

ORIGINAL ARTICLE

Youth Violence Perpetration: What Protects? What Predicts? Findings from the National Longitudinal Study of Adolescent Health

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Purpose: To identify individual, family and community-level risk and protective factors for violence perpetration in a national sample of adolescents.

Methods: Analysis of two waves of data from the National Longitudinal Study of Adolescent Health. The key outcome variable was Time 2 violence involvement, approximately 1 year after initial data collection, measured by a validated scale of violence perpetration

Results: Controlling for demographic covariates in multivariate regression models, key Time 1 protective factors against Time 2 violence perpetration included measures related to parental expectations, connectedness with parents and other adults, and school, higher grade point average and religiosity. Significant predictive risk factors included a history of violence involvement and violence victimization, weapon carrying, school problems, substance use, health problems, and friend suicide. Probability profiles then assessed the ability of protective factors to offset known risk factors for violence. For both girls and boys there were substantial reductions in the percentage of youth involved in violence in the presence of protective factors, even with significant risk factors present.

Conclusions: Findings support the utility of a dual strategy of reducing risk factors while enhancing protective factors in the lives of adolescents. © Society for Adolescent Medicine, 2004

KEY WORDS:

Adolescents
Violence perpetration
Gender differences
Risk and protective factors

Young peoples' involvement in violence perpetration has shown mixed trends over the past decade, depending on the specific measures used [1,2]. Utilizing data from the Centers for Disease Control and Prevention's Youth Risk Behavior Surveys, there were patterns of decline across most indicators from 1997 to 1999 to 2001 regarding the proportion of youth who reported carrying a gun within the past month (7.9%, 4.9%, 5.7%, respectively) or carrying a weapon on school property (11.8%, 6.9%, 6.4%, respectively); the proportion of those involved in a physical fight during the preceding year (42.5%, 35.7%, 33.2%, respectively), and those involved in a physical fight on school property, again, within the past year (16.2%, 14.2%, 12.5%, respectively). There was little change in the proportion of youth who felt, over the past month, it was too unsafe to go to school (ranging from 4.0% to 6.6%), or who threatened or injured someone with a weapon on school property within the past year (7.3% to 8.9%) [2,3].

Data from the Office of Juvenile Justice and Delinquency Prevention show that over the course of two decades, juvenile arrest rates for murder more than doubled from 1987 to 1993, then dropped by 52% between 1993 and 1998 [4]. For the first year in almost a decade, in 1995 the number of juvenile arrests for offenses included in the Violent Crime Index declined [5]. Collectively, this sampling of

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indicators points to encouraging trends amidst overall levels of violence involvement among young people that are disturbingly high.

Over the past decade, youth-focused research and programmatic interventions have increasingly turned attention to the enhancement of protective factors: the events, opportunities and experiences in the lives of young people that diminish or buffer against the likelihood of involvement in behaviors risky to youth and/or to others [6]. Recent syntheses of 'lessons learned' in violence prevention [7] have urged both researchers and practitioners to examine the process of healthy youth development and to identify key protective factors that warrant attention throughout adolescence. Similar emphasis on the need to further explore protective factors as well as risk factors for violence is evident in the Surgeon General's report on youth violence [8].

Building upon these recommendations, the goal of this study was to examine risk and protective factors for youth violence utilizing longitudinal data from the National Longitudinal Study of Adolescent Health (Add Health). Specifically, this analysis sought to identify risk and protective factors for violence perpetration among girls and boys, assessing the extent to which individual, family, and community-related variables at Time 1 could predict interpersonal violence involvement at Time 2, approximately 1 year later.

Methods

The Add Health Design

The Add Health design has been described elsewhere in greater detail [9–11]. Add Health is a longitudinal study of 7th–12th grade adolescents in the United States (U.S.), focusing on health-related behaviors and the social contexts in which they live. All high schools in the U.S. that had an 11th grade and a minimum of 30 enrollees in the school were included in the primary sampling frame ($N = 26,666$). A systematic random sample of 80 high schools was selected proportional to enrollment size, stratified by school type, urbanicity, region, and percentage white. For each of these high schools the primary feeder school that included 7th grade was recruited. High schools that spanned grades 7–12 were used as their own feeder school. The final sample was comprised of 134 schools.

Of the 119,233 eligible students in grades 7–12, 90,118 respondents completed an in-school survey between September 1994 and April 1995. One hun-

dred sixty-four school administrators also completed a survey describing school policies and climate, student body characteristics, and the provision of health services within the school. From the list of in-school survey participants and from school rosters, a core random sample stratified by grade and gender with special oversamples of adolescents, (e.g., African-American youth with one or both parents who had a college degree) was selected for in-home interviews. The first wave (Time 1) of the in-home interviews was conducted from April to December 1995. The 90-minute computer-assisted interview was completed by 20,745 students and included a wide range of questions on health, risk behaviors, protective factors, family dynamics, adolescents' attitudes and expectations. Sensitive components of the interview were delivered through earphones with responses entered directly into a laptop computer. Such an approach has been shown to maximize validity of response among adolescents [12].

From this in-home sample, 14,738 teens completed the second wave of interviews (Time 2) conducted between April and August 1996. The mean interval between Time 1 and Time 2 data collection was 11.0 months (95% confidence interval: 7.6–14.3 months) [9]. Students in the 12th grade at Time 1 were not interviewed at Time 2. All study protocols received Institutional Review Board approval. Extensive arrangements, including signed contractual agreements by investigators with access to the data, were taken to protect confidentiality and to preclude deductive disclosure of students' identities.

Study Sample and Measures

For this analysis, the sample was comprised of adolescents from the core sample and from the special oversamples, who completed an interview at both Time 1 and Time 2 ($n = 13,110$). The Time 2 outcome variable of interpersonal violence perpetration was based on a scale measuring involvement in various aspects of violent behavior. The items comprising the scale included the following:

In the past 12 months how often did you: use or threaten to use a weapon to get something from someone?; take part in a group fight?; pull a knife/gun on someone?; shoot/stab someone?; get into a serious physical fight?; get in a fight where you were injured and had to be treated by a doctor or nurse?; hurt someone badly enough to need bandages or care from a doctor or nurse? The overall Cronbach alpha for this scale is 0.83. Internal consistency

measures for this scale by gender and by grade are described in greater detail elsewhere [9,11].

The predictors of interpersonal violence perpetration, conceptualized as risk and protective factors, were derived from a resiliency framework that proposes that young peoples' susceptibility to health-compromising behaviors and adverse outcomes are influenced by the number and specific nature of stressors they face as well as by the presence of protective factors that can offset the deleterious effects of risk factors [9–11,13–19]. These risk and protective factors, grounded in both the theoretical and empirical resiliency literature, were organized as community, family, and personal factors as described in the initial analyses of risk and protective factors in Add Health [9]. In this conceptualization, community factors also included school-related variables, as schools often constitute the primary community of identification for young people [10].

Statistical Analysis

All analyses used sampling weights to adjust for stratification and oversampling of underrepresented groups, with adjustment of weights within the gender and race/ethnic strata so that the sum of the weights totaled correct sub-sample size. Consequently, the sample may be regarded as nationally representative of adolescents in grades 7 through 12. We further adjusted these weights within the gender strata so that the sum of the weights totaled to the correct sub-sample size. Initial analyses used Chi-square to examine the relationship between a dichotomized "never" vs. "ever" violence perpetration measure and the risk and protective factors within the dataset that were consonant with the resiliency paradigm, and with prior empirical results that tested cross-sectional associations of risk and protective factors with a variety of adolescent risk behaviors [6,9,19].

The violence scale was highly non-normal (skewness = 4.19) so we explored several transformations, evaluating them by the skewness of their residuals. The log-log transformation performed best; its residuals had a skewness of 1.84. However, this meant that the parameter estimates do not retain their usual interpretation and their magnitudes appear diminished. Hence, multivariate associations were evaluated using the corresponding *t* statistics and their *p* values. We used a mixed effects linear regression model to account for the clustered sampling plan, treating the community variable (COMMID) as the random effect. Chunkwise regression was performed

to reduce the number of variables in the model [20]. The chunks were comprised of sets of personal variables, family and community variables. We used a backwards stepwise strategy and liberal criterion of $p = 0.10$ for initial variable retention. Owing to evidence of confounding effects across models, age, race, ethnicity, family composition, urbanicity and welfare status were retained in all regression models as background demographic factors [9].

Separate analyses were conducted by gender but not by race/ethnicity group to assure adequate power and stability of statistical estimates. In all analyses, Time 1 factors were used to predict the Time 2 outcome of interpersonal violence perpetration. Based upon previous Add Health analyses, items and scales were standardized for ease of interpretation by reducing the range of scales and nondichotomous items to approximately 1.00, achieved by restandardizing items to a mean of zero and a standard deviation of 0.25 [9,10].

Finally, patterned after group modeling of risk and protective factors for self-directed violence, probability profiles were developed to estimate the probability of involvement in violence perpetration at Time 2, using combinations of key risk and protective factors identified in prior analyses that were also amenable to intervention. Estimated probabilities of being in the top quintile of violent behavior were calculated when 0, 1, 2, or 3 protective factors were present, in combination with either no risk factors, or multiple risk factors. Variables used in these group-specific profiles were selected either based on their empirical salience, their relevance to program-based and clinical practice with young people, or both [9,10]. For the continuous variables, values representing the 10th and 90th percentiles for low and high levels, respectively, were incorporated into the profiles, again, based on prior analyses of key risk and protective factors for self-directed violence [10,15].

Results

The prevalence of endorsement of the individual Time 2 violence perpetration indicators ranged from less than 1% (shot/stabbed someone [females]) to more than one in four youth (serious physical fight [males]), as detailed in Table 1. Endorsement of any of the violence items included 22.5% of girls and 38.6% of boys. Bivariate T1 correlates of this outcome are reported separately in Tables 2, 3, and 4 for males and females.

Table 1. Number and Percent Endorsing T2 Violence Indicator by Gender

Item ($\alpha = 0.83$)	Male (n = 6913) n (%)	Female (n = 7419) n (%)
Use or threaten with a weapon	310 (4.5)	171 (2.3)
Take part in a group fight	1572 (23.0)	1064 (14.4)
Pull a knife/gun on someone	466 (6.8)	166 (2.2)
Shoot/stab someone	190 (2.8)	52 (0.7)
Get into a serious physical fight	1882 (27.4)	1040 (14.1)
Injured in a fight	370 (5.4)	196 (2.7)
Injured someone else in a fight	871 (12.7)	334 (4.5)
Positive response to any of the above violence items	2670 (38.6)	1673 (22.5)

For the T1 community factors, for both boys and girls, significantly lower proportions of respondents indicated T2 violence involvement when perceived connectedness with school as well as with adults outside of the family were high. Significantly more respondents indicated violence involvement when they perceived prejudice among students in their school, and when they reported having a friend who had attempted or completed suicide.

Among the family factors, protective associations were evident for both girls and boys for those reporting they were able to discuss problems with parent(s), when perceived parental expectations about school performance were high, when a sense of connectedness to family was high, when students reported frequent shared activities with parents, and when at least one parent was described as consistently present during at least one of the following times: when awakening, when arriving home from school, at evening mealtime, and when the respondent went to bed. Risk factors for T2 violence in-

volvement included T1 suicidal involvement of a family member and among boys when there was report of easy access to firearm(s) in the home.

Among individual level risk and protective factors, protective associations of T1 factors with T2 violence indicators for both girls and boys included religiosity (the valuing of religious observance and personal prayer), and high grade point average. The strongest associations among risk factors included involvement in violence perpetration at T1 as well as a history of violence victimization, high levels of emotional distress, and a number of school-linked behaviors/conditions including weapon carrying to school, skipping school, learning problems and repeating a grade. Higher self-esteem was also a risk factor, among girls only. Three risk factors for violence related to health status included high levels of somatic complaints, poor self-assessed general health, and a history of treatment for emotional problems. Four behavioral risk factors included the report of at least one prior suicide attempt, and

Table 2. Number and Percent of Youth Reporting Any T2 Violent Behavior^a

T1 Community Factors	Male		Female	
	n (%)	p Value	n (%)	p Value
School connectedness				
Top quartile	502/1697 (29.6)	.001	348/1864 (18.7)	.001
All others	1950/4643 (42.0)		1180/4946 (23.9)	
Perceived student prejudice				
Yes	1600/4036 (39.6)	.007	962/4481 (21.5)	.010
No	799/2207 (36.2)		530/2184 (24.3)	
Feels safe in neighborhood				
Yes	1000/2953 (33.9)	.001	644/3375 (19.1)	.001
No	368/834 (44.1)		294/1098 (26.8)	
Friend suicide				
Yes	431/843 (51.2)	.001	511/1642 (31.1)	.001
No	2032/5514 (36.9)		1027/5195 (19.8)	
Other adult connectedness				
Yes	1157/3294 (35.1)	.001	845/4120 (20.5)	.001
No	1290/3009 (42.9)		690/2672 (25.8)	

^a Percentages do not total 100 because not all respondents identify a T2 violent behavior.

Table 3. Number and Percent of Youth Reporting Any T2 Violent Behavior^a

T1 Family Factors	Male		Female	
	n (%)	p Value	n (%)	p Value
Easy access to gun in home				
Yes	771/1882 (41.0)	.013	281/1209 (23.2)	.506
No	1659/4408 (37.6)		1246/5570 (22.4)	
Discusses problems w/parent(s).				
Yes	1555/4231 (36.8)	.001	740/3470 (21.3)	.012
No	871/2040 (42.7)		781/3270 (23.9)	
Suicide of family member				
Yes	133/244 (54.6)	.001	131/368 (35.6)	.001
No	22935/6028 (38.1)		1384/6382 (21.7)	
Parental school expectations				
Top quartile	564/1792 (31.5)	.001	331/1914 (17.3)	.001
All others	1860/4474 (41.6)		1189/4813 (24.7)	
Family connectedness				
Top quartile	629/1919 (32.8)	.001	308/1888 (16.3)	.001
All others	1833/4426 (41.4)		1230/4942 (24.9)	
Parental presence				
Top quartile	677/1905 (35.5)	.001	378/1968 (19.2)	.001
All others	1754/4738 (40.1)		1142/4776 (23.9)	
Activities with parents				
Top quartile	928/2693 (34.5)	.001	536/2948 (18.2)	.001
All others	1497/3579 (41.8)		984/3792 (26.0)	

^a Percentages do not total 100 because not all respondents identify a T2 violent behavior.

frequent use of alcohol, marijuana, and/or other illicit drugs. Working 20 or more hours per week for pay during the school year was an associated risk factor among boys only.

Controlling for relevant demographic factors, significant multivariate risk and protective factors for T2 violence perpetration (using the scaled, continuous measure of violence involvement) are presented in Table 5 for males and Table 6 for females, rank ordered by salience of the T statistic (protective factors are noted).

Among boys and girls, by far the most salient predictors of violence perpetration were T1 violence involvement and a history of violence victimization. For males, repeating a grade and carrying a weapon to school were the next most salient predictors, followed by marijuana and alcohol use. A history of treatment for emotional problems as well as self-reported learning problems comprised the final significant predictors. Significant protective factors included level of parental expectations for school performance, the ability to discuss problems with parents, grade point average, and a sense of connectedness to adults outside of the family.

Among girls, in some instances significant risk and protective factors were different than those for boys. The most salient risk factors after T1 violence involvement and prior violence victimization in-

cluded carrying a weapon to school, alcohol use, and emotional distress. (The latter was not a significant risk factor for boys.) Marijuana use and having repeated a grade were the next most salient risk factors. Unique to the girls, somatic complaints were a risk factor, followed by learning problems. The most salient protective factors included grade point average. Unlike boys, family connectedness, religiosity and school connectedness showed significant protective effects, as well.

We next predicted the probabilities of perpetrating violence at Time 2 given various combinations of key risk and protective factors in each gender group. Risk factors in the probability profiles for both girls and boys included violence victimization and carrying a weapon to school. The common protective factor included grade point average. Other protective factors for boys included connectedness to adults outside the family, and parental expectations about school performance. Additional protective factors in the probability profile for girls included family connectedness and religiosity. Table 7 describes the predicted probabilities that adolescent boys and girls will be in the top quintile of violent behavior at Time 2 given various combinations of these risk and protective factors.

The predicted probability of being in the top quintile of violence perpetration among boys ranged

Table 4. Number and Percent of Youth Reporting Any T2 Violent Behavior^a

T1 Personal Factors	Male		Female	
	n (%)	<i>p</i> Value	n (%)	<i>p</i> Value
Religiosity				
Top quartile	425/1331 (31.9)	.001	313/1923 (16.3)	.001
All others	2034/5022 (40.5)		1225/4911 (24.9)	
Emotional distress				
Top quartile	574/1174 (48.9)	.001	626/1931 (32.4)	.001
All others	1888/5176 (36.5)		912/4896 (18.6)	
Self-esteem				
Top quartile	443/1133 (39.1)	.819	257/919 (28.0)	.001
All others	2018/5211 (38.7)		1279/5899 (21.7)	
T1 violence perpetrator				
Yes	1176/1736 (67.8)	.001	512/820 (62.4)	.001
No	1287/4621 (27.9)		1025/6017 (17.0)	
Victim of violence				
Top quartile	1220/1984 (61.5)	.001	522/1090 (47.9)	.001
All others	1219/4319 (28.2)		1007/5700 (17.7)	
GPA				
Top quartile	535/2015 (26.6)	.001	428/2823 (15.2)	.001
All others	1821/4145 (43.9)		1060/3796 (27.9)	
Cuts/skips school				
Top quartile	648/1221 (53.1)	.001	320/1002 (31.9)	.001
All others	1746/5022 (34.8)		1181/5692 (20.8)	
Learning problems				
Top quartile	904/1890 (47.8)	.001	436/1379 (31.6)	.001
All others	1499/4373 (34.3)		1066/5319 (20.0)	
Somatic complaints				
Top quartile	594/1228 (48.4)	.001	610/2166 (28.0)	.001
All others	1870/5130 (36.5)		927/4669 (19.9)	
Hours worked				
20+ h/week	487/1140 (42.7)	.002	200/937 (21.3)	.357
< 20 h/week	2154/5709 (37.7)		1454/6406 (22.7)	
Carried weapon to school				
Yes	575/900 (63.8)	.001	168/307 (54.7)	.001
No	1863/5394 (34.5)		1361/6480 (21.0)	
Treated emotional problems				
Yes	399/744 (53.7)	.001	297/928 (32.0)	.001
No	2059/5596 (36.8)		1238/5903 (21.0)	
Poor general health				
Top quartile	187/382 (49.0)	.001	167/547 (30.5)	.001
All others	2276/5975 (38.1)		1371/6290 (21.8)	
Repeated a grade				
Yes	778/1647 (47.2)	.001	384/1216 (31.6)	.001
No	1681/4700 (35.8)		1153/5617 (20.5)	
Suicide attempt				
Yes	80/151 (52.8)	.001	179/383 (46.7)	.001
No	2384/6205 (38.4)		1358/6453 (21.0)	
Alcohol frequency				
Top quartile	945/1834 (51.6)	.001	569/1802 (31.6)	.001
All others	1462/4426 (33.0)		954/4969 (19.2)	
Marijuana use				
Top quartile	933/1662 (56.1)	.001	520/1572 (33.1)	.001
All others	1439/4519 (31.9)		986/5144 (19.2)	
Other illegal drug use				
Yes	440/735 (59.8)	.001	302/779 (38.7)	.001
No	1977 (35.8)		1218/5991 (20.3)	

^a Percentages do not total 100 because not all respondents identify a T2 violent behavior.

Table 5. Multiple Linear Regression: Males

Variable	Estimate	T value	Pr > t
T1 violence involvement	.1848	20.29	< .001
Violence victim	.0565	6.34	< .001
Parental school expectations ^a	-.0326	-4.23	< .001
Repeated a grade	.0174	3.58	< .001
Weapon carrying school	.0202	3.33	< .001
Marijuana use	.0263	3.18	.002
Discuss problems w/parents ^a	.0175	2.93	.004
Alcohol use	.0273	2.90	.046
GPA ^a	-.0252	-2.88	.004
Other adult connectedness ^a	-.0255	-2.50	.012
Treated emotional problems	.0146	2.37	.018
Learning problems	.0180	2.10	.036

Adjusted R-squared = 0.31

^a Protective factors.

from 70.5% with all of the risk factors high and low levels of the protective factors, to 17.6% with none of the specific risk factors and high levels of the protective factors present. Among girls, that range of probabilities was 60.8% to 6.5% involved in the top quintile of violence perpetration at Time 2. With three protective factors present, the risk of being in the top quintile of violence perpetration among those with all of the risk factors present still dropped substantially among both males and females, with reductions of 28 to almost 40 percentage points. Among students without any of the identified risk factors, the presence of protective factors still decreased twofold the proportion of boys involved in the top quintile of T2 violence perpetration with a more than fourfold decline for girls.

Discussion

Can protective factors offset the deleterious effects of risk factors? In the 1980s there was a pronounced sentiment expressed in some political circles that little or nothing could be done with high-risk children, youth and families. In the 1990s this gave way to a more proactive perspective that posed the question: "What works, and what's the evidence?" [16]. In this national sample of students, an array of risk and protective factors, derived from theoretical and empirical studies of youth health and risky behaviors, were found to significantly increase or diminish the likelihood of involvement in serious violence perpetration approximately 1 year after baseline data collection.

Factors predictive of interpersonal violence perpetration across one or both of the gender groups, including perpetrating or experiencing violence,

weapon carrying, friend suicidal involvement, problems in school, poor physical and/or emotional health, and higher levels of alcohol and marijuana use have been described in other studies of youth, both cross-sectional and longitudinal [9,21-31]. Among the predictors, the self-report of perpetrating as well as experiencing violence are particularly salient. This affirms results in related literatures that emphasize the short- and long-term consequences of violence victimization on subsequent mental health and risk behaviors [32,33]. To be sure, some adolescents who experience violence do so because they are perpetrators; for some, violence victimization occurs because of an unsuccessful perpetration attempt. For others, victimization occurs in the sense that they witness or experience violence with no involvement in perpetration themselves [9].

There is continued evidence in this analysis of the interrelatedness of self-directed and interpersonal violence whereby suicidal involvement of young people and/or those close to them function to increase the risk of violence perpetration by adolescents [10]. This would suggest that self-directed and interpersonal violence have similar, underlying etiological elements [32,33], although cross-sectional analyses by Blum et al did not find this interconnection when comparing factors influencing suicide attempt and specifically, weapon-related violence perpetration [19].

Protective factors found in this analysis to diminish the risk of young people's involvement in interpersonal violence reflect broader findings related to prevention of suicide attempts, substance use, and other forms of adolescent risk-taking [33-42]. Other investigators have also noted the importance of car-

Table 6. Multiple Linear Regression: Females

Variable	Estimate	T value	Pr > t
T1 violence involvement	.2588	26.20	< .001
Violence victim	.0501	5.02	< .001
Weapon carrying school	.0300	4.76	< .001
Alcohol use	.0338	4.68	< .001
Emotional distress	.0266	4.36	< .001
GPA ^a	-.0244	-4.04	< .001
Marijuana use	.0177	2.71	.007
Family connectedness ^a	.0161	2.68	.007
Religiosity ^a	-.0155	-2.66	.008
Repeated a grade	.0099	2.46	.014
Somatic complaints	-.0136	-2.22	.026
Learning problems	.0180	2.10	.036
School connectedness ^a	.0121	2.02	.043

Adjusted R-squared = 0.29

^a Protective factors.

Table 7. Predicted Probabilities that an Adolescent Will be in the Top Quintile of Violent Behavior at Time 2

# of Protective Factors	Protective Factors ^a			Risk Factors ^b			
	Family/Adult Connectedness ^a	Religiosity, Parental Expectations ^a	Grade Point Average	All Low		All High	
				Boys %	Girls %	Boys %	Girls %
0	Low	Low	Low	40.9	28.6	70.5	60.8
1	High	Low	Low	33.6	22.2	63.5	52.5
1	Low	High	Low	38.6	19.3	68.4	48.1
1	Low	Low	High	24.4	14.1	52.6	38.8
2	Low	High	High	22.6	8.9	50.1	27.5
2	High	Low	High	19.0	10.5	44.7	31.1
2	High	High	Low	31.4	14.6	61.2	39.8
3	High	High	High	17.6	6.5	42.3	21.3

^a Protective factors: girls: family connectedness, religiosity, GPA; boys: adult connectedness, parental school expectations; GPA.

^b Risk factors: girls: carries a weapon to school, emotional distress, victim of violence; boys: repeated a grade, carries a weapon to school, victim of violence.

ing and connectedness with adults both within and outside of the family, the latter being particularly important for young people from families that may not be a strong source of nurturance and support [6,42,43]. A number of investigators have suggested that the quality of family dynamics, consistency of supervision, monitoring and expression of norms, values and expectations are far more important buffers against high-risk behaviors than family structure itself [33,44]. Other analyses of Add Health data also have demonstrated that family relationships and dynamics, as well as school and peer-related factors, are more potent explainers of participation in high-risk behaviors than are the broad demographic variables of family structure, social class, race and ethnicity [19].

Reflective of other studies of protective factors among adolescents, higher grade point average showed protective effects against violence for males and females [44–46]. Religiosity, here measured in terms of the personal importance ascribed to religious practice and prayer, showed protective effects only for females. This is generally consistent with other reports showing greater salience of religiosity as a protective factor for girls than for boys [10,30,46]. This kind of measure of religiosity has been long viewed as a proxy measure for holding conventional (vs. anti-social) attitudes, beliefs and norms, which have been shown to buffer against participation in numerous forms of risk-taking behavior [6,9,47–51].

Limitations

A few cautionary notes are in order. Because Add Health used a school-based design, findings are not

generalizable to out-of-school youth, for whom we might expect a higher overall prevalence of violence involvement [21,22]. Any secondary analysis will lack the full range of explanatory and predictive variables for any particular analysis; despite its comprehensiveness, Add Health is no exception.

Conclusion

The juxtaposition of risk and protective factors in studies of health-jeopardizing behaviors helps to identify potential areas of intervention, including among youth characterized by multiple risk factors [10,16,47,52]. The field of violence prevention is evolving rapidly toward a broader ecological perspective that identifies elements of risk and protection at the individual, family, school, and community levels [36,37,52–57]. For example, several initiatives from the Centers for Disease Control and Prevention include cooperative efforts between health departments, schools, and community partners intended to promote social and cognitive competence and enhance resiliency among young people [7]. A greater understanding of how the social contexts of youth contribute toward increased or diminished likelihood of violence involvement challenges adults working with and on behalf of youth to become more aware of and make use of resources that strengthen family functioning, enhance positive, pro-social relationships with other adults in the broader social network, and improve academic performance and a sense of connection with school [8,9]. This boosting of protective factors should be complemented by strategies aimed at reduction of risk factors and risky

behaviors predictive of violence such as weapon carrying, substance use, school problems, and physical and emotional distress. Likewise, health providers can address the deleterious effects of witnessing and experiencing violence and antecedent exposure to suicide attempts and completions among adolescents' friends or family. It is critical that service providers have the training and preparation to screen for violence-related factors as well as knowledge of clinical and community resources to affect an adequate response to the needs of patients. Through direct provision of services, anticipatory guidance, referral and advocacy efforts, health professionals and other adults can promote the dual strategy of risk-reduction and promotion of protective factors [16]. The growing weight of evidence suggests the utility of this approach in addressing a range of adolescent health-risking behaviors, including violence perpetration [16].

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