73	19/26	7.56	2.87, 19.91
No	26	28/106		
Been threatened/attacked with gun				
Yes	71	12/17	5.65	1.84, 17.27
No	30	34/114		
Fought in past 4 weeks				
Yes	68	21/31	6.38	2.65, 15.37
No	25	25/101		
More likely than classmates to fight				
Yes	66	21/32	5.51	2.34, 12.96
No	26	26/101		
Start fights				
Yes	38	3/8	1.09	0.25, 4.78
No	35	44/124		
Believe having a weapon increases injury risk				
Yes	32	20/62	0.74	0.36, 1.52
No	39	27/69		

The same general pattern of bivariate associations with knife carrying emerged for females and males; however, these associations were somewhat stronger for females (Table 4). The exception to this pattern was a lack of association between knife carrying and belief that having weapons increases one's risk of being injured or killed. On average, females who carried knives knew more than twice as many victims of violence as did other females (mean = 7.9 vs 3.5, $t = 4.85$, $P < .001$). In addition, females who carried knives had higher scores on the three attitudinal scales.

The odds of ever having carried a gun were 7.7 times higher among males with an arrest history (weapon-carrying offenses excluded) than among males who had never been arrested (Table 5). All nine males who had been arrested for drug violations reported having carried a gun. A tendency to fight, including starting fights, was also related to having carried a gun, as was having been threatened or attacked with a gun. Males who carried guns knew more victims of violence than did males who did not carry guns (mean = 9.53 vs 4.44, $t = 2.82$, $P = .007$). Gun carriers also had higher scores on all three attitudinal scales.

Multivariable Analysis

The adjusted odds ratios derived from the logistic regression models for having carried a knife are presented in Table 6. For males, the strongest predictors for having carried a knife were having been threatened or attacked with a knife, disbelief that having weapons increases injury risks, and being more likely than classmates to get into fights but not usually being the one to start fights.

Estimates from the model for having carried a knife were markedly different for females. The 95% confidence limits for the adjusted odds ratios for only two predictors did not include 1.0. Belief in the acceptability of shooting someone under certain circumstances was the strongest predictor of knife carrying among females. After the other factors in the model were controlled for, each additional victim of violence known by the respondent was associated with a 19% increase in the odds of knife carrying.

Having been arrested was the single best predictor of having carried a gun for males (Table 7). The odds of having carried a gun were considerably elevated among males reporting the most aggressive behavior patterns (i.e., being more likely than classmates to participate in and to initiate fights). Believing that shooting someone is justifiable under certain circumstances and perceiving peer acceptance of violence were also positively associated with gun carrying. After other factors in the model were controlled for, neither having been threatened or attacked with a gun nor disbelief that having

a weapon increases injury risk was significantly related to gun carrying. (Note: One case was removed from the model because of the extreme effect it had on the estimates and the model's fit. The case removed was a respondent who reported having carried a gun, but had never been arrested or threatened with a gun, and who was less inclined to get into or start fights. Removing this case improved the fit of the model dramatically. For example, the G^*_y for the model with the outlier was 25.10 (df = 11, p = .01) compared to 4.96 (df = 11, p = .93) without the outlier. Most estimates increased when the case was removed.)

Discussion

Weapon carrying was alarmingly common among this convenience sample of inner-city seventh- and eighth-grade students. Our findings indicate that risk factors for weapon carrying varied by sex and weapon type. Among males, knife carrying was strongly related to aggressive behavior tendencies and the belief that having a weapon does not increase one's risk of being injured by violence. Having been threatened or attacked with a knife was an important predictor of knife carrying among males. This may be more indicative of respondents' propensity to get into fights with others who carry knives than of random victimization.

The beliefs and behaviors of males who carried knives tended to be aggressive; unlike gun carriers, however, they were not at the outer extremes on these measures. Gun carrying was also strongly linked with indicators of serious delinquency. Most males who had been arrested had also carried a gun and all who had been arrested on drug-related charges had carried a gun. The associations between gun carrying and the number of victims of violence known, and the perception of peer support for violence, suggest that gun carrying is partially determined by the degree to which a youth's social network is involved in, and supportive of, violence. These socioenvironmental factors are also likely to support the most extreme attitudes and behaviors related to violence that legitimize gun carrying and use. Willingness to justify shooting someone and a tendency to start fights are examples.

Our findings are not consistent with the image of otherwise law-abiding youths carrying guns solely for protection. Neither the belief that having weapons increased one's risk of being killed or injured by violence nor having been attacked or threatened with a weapon was significantly related to gun carrying after other factors in the model were controlled for. As was the case in other recent studies,[6,13,14] gun carrying could more realistically be explained as a part of an extremely aggressive, rather than defensive, system of thought and behavior.

Because respondents were not asked directly why they chose to carry a weapon, motivations for weapon carrying can only be inferred from the relationships between the hypothesized predictors and weapon carrying. The validity of self-reported motives for weapon carrying, however, is unknown and may well be poor.

TABLE 5—Bivariate Associations between Ever Having Carried a Gun and Experiences with Violence, Seventh- and Eighth-Grade Males

	Ever Carried Gun		Odds Ratio	95% Confidence Interval
	%	n		
Ever been arrested				
Yes	57	21/37	7.73	3.51, 17.51
No	14	18/124		
Been threatened/attacked with knife				
Yes	33	15/45	2.05	0.94, 4.44
No	20	22/112		
Been threatened/attacked with gun				
Yes	44	17/39	3.26	1.67, 8.10
No	17	21/121		
Fought in past 4 weeks				
Yes	38	16/42	2.54	1.18, 5.50
No	19	23/118		
More likely than classmates to fight				
Yes	45	23/51	4.72	2.20, 10.15
No	15	16/108		
Start fights				
Yes	53	10/19	4.57	1.69, 12.35
No	20	27/138		
Believe having a weapon increases injury risk				
Yes	21	15/71	0.77	0.53, 1.12
No	28	24/87		

TABLE 6—Logistic Regression Model for Ever Having Carried a Knife for Protection or for Use in a Fight

	Males			Females		
Independent Variable	aOR	95% CI	*R*	aOR	95% CI	*R*
School B/eighth grade	1.45	0.42, 6.43	.000	3.24	0.85, 12.8	.076
No. victims known	1.05	0.98, 1.12	.027	1.19	1.05, 1.34	.178
Threatened/attacked with knife	5.74	2.11, 15.6	.223	2.20	0.46, 10.6	.000
Hitting Acceptable index	1.33	1.09, 1.62	.172	1.15	0.92, 1.44	.000
Shooting Acceptable index	0.86	0.70, 1.05	−.038	1.54	1.16, 2.04	.207
Image/Norms index	0.91	0.81, 1.01	−.078	1.15	0.98, 1.34	.076
More likely to fight and others start fights	5.67	1.97, 16.3	.206	3.10	0.80, 12.1	.063
Less likely to fight and starts fights	1.83	0.19, 18.2	.000	0.60	0.03, 11.0	.000
More likely to fight and starts fights	0.53	0.10, 2.80	.000	0.10	0.01, 1.85	.000
Ever been arrested	1.81	0.65, 5.04	.000	5.01	0.33, 75.7	.000
Disbelief that having a weapon increases injury risks	4.70	1.83, 12.1	.206	1.29	0.42, 3.91	.000
Goodness of fit	$G^*_y = 20.10$, $df = 11$, $P = .03$ $D = 140.36$, $\chi^2 = 129.26$, $df = 129$			$G^*_y = 14.70$, $df = 11$, $P = .19$ $D = 91.16$, $\chi^2 = 126.57$, $df = 115$		

Note. aOR = adjusted odds ratio; CI = confidence interval.

TABLE 7—Logistic Regression Model for Ever Having Carried a Gun for Protection or for Use in a Fight, Seventh- and Eighth-Grade Males

Independent Variable	Odds Ratio	95% Confidence Interval	R
School B/eighth grade	1.46	0.19, 11.13	.000
No. victims known	1.13	1.04, 1.22	.194
Threatened/attacked with gun	3.60	0.92, 14.15	.095
Hitting Acceptable index	0.77	0.58, 1.03	−.086
Shooting Acceptable index	1.57	1.15, 2.16	.198
Image/Norms index	1.24	1.06, 1.45	.190
More likely to fight and others start fights	7.80	0.67, 90.67	.067
Less likely to fight and starts fights	2.60	0.11, 30.27	.000
More likely to fight and starts fights	51.50	4.46, 594.1	.228
Ever been arrested	16.05	3.78, 68.24	.281
Disbelief that having a weapon increases injury risk	1.95	0.46, 8.37	.000

Note. $G^2_y = 4.96$, $df = 11$, $P = .94$; $D = 73.00$, $\chi^2 = 89.38$, $df = 130$.

Inferences based on empirical relationships between weapon carrying and suspected determinants may provide a better understanding of this key risk factor for violence.

This study is limited by its inclusion of only two junior high schools in high-crime neighborhoods in Washington, DC, and by its cross-sectional design. Additional studies are needed to determine how well these findings generalize to other youth populations. The findings also may not accurately characterize the determinants of weapon carrying among older adolescents. Although gun carrying among junior high school students appears to be primarily a function of criminal deviance and aggressive tendencies, less deviant and aggressive adolescents may later decide to start carrying guns purely for reasons of self-defense. The time sequence and causal relationships among weapon carrying and its correlates should be further delineated with longitudinal studies.

Greater insight into the determinants of weapon carrying could also come from studies that measure an array of attitudes about weapons. For example, under what circumstances do youths believe carrying a weapon is warranted? What do they think their peers think about weapon carrying, and how does this affect their decisions about whether or not to carry weapons? What fears or concerns do youths have about carrying weapons?

Provided that our findings are nominally generalizable, they may have important implications for the prevention of gun carrying among junior high school students. If gun carrying stems largely from antisocial attitudes and behaviors rather than from purely defensive motives of otherwise nonviolent youths, interventions designed to prevent delinquency may be more effective than those that focus only on educating youths about risks associated with carrying a gun. The latter may, however, be able to deter less hardened youths from carrying weapons in the future. Intensive and comprehensive interventions directed at high-risk children could possibly "inoculate" children against the many social factors that foster criminal deviance and the most violent behavior patterns.

Our study focused on individual-level determinants of weapon carrying, but the strongest determinants may be at the community or societal levels (e.g., availability of handguns, joblessness, lack of family supports, glamorization of violence). Inattention to social conditions that engender the desire, and the means, for youths to acquire guns will severely limit the effectiveness of interventions intended to change youths' attitudes and behaviors with respect to weapons. □

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