A Dating Violence Prevention Program for Middle School Youth: A Cluster Randomized Trial

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abstract

OBJECTIVES: We conducted a cluster randomized controlled trial to test the a priori hypothesis that students attending an intervention middle school would be less likely to report physical adolescent relationship abuse (ARA) 1 year later compared with students attending a control school. Secondary objectives were to determine if the intervention reduced substance misuse, bullying, and fighting.

METHODS: Twenty-four Texas public middle schools were matched by the size of student enrollment, number of economically disadvantaged students, and race and ethnicity of the student body and randomly assigned to the intervention ($n = 12$; 1237 participants) or the control ($n = 12$; 1531participants) group. The intervention, *Fourth R*, is a classroom-based curriculum delivered by existing teachers and consists of 21 lessons on injury prevention, substance use, and growth and development.

RESULTS: Participants (50% female) self-reported ethnicity as Hispanic or Latinx (35%), Black or African American (24%), Asian American (17%), White (8%), and multiethnicity or other (16%). Among those who have dated, students in the intervention schools were less likely to report perpetrating physical ARA (intervention = 14.9% versus control = 18.3%) relative to students in the control schools (adjusted odds ratio, 0.66; 95% confidence interval, 0.43–1.00; $P = .05$). In the overall sample, no significant differences emerged between control and intervention groups with respect to substance misuse, fighting, and bullying.

CONCLUSIONS: The middle school version of *Fourth R* is effective in reducing physical ARA perpetration over at least 1 year. The intervention did not have an effect on bullying perpetration, physical fighting with peers, and substance misuse. Long-term assessment, especially follow-up that covers the transition to high school, is needed to examine the program benefit on key outcomes.

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Drs Temple, Peskin, Wood, and Baumler conceptualized and designed the study, coordinated and supervised data collection, drafted the initial manuscript, and reviewed and revised the manuscript; Ms Thiel and Ms Torres designed the data collection instruments, collected data, and reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

This trial has been registered at the National Library of Medicine on September 21, 2016 (ClinicalTrials.gov identifier NCT02909673).

Deidentified data will be made available to researchers whose proposed use of the data has been approved for a specific purpose. Data will be available via https://dash.nichd.nih.gov/ beginning on June 30, 2022, with no expiration date.

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WHAT'S KNOWN ON THIS SUBJECT: The prevalence and negative consequences of adolescent relationship abuse make it a public health priority in need of efficacious preventive interventions. Accumulating evidence suggests that this form of violence can be prevented.

WHAT THIS STUDY ADDS: In the first randomized controlled trial of *Fourth R* in middle schools, we found that students in the intervention schools were less likely to report perpetrating physical adolescent relationship abuse (14.9%) compared with students in the control schools (18.3%).

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Adolescent relationship abuse (ARA), including physical, sexual, and psychological forms of violence, is a critical public health concern for adolescents, their families, and their communities. Approximately 10% to 20% of US adolescents report experiencing past-year physical or sexual ARA.[1,2] ARA has significant impacts across the life span, including increased risk for substance misuse, adverse mental and physical health outcomes, subsequent intimate partner violence victimization, academic disengagement and poor school performance, and economic instability into adulthood.[3,4] The high prevalence of ARA, associated risk behaviors, and negative lifetime impacts of victimization merit comprehensive strategies to prevent ARA, reduce revictimization, and address consequences.[5,6]

Adolescence is a developmental timespan marked by high risk for a range of experimental behaviors.[7] Onset of ARA perpetration typically occurs at or before age 15 for girls and at or before age 18 for boys, suggesting that prevention strategies may benefit from targeting early adolescence (ages 10–14).[8] Several risk and protective factors contribute to ARA, including alcohol and drug use, poor psychological health, violence within the family, witnessing intimate partner violence among parents, child maltreatment, alcohol and drug use, peer violence, bullying and homophobic teasing, and social and community norms that condone intimate partner violence and other types of violence.[9] Indeed, substance misuse is inextricably tied to ARA, sharing a multidirectional relationship, common risk and protective factors, and adverse health outcomes.[10]

Over the past 2 decades, several primary prevention strategies have been developed, implemented, and evaluated with the aim of reducing ARA rates by increasing healthy relationship skills, reducing risk factors, and bolstering protective factors. The most impactful of these are typically school-based and focus on universal middle and high school populations. For example, *Safe Dates*, a school-based prevention program for eighth- and ninth-graders, has demonstrated reductions in ARA perpetration and victimization as compared with control groups.[11] *Shifting Boundaries*, which focuses on middle school age participants with an emphasis on classroom and school community (building) level interventions, has evidenced reductions in sexual violence victimization and perpetration.[12] A recent cluster randomized controlled trial (RCT) of *Dating Matters*, a violence prevention program implemented in US middle schools, illustrated significant reductions in ARA and negative conflict resolution skills.[13] Another program, *Expect Respect*, is designed to prevent ARA and promote healthy relationship skills in high-risk groups of adolescents who have been exposed to violence in their homes. This program has revealed reductions in ARA perpetration and victimization, as well as reactive and proactive aggression.[14] *Real Talk*, a health care–based brief intervention, reduced physical dating violence perpetration among boys at 3 and 6 months postintervention.[15] Finally, *Me & You … Building Healthy Relationships*, a school-based program for predominantly ethnic-minority sixth-graders, demonstrated reductions in ARA perpetration when these students were followed into the seventh grade.[16]

Despite the strong shared risk and protective factors for ARA, substance misuse, and other peer violence, only 1 rigorously evaluated school-based prevention program focuses on these overlapping adolescent health concerns: the *Fourth R*. The *Fourth R* uses a social cognitive model to teach participants behavioral strategies in decision-making, nonaggressive conflict resolution, and self-efficacy to prevent ARA, substance misuse, and peer-directed aggression. A cluster RCT of the *Fourth R* in Canadian ninth-grade health classes revealed decreased physical ARA perpetration and increased condom use at 2.5 years follow-up.[17] Despite the strong evidence of effectiveness, the *Fourth R* has not previously undergone a rigorous RCT for US students or racially and ethnically diverse student populations, or been implemented in middle school classrooms. Given the knowledge that ARA and risky behaviors often begin before high school, we conducted a school-based cluster RCT to test our hypothesis that *Fourth R* reduces ARA, substance misuse, bullying, and fighting among US middle school (seventh grade) youth in a diverse area of Texas.

METHODS

In 2017, we recruited 24 Texas middle schools from 2 large urban school districts, with student recruitment and baseline survey occurring in January 2018, the intervention delivered during the 2018 spring semester, and a 1-year follow-up survey in spring 2019. All seventh-grade students attending study schools were eligible to participate ($n = 3738$; response rate = 74%); 82.5% of participants completed the follow-up assessment ($n = 2284$). Active parent or guardian consent and student assent were obtained before data collection.

Students in control schools received the standard seventh-grade health curriculum. Sample size ensured that there was adequate power to detect small-to-modest differences between study conditions for primary outcomes. As shown in Fig 1, schools were matched by the size of student

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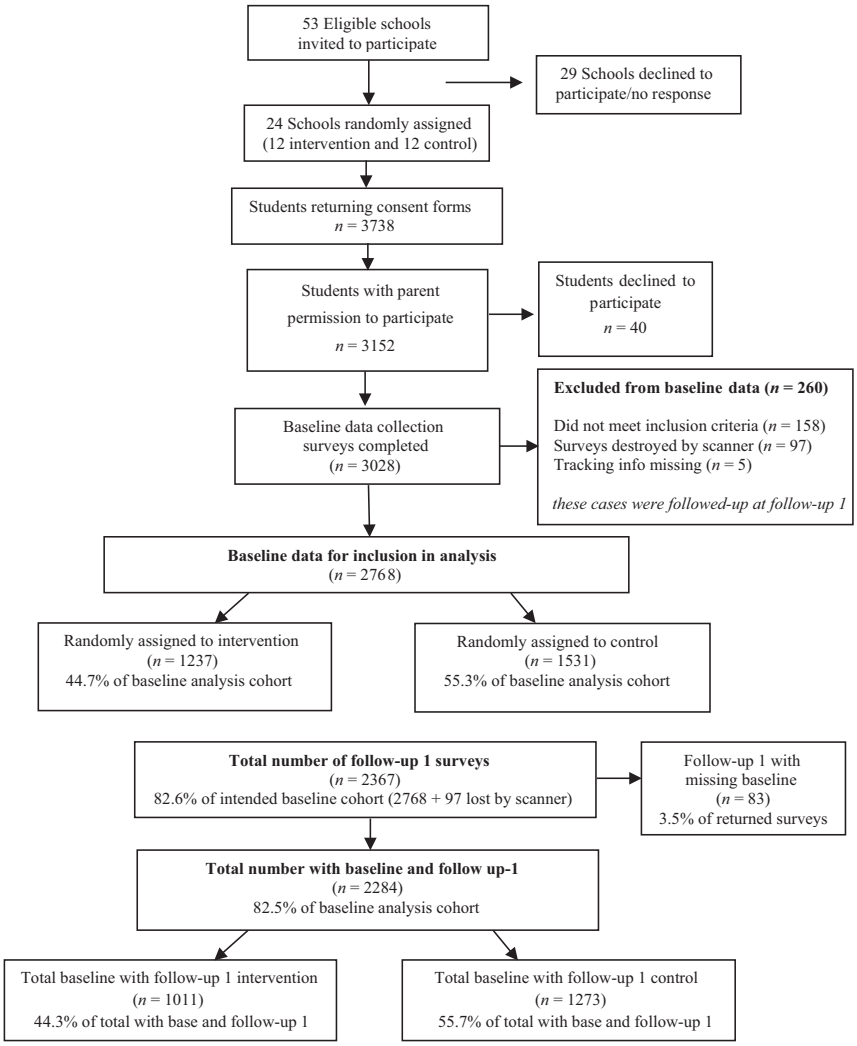

FIGURE 1
Consort flow diagram.

enrollment, race and ethnicity, and number of economically disadvantaged students and randomly assigned to the intervention ($n = 12$; 1237 participants) or the control ($n = 12$; 1531 participants) group. The study statistician conducted the school level randomization and was blinded to identifying information. At baseline, participants (50% female) self-reported their ethnicity as Hispanic or Latinx (35%), Black (24%), Asian American (17%), white (8%), and multiethnicity or other (16%). The primary study outcome was analyzed on a subsample of those participants who reported a boyfriend or girlfriend in the last 12 months (44.6% of the sample; $n = 1019$). Students in intervention schools received *Fourth R* even if they did not participate in the study. Teachers in the intervention schools were trained by the study team to deliver *Fourth R* before classroom implementation. Unlike in Wolfe et al,[17] the curriculum was delivered in mixed-sex groups.

Intervention

The *Fourth R* is an evidence-based approach to promoting healthy youth relationships and preventing violence through an intensive classroom-based curriculum.[17] The intervention was designed to present factual information in an interesting and engaging format, enhance youth motivation, and teach skills that promote healthy relationships and reduce conflict, risk behaviors, and substance misuse. The program was adapted from the original ninth-grade Canadian version by being more developmentally appropriate for a younger age, tailored to an American audience (eg, references to hockey changed to football, new videos with US adolescents), and included lessons on mental health and well-being. The curriculum, which is delivered by existing teachers is composed of 3 units, including 7 classes on personal safety and injury prevention; 8 classes on substance use, addiction, and

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related behaviors; and 7 classes on growth and development (See Fig 2 for an overview). Teacher training incorporated strategies to increase fidelity; implementing teachers were asked to complete curriculum fidelity logs and teacher surveys; and research staff conducted lesson observations and followed-up with teachers to assist them as needed to maintain a high level of fidelity.

Objectives and Outcome Measures

The primary aim with the larger study is to determine if *Fourth R* implemented in seventh grade evidences reductions in ARA and other problematic behaviors when measured 3 years later (when adolescents are in 10th grade). For the current study, we examined the short-term (1-year) impact of *Fourth R* on physical ARA perpetration, substance use, peer fighting, and bullying.

Perpetration of physical ARA (baseline and 1-year follow-up) was assessed with 4 items from the *Conflict in Adolescent Dating Relationships Inventory*.[18] Items were preceded by specific questions about adolescents' dating histories (eg, whether they have dated, number of dating partners, length of relationship); adolescents were instructed to mark who they will be thinking of when answering these questions. Participants indicated whether (yes or no) each act happened during a conflict or argument with their dating partner (or former dating partner) during the past 12 months (eg, "I pushed, shoved, or shook my partner"). The *Conflict in Adolescent Dating Relationships Inventory* has been shown to have strong reliability and validity and to be sensitive for measuring changes in abusive behavior over time.[18] For substance use, participants were asked (yes or no) about lifetime (baseline) and past-year (1-year follow-up) use of alcohol (more than just a few sips) and marijuana. We assessed past-year bullying perpetration with a modified version of the revised Olweus Bullying

Unit 1: Personal Safety and Injury Prevention

1. Healthy Relationships (qualities of a good friend)
2. Impact of Bullying and Harassment (understanding the bully, being bullied, and the bystander)
3. Benefits and Dangers of Technology (safe and responsible use of technology)
4. Stress and Emotional Regulation (identifying stressors and coping activities)
5. Decision -making (IDEAL decision-making model)
6. Skills into Practice (identifying passive, aggressive, and assertive communication)
7. Practicing Skills and Culminating Activity (delay, refusal, negotiation skills, and assertive communication practice)

Unit 2: Substance Use, Addictions, and Related Behaviors

1. Problematic Substance Use (internal and external factors of substance use)
2. Linking Substance Use with Mental Health (discussion about connection between mental health and substance use)
3. Connection Between Body Image and Substance Abuse (short-term and long-term effects of common substance use)
4. Help-Seeking Practice (help-seeking and listening and supporting skills)
5. Researching the Implications of Substance Use and Addictions (impact on family and friends, legal, health, and safety)
6. Implications of Substance Use and Addictions Presentations (understanding impact of substance use and addictions)
7. Practicing Skills Related to Substance Use and Other Addictions (delay, refusal, and negotiation skills)
8. Practicing Skills and Culminating Activity (role-play exercises)

Unit 3: Human Development and Sexual Health

1. Knowing Yourself (values, goals, and other factors that influence decisions)
2. STI/STDs Research (symptoms and prevention)
3. Preventing STI/STDs (student presentations on STI/STDs)
4. Factors Related to Sexual Health Decisions (scenarios and discussion)
5. Consent (what is consent and when consent is and is not being communicated)
6. Communication (communication with your partner, delay, refusal, and negotiation skills)
7. Culminating Activity (written assessment)

Note. Each of the 3 units includes 7–8 lessons (45 minutes per lesson). Examples of content are in parentheses.

FIGURE 2
Grade 7 curriculum overview and examples from *Fourth R*: Skills for Youth Relationships. IDEAL, Identify the problem, Describe how you might solve the problem, Evaluate all possible solutions, Act on one of the solutions, Learn from your choices; STD, sexually transmitted disease; STI, sexually transmitted infection.

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Questionnaire,[19] in which youth responded to 8 items (eg, "left someone out of things, excluded, or ignored them") on a 5-point scale anchored by 1 (never) and 5 (often). Cronbach's α for the current study was 0.85. Finally, participants were asked if they had been in a physical fight in the past year (yes or no).[20]

Procedures

Before participating in the baseline survey (winter 2018), students received information about the study and how their confidentiality will be protected. Baseline surveys were completed by paper and pencil in schools during regular class time. Students received a $5 gift card for completing the baseline survey. As shown on the consort diagram, response rate was 74%.

The 1-year postintervention follow-up data were collected during spring 2019. A majority of students completed the paper and pencil 1-year follow-up survey in school during regular class time; students unable to be surveyed at their school completed the survey via the Web (n = 103). Students received a $10 gift card for completing the 1-year follow-up. The study was approved by the first author's institutional review board.

Statistical Methods

Multilevel logistic and linear regression analyses assessed intervention effectiveness on physical ARA perpetration, substance misuse, bullying, and fighting. A regression approach allowed for the inclusion of covariates including sex, race and ethnicity, and parental education, as well as the baseline value for each outcome to ensure a balanced assessment of intervention impact. All models adjusted for sex, race and ethnicity, school district, and the baseline measure of the dependent outcome. Individual measures of family structure, parental education, and school level measures of bully perpetration and substance use were screened by using the following criteria: (1) baseline difference at the individual level with significance of $P <$ .10; and (2) significantly associated the dependent measure at $P <$ .05. This screening was repeated for the overall sample, dating subsample, and all subgroups. Multilevel models adjusted for intraclass correlation (ICC) present among students sampled from the same school. Estimates from these models were adjusted for the nonindependence of observations that may arise from clustered sampling designs and provided corrected SE estimates, thus avoiding the risk of inflated type I error rates. Each outcome was modeled separately, with the primary focus placed on the estimation of intervention impact. The treatment effect represented the impact of the intervention relative to the control (treatment = 1, control = 0). For logistic models, proportions were reported along with odds ratios (ORs) and 95% confidence intervals (CIs) to estimate effect size. For the linear model, the mean, SD, and β coefficient from the adjusted model are reported. The β represents the difference in the adjusted means between the intervention and control condition. Attrition analyses were conducted to identify the profile of students retained in the study as well as to identify any differential attrition patterns between conditions. Students with missing data on baseline scores were omitted from the fitted models. The analysis was performed by using Stata statistical software (Stata/IC 15.1; Stata Corp, College Station, TX).

RESULTS

At baseline, 2768 students completed surveys, and at 12 months postintervention (18 months postbaseline), 2284 completed their 1-year follow-up, representing a retention of 82.5%. Attrition was higher for Hispanic- and Black-identified students and lower for Asian American–identified students. Attrition was lower for students with college-educated parents and students 12 or younger at baseline and higher for students age 14 or older at baseline. Examining differences between intervention and control group revealed that more girls were lost in the intervention group compared with the control group. Fewer Hispanic

TABLE 1 Baseline Characteristics of Study Schools

Characteristic	Control Group	Intervention Group
Total No. (%)	12 (50)	12 (50)
Total student enrollment, min–max	434–1812	487–1429
Total student enrollment, mean (SD)	1052 (405)	1069 (280)
Schools with >500 students, No./total	11/12	11/12
Seventh-grade student enrollment, min–max	143–650	78–483
Seventh-grade student enrollment, mean (SD)	363 (148)	344 (122)
Schools with small (versus large) territory, No./total[a]	7/12	6/12
% Economically disadvantaged, min–max	22–98	9–93
Schools with >50% economically disadvantaged, No./total	7/12	8/12

Adapted from Texas Education Agency. 2017-18 Texas academic performance report. Available at: https://rptsvr1.tea.texas.gov/perfreport/tapr/2018/srch.html?srch=C.
[a] All schools were classified as urban.

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students and more Black students were lost to attrition in the intervention group as compared with the control group. More students 12 and younger were lost to attrition in the intervention group. No other differences in attrition were found. As shown on Table 1, schools in both conditions had, on average, >1000 students, and both intervention and control groups had a slight majority of schools with 50% or more of the student population economically disadvantaged.

As shown in Table 2, no differences emerged in the full sample between the intervention and control group with respect to past-year physical fighting (control = 26.8% versus intervention = 29.0%) or sexual experiences (control = 5.5% versus intervention = 5.0%). Higher substance misuse (control = 13.7% versus intervention = 9.9%, P = .006) and bullying (control = 1.28 versus intervention = 1.23, P = .01) were reported in control schools for the full sample. For the subsample of those with a boyfriend or girlfriend in the last 12 months, there was no significant differences between conditions in baseline past-year physical ARA perpetration (control = 17.4% versus intervention = 16.4%) or sexual experiences (control = 9.2% versus intervention = 10.5%).

Intervention Impact on Physical ARA

As shown in Table 3, follow-up surveys revealed that students in the intervention schools were less likely to report perpetrating physical ARA (intervention = 14.9% versus control = 18.3%) relative to students in the control schools (adjusted OR, 0.66; 95% CI, 0.43–1.00; P = .05).

Effect on Secondary Outcomes

As shown in Table 4, no significant differences were detected between control and intervention groups with respect to substance misuse (16.5% vs 12.3%; adjusted OR, 0.88; 95% CI, 0.60–1.28), getting into a fight (23.3% vs 23.6%; adjusted OR, 1.08; 95% CI 0.84–1.39), and bullying (1.21 vs 1.23).

Comment

In this first rigorous evaluation of the middle school version of *Fourth R* for US schools, we found that students

TABLE 2 Baseline Sample Characteristics

	Full Sample (n = 2284)		Subsample BF/GF Last 12 Months (n = 1019)	
	Control Group	Intervention Group	Control Group	Intervention Group
	1273 (55.7)	1011 (44.3)	606 (59.5)	413 (40.5)
Female, No (%)[a]	627 (49.3)	517 (51.1)	294 (48.5)	210 (50.8)
Race and ethnicity, No. (%)				
Hispanic	496 (39.0)	313 (31.0)	267 (44.1)	162 (39.2)
Non-Hispanic white	114 (9.0)	58 (5.7)	42 (6.9)	13 (3.1)
Non- Hispanic Black	296 (23.3)	255 (25.2)	164 (27.1)	142 (44.4)
Asian American	153 (12.0)	224 (22.2)	34 (5.6)	34 (8.2)
Multiple	64 (5.0)	53 (5.2)	27 (4.5)	24 (5.8)
Other[b]	150 (11.8)	108 (10.7)	72 (11.9)	38 (9.2)
Living situation, No. (%)				
Live with both parents	799 (63.8)	668 (68.1)	323 (54.3)	207 (51.9)
1 parent and 1 stepparent	145 (11.6)	103 (10.5)	92 (15.5)	60 (15.0)
Mother only or father only	256 (20.4)	172 (17.5)	148 (24.9)	108 (27.1)
Other[c]	52 (4.2)	38 (3.8)	32 (5.4)	24 (6.0)
Parent education, No. (%)[d]				
Did not graduate from high school	134 (10.7)	44 (6.4)	73 (12.1)	37 (9.1)
Finished high school or GED	121 (9.6)	77 (7.7)	70 (11.6)	44 (10.9)
Some college or training	117 (9.3)	82 (8.2)	63 (10.4)	45 (11.1)
College graduate	564 (44.7)	507 (50.9)	227 (37.6)	159 (39.3)
Do not know[e]	331 (26.2)	266 (26.7)	170 (28.2)	120 (29.6)
Sexually experienced	65 (5.5)	46 (5.0)	52 (9.2)	40 (10.5)
Risk behaviors, No. (%)				
Physical ARA perpetration[f]	—	—	102 (17.4)	64 (16.4)
Physical fight, last year	319 (26.8)	272 (29.0)	—	—
Alcohol and/or marijuana use	167 (13.7)	94 (9.9)	—	—
Bullying perpetration, mean (SD)	1.28 (0.46)	1.23 (0.41)	—	—

—, not applicable.

[a] All percentages are among those providing a valid response.

[b] Other includes those endorsing American Indian, other, and unknown.

[c] Other includes those endorsing grandparents and other.

[d] Highest education level of mother or father.

[e] Do not know includes student who endorsed they did not know the education level of mother or father.

[f] Physical ARA perpetration was analyzed on students reporting a boyfriend or girlfriend in the last 12 mo at follow-up 1 (control n = 606, treatment n = 413, 44.6% of sample). Nondating students were not asked these questions.

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TABLE 3 Primary Outcome Physical Dating Violence Perpetration

	Students with PDV, No./Total No. (%)[a]				
	Control Condition	Intervention Condition	OR[b,c] (95% CI)	*P*	ICC
All students	103/564 (18.3)	58/389 (14.9)			
Unadjusted	—	—	0.77 (0.40–1.48)	.43	0.109
Adjusted	—	—	0.66 (0.43–1.00)	.05	0.006
Sex subgroup					
Male	41/283 (14.5)	21/187 (11.2)			
Unadjusted	—	—	0.71 (0.33–1.50)	.37	0.083
Adjusted	—	—	0.70 (0.37–1.32)	.27	0.000
Female	62/281 (22.1)	36/201 (17.9)			
Unadjusted	—	—	0.77 (0.39–1.53)	.46	0.085
Adjusted	—	—	0.62 (0.35–1.10)	.11	0.010
Race and ethnicity subgroup					
Hispanic	36/246 (14.6)	15/153 (9.8)	—	—	—
Unadjusted	—	—	0.63 (0.32–1.25)	.18	0.002
Adjusted	—	—	0.51 (0.24–1.07)	.07	0.000
Non-Hispanic Black	50/156 (32.1)	28/129 (21.7)			
Unadjusted	—	—	0.66 (0.31–1.44)	.30	0.087
Adjusted	—	—	0.56 (0.29–1.08)	.08	0.013

PDV, physical dating violence perpetration; —, not applicable.
[a]66 Students did not provide a valid response to PDV.
[b]OR of intervention effect from multilevel model.
[c]OR adjusted for baseline behavior, race and ethnicity, sex, parental education, and school district.

who received the intervention were less likely to report perpetrating physical ARA over 12 months, relative to students in the control schools. Given the burden of ARA on communities in adolescence and across the life span, these findings indicate a potentially significant public health benefit of this prevention curriculum. This result suggests that teaching students about, and providing skills to engage in, healthy relationships can prevent adolescents from using physical violence against their dating partners. Finding significant behavioral differences between students in the intervention and control schools after only 1 year is noteworthy, especially considering that youth in this age group generally have not or have just began dating.

Notably, ~17% of seventh-graders at baseline reported perpetrating ARA, suggesting that primary prevention programs targeting this behavior may need to begin even earlier in the developmental time frame for certain subgroups.[13,16,21] The timing of interventions to reduce violence and risky behavior requires careful balance in that many young people have not begun dating by seventh grade, yet nearly 1 in 5 students in this study had already perpetrated physical ARA. Specialized programs that address youth at risk for ARA perpetration, including those who have been exposed to violence and higher level of adverse childhood experiences,[22] may help address early onset ARA in sixth grade, when students are typically between ages of 11 and 13. The benefits of *Fourth R* for seventh-graders are supported by previous evaluations, which have established the intervention cost-effectiveness[23] and efficacy with high-risk and trauma-exposed adolescents.[24] Teachers give overwhelmingly positive reviews for *Fourth R* and maintain program fidelity,[25] indicating that it is a readily adaptable prevention curriculum that provides benefits beyond the health curriculum as usual. Notably, most of this formative research has been conducted with Canadian youth and should be replicated in other regions.

Because *Fourth R* targets the shared risk and protective factors of multiple problem behaviors, we also evaluated the intervention's secondary effects on bullying, peer-directed fighting, and substance misuse (alcohol and marijuana). Contrary to expectations,

TABLE 4 Secondary Outcomes: Alcohol and Marijuana Use, Physical Fight, Bully Perpetration

	Control Condition	Intervention Condition	OR or β (95% CI)	*P*	ICC
Logistic models, No./total No. (%)					
Alcohol/marijuana use	204/1233 (16.5)	122/988 (12.3)	0.88[a] (0.60 to 1.28)	.50	0.027
Fight in the last year	283/1215 (23.3)	227/961 (23.6)	1.08 (0.84 to1.39)	.53	0.000
Linear model, mean (SD)					
Bully perpetration[c]	1.21 (0.45)	1.23 (0.46)	0.03[b] (−0.02 to 0.07)	.213	0.001

[a]OR of intervention effect from multilevel logistic adjusted for baseline behavior, race and ethnicity, sex, parental education, and school district.
[b]Intervention effect from multilevel linear model adjusted for baseline behavior, race and ethnicity, sex, parental education, and school district; β represents the difference in the adjusted means between intervention and control on the bully perpetration scale.
[c]Bully perpetration measured on a scale from 1 to 5, where higher on the scale indicates increased perpetration.

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no significant differences between the intervention and control groups emerged for these variables. It is possible that, because relatively few adolescents have started using substances, the skills learned in the intervention have not had time to materialize. Indeed, past-year alcohol and marijuana use rates at baseline were 13.7% and 9.9% for the control and intervention group, respectively, and were 16.5% and 12.3% in the 1-year follow-up, resulting in small percentage increases of <3% for both groups. Indeed, mounting evidence indicates that the prevalence of risky behaviors (eg, substance use, sexual debut) rapidly increases in the eighth grade and then spikes in the transition to high school.[26] Thus, a longer follow-up period is needed to fully understand program impact on substance misuse and other risky behaviors. Indeed, follow-up surveys and analyses are currently underway. With respect to bullying and fighting, it is possible that these behaviors developed and became ingrained before the intervention.[27] School climate is a prime driver of peer violence and bullying,[28,29] indicating that interventions may benefit from increased attention to the broader school community. Furthermore, the control condition was not "no treatment" because students received the standard health curriculum, which by state guidance must include information on substance misuse, mental health, and relationships. Regardless, given the variability in outcomes and depending on long-term findings, schools may benefit from a multiyear program in which peer relationships are emphasized in sixth grade, dating relationships in seventh grade, and substance misuse in eighth grade.

Limitations

Our findings should be interpreted in light of several limitations. First, like all self-report studies, participants may under- (eg, social desirability) or over- (eg, "faking bad") report on problem behaviors. However, we made substantial efforts to encourage honest reporting, including communicating the confidential nature of the study to the students. Furthermore, our use of a multi-item questionnaire overcomes the limitation of many previous studies in which researchers rely on a single-item assessment of physical ARA; however, future researchers should examine the effectiveness of the intervention on other forms of ARA. Second, as with all primary prevention interventions, 1 year may not be enough time to determine program effectiveness (ie, behaviors may not have had time to materialize). Third, although a major strength of the current sample is the racial, ethnic, cultural, and economic diversity, the regional and urban sample may, respectively, limit generalizability to other areas and rural schools. Finally, future research will benefit from considering the role of factors at the outer levels of social influence like parents and neighborhoods.

CONCLUSION

The *Fourth R*, adapted for a seventh-grade, ethnically diverse audience of early adolescents in Texas, was effective in reducing physical ARA perpetration over at least 1 year. In the short-term, the intervention did not have an effect on bullying perpetration, physical fighting with peers, and substance misuse. Long-term assessment, especially a follow-up that covers the transition to high school, is needed to see the program benefit on key outcomes, as well as to test the role of mental health, previous life and family experiences, attitudes, knowledge, and skills on program efficacy. Addressing the urgent concern of ARA and its consequences is a major challenge for schools and communities. The *Fourth R* appears to be an effective tool in preventing this form of violence.

ABBREVIATIONS

ARA: adolescent relationship abuse
CI: confidence interval
ICC: intraclass correlation
OR: odds ratio
RCT: randomized controlled trial

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