IP Online First, published on August 16, 2013 as 10.1136/injuryprev-2013-040815

Evaluation of a school-based violence prevention media literacy curriculum

Kathryn R Fingar,[1] Tessa Jolls[2,3]

[1]Southern California Injury Prevention Research Center, University of California Los Angeles, California, USA
[2]Center for Media Literacy, Santa Monica, California, USA
[3]Consortium for Media Literacy, Malibu, California, USA

Correspondence to
Dr Kathryn Fingar c/o Consortium for Media Literacy 22837 Pacific Coast Highway #472, Malibu, CA 90265, USA; krmartin@ucla.edu

Received 12 March 2013
Revised 10 June 2013
Accepted 23 July 2013

ABSTRACT

Purpose Evaluate whether *Beyond Blame*, a violence prevention media literacy curriculum, is associated with improved knowledge, beliefs and behaviours related to media use and aggression.

Methods Using a quasi-experimental design, from 2007 to 2008, teachers from schools across Southern California administered the curriculum with or without training or served as controls. Students were tested before and after the curriculum was implemented, and during the fall semester of the next academic year. Multivariate hierarchical regression was used to compare changes from baseline to follow-up between the intervention and control groups.

Results Compared with controls, at the first post-test, students in the trained and untrained groups reported increased knowledge of five core concepts/key questions of media literacy, increased self-rated exposure to media violence, as well as stronger beliefs that media violence affects viewers and that people can protect themselves by watching less. Regarding behaviours, controls were more likely to report ≥8 h of media consumption at the second post-test than at baseline (OR=2.11; 95% CI 1.13 to 3.97), pushing or shoving another student (OR=2.16; 95% CI 1.16 to 4.02) and threatening to hit or hurt someone (OR=2.32; 95% CI 1.13 to 4.78). In comparison, there was no increase in these behaviours in the trained and untrained groups.

Conclusions This study suggests media literacy can be feasibly integrated into schools as an approach to improving critical analysis of media, media consumption and aggression. Changing the way youth engage media may impact many aspects of health, and an important next step will be to apply this framework to other topics.

INTRODUCTION

In many ways, adolescents today are media-savvy. On average, youth ages 8 through 18 spend nearly 8 h—one-third of their day—engaged with media. Because they often interact with multiple mediums at once (ie, watching TV while surfing the internet), adolescents may actually consume closer to 11 h of content daily.[1] More so than most parents, kids are adept in navigating television, gaming consoles, computers, as well as mobile devices, which allow access throughout the day from nearly any location, including school. An estimated 66% of youth have a personal cell phone and 58% use their phone in class on a daily basis.[1 2] At home, 71% have a television, 33% have a computer with the internet and 50% have video games in their own room, with little parental regulation—less than half (46%) have rules about what they can watch and only 28% have rules about how much they can watch.[1]

Although adolescents are clearly skilful in navigating technology and have ample opportunity to do so, there is little evidence to suggest they can critically evaluate the material with which they come in contact, which is saturated with images promoting cigarettes, fast food, sex and violence. Although the problems youth face today are undoubtedly complex, research suggests media contribute, in part, to a variety of adverse outcomes,[3–5] including poor sleep,[6] low academic achievement,[7] attention deficit disorder,[8] depression,[9] substance use,[10 11] asthma,[12] obesity,[13] eating disorders,[14] sexual risk behaviours[15] and aggression.[16 17] Youth clearly benefit from opportunities for self-expression, socialisation and education offered by modern media. But to fully appreciate these benefits, they must be able to protect themselves from potentially harmful exposures.

Media literacy is a promising approach to mitigating negative effects of media use because it does not rely solely on society or parents to regulate content or quantity. Media literacy entails the ability to analyse and evaluate how media messages influence one's own beliefs and behaviours.[18 19] In this process, the viewer is not a passive recipient, but an active participant who can be more critical of negative content. Greater media literacy may prompt youth to protect themselves by changing the types of media they use or by reducing total consumption. However, the greater focus is not on regulation, but on teaching young people critical thinking skills that will allow them to interact with media in a healthier way, that they can become productive citizens in an increasingly global and technology-driven society.[20 21]

Media literacy is recognised as a 21st century approach to education and violence prevention,[22–25] but its incorporation into educational settings is uncommon. A recent review found only 28 evaluations of media literacy curricula over the past two decades, which addressed a number of health issues, used different pedagogical approaches and ranged in effectiveness.[26] Although several studies linked media literacy to decreased aggression,[27–31] few were implemented by teachers in middle schools[32–34] and few examined media use.[31 32] School-based interventions at this age are important because curricula administered by researchers are often not successful when translated to real-world conditions. Adolescence is also an important developmental period during which youth begin to relate to the world outside their home and families, establishing patterns of behaviour and interaction with both media and peers. The existing literature has not paid close attention to changes in media use, which may not only impact aggression but also a variety of other health

To cite: Fingar KR, Jolls T. *Inj Prev* Published Online First: [*please include* Day Month Year] doi:10.1136/injuryprev-2013-040815

outcomes.[4] It is largely unknown if media literacy prompts youth to use less media, to substitute one medium for another with less problematic material or to more thoughtfully engage, even if few changes are made to content or quantity.

The purpose of this study is to evaluate whether a media literacy curriculum focused on violence prevention among students in the 6th through 8th grades is associated with (1) improved knowledge of media literacy, (2) healthier beliefs about violent media, (3) changes in use of specific mediums, including television, video games, the internet, music and print materials, (4) decreased total consumption and (5) decreased aggression.

METHODS

Study design

During the 2007–2008 academic year, researchers from the Southern California Injury Prevention Research Center at the University of California, Los Angeles conducted a quasi-experiment to assess the effectiveness of *Beyond Blame: Challenging Violence in the Media*—developed by the Center for Media Literacy (CML) and administered by teachers from public mainstream and charter middle schools throughout Southern California. First researchers obtained administrative support from the district and then used social and professional networks to recruit school administrators and teachers. Health, social studies and language arts teachers were eligible to participate and were also recruited by posting flyers at the school. Teachers participated in one of three intervention groups: trained, untrained or control. All teachers within a school were assigned to the same group to avoid bias from cross-contamination. Trained and untrained teachers completed the curriculum within one semester and students were tested directly before and after. Controls were tested at the beginning and end of the semester. To assess longer-term effects, a subset of teachers was randomly selected so the comparison groups were similar with respect to race/ethnicity and grade and invited to participate in a follow-up assessment during the fall semester of the next academic year. Before the onset of the study, parental consent forms were distributed in English and Spanish and students received and signed assent forms. Additional information can be found in a prior publication.[35]

Intervention

Beyond Blame was designed to meet California English-Language Arts and Health Education standards, as well as National Education Technology standards for middle schools.

The curriculum is based on five core concepts developed by the CML,[25] each of which is accompanied by a key question (table 1).

Made up of 10 lessons lasting 45–50 min each, *Beyond Blame* builds upon a four-step learning process of awareness, analysis, reflection and action.[36] In this process, students are taught to deconstruct media messages that convey violence has no consequences and is an acceptable way to resolve conflict. Using the core concepts/key questions (CC/KQ), kids learn to question a message's purpose rather than accepting the value systems promoted by media at face value. Because media literacy is still a new discipline, training may be important. Therefore, teachers assigned to the trained group attended a one-day workshop. Because a stand-alone curriculum that teachers could implement without training would allow greater use, an untrained group was recruited.

Table 1 Beyond Blame's lessons and core concepts/key questions (CC/KQ) of media literacy

Lesson	Title and introduction of CC/KQ
1	What is media?
2	What is violence?
3	Media and violence: effects on society *Aggression, fear for one's own safety, desensitisation to the pain and suffering of others, habituation*
4	Tools for media literacy: CC/KQ #1 *All media messages are constructed* *Who created this message?*
5	Tools for media literacy: CC/KQ #2 *Media messages are constructed using a creative language with its own rules* *What creative techniques are used to attract my attention?*
6	Tools for media literacy: CC/KQ #3 *Different people experience the same media message differently* *How might different people understand this message differently?*
7	Tools for media literacy: CC/KQ #4 *Media have embedded values, lifestyles and points of view* *What values, lifestyles and points of view are represented in or omitted from this message?*
8	Tools for media literacy: CC/KQ #5 *Most media messages are constructed to gain profit and/or power* *Why is this message being sent?*
9	Using the key questions: Practice! Practice! *Students analyse a media clip and examine their own levels of media consumption*
10	Activate, disseminate, participate! *In the last lesson, students construct their own media messages.*

Measurement

Knowledge

The first outcome was knowledge of the CC/KQ. Students were asked, on a five-point scale, whether people react to media violence differently; whether media is based on a desire for influence, profit and power; and asked to identify the CC/KQ in a list of correct and incorrect options. A point was given for each option checked (or not checked) correctly. The questions, worth five points each, were averaged to create a continuous score where five represents greater knowledge.

Beliefs

Second, beliefs about media violence were assessed. Awareness was measured by asking students to rate how much media violence they see (from one to five, examined as a continuous outcome); whether people can protect themselves by watching less (true vs false/not sure, dichotomous outcome); whether media violence is a problem (yes vs no, dichotomous outcome); and how much they agree on a five-point scale that media violence affects aggression, fear for one's safety, desensitisation to pain and suffering of others and wanting to watch more violence (averaged to create a continuous score where five represents a stronger belief that media violence affects viewers).

Behaviours

Students were asked how many hours they spend during an average school day/night (1) watching television, (2) playing video games, (3) on the internet, (4) listening to music and (5) reading magazines/newspapers. Responses were summed to calculate total consumption and dichotomised (<8 vs 8+, chosen because it is the national average[1]). If one item used to calculate any summary score described above was missing, the

summary score was also set to missing and excluded. For each composite score, <4% of responses were missing.

Finally, aggression was measured using the Aggression Scale from Centers for Disease Control's (CDC) *Compendium of Assessment Tools*.[37] Students were asked about the frequency of 11 aggressive behaviours in the past week: got angry very easily with someone; was angry most of the day; teased students to make them angry, said things about other kids to make other students laugh; called other students bad names; encouraged other students to fight; fought back when someone hit them first; got into a physical fight because they were angry; slapped or kicked someone; pushed or shoved other students; threatened to hurt or hit someone. Responses from zero to 6+ were summed to create a continuous score, where 66 represent more aggressive behaviours. Each item was also dichotomised (zero vs 1+) and examined separately.

Analysis

Changes from baseline to follow-up were compared among all students in the trained, untrained and control groups, and then examined among the subset who participated in the second post-test. Because data were collected in naturalistic clustered settings, hierarchical linear/logistic models were used to assess the association between the intervention and continuous/categorical outcomes. Models included a random effect for classroom to adjust for clustering of student responses within teachers, as well as fixed effects for student characteristics, including race/ethnicity, grade level and gender, to control for confounding. The models also included parameters for each intervention group (trained/untrained vs control), time (first/second post-test vs baseline) and the interaction between intervention group and time. In linear regression, the parameter for the interaction term is directly interpreted as the difference in the magnitude of change from baseline to the first/second post-test between the intervention and control group. In logistic regression, an OR was calculated comparing the probability of the outcome at the first/second post-test with baseline, within each intervention group. In both cases, the p value for the interaction term tests whether change over time in the intervention group was statistically different from change among controls. Analyses were conducted in SAS V.9.2 (Cary, North Carolina, USA). Information on sample size determination can be found elsewhere.[35]

RESULTS

This analysis includes 1580 students who completed the first post-test, 426 of whom completed the second post-test (figure 1). The number who completed the first post-test excludes 113 students from one control school that administered another violence prevention programme after completing *Beyond Blame*, between the first and second post-test.

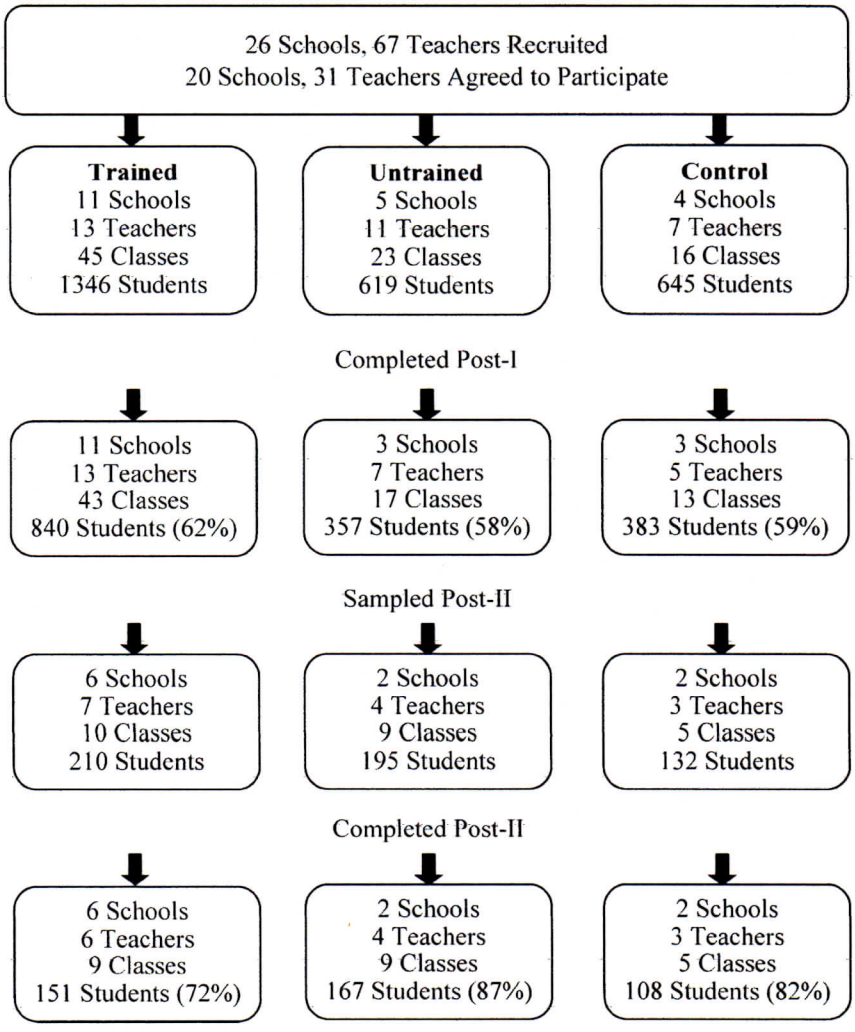

Figure 1 Overview of study design and follow-up.

Table 2 Characteristics of students who completed the first (n=1580) and second (n=426) post-test

	Post-I, N (%)							Post-II, N (%)						
	Trained (N=840)		Untrained (N=357)		Control (N=383)		p Value	Trained (N=151)		Untrained (N=167)		Control (N=108)		p Value
Gender														
Female	426	(51.0)	178	(50.0)	200	(52.5)	0.79	79	(52.7)	82	(49.1)	55	(51.4)	0.81
Male	410	(49.0)	178	(50.0)	181	(47.5)		71	(47.3)	85	(50.9)	52	(48.6)	
Race/ethnicity														
Black	24	(2.9)	10	(2.8)	81	(21.4)	<0.01	5	(3.3)	6	(3.6)	2	(1.9)	<0.01
Asian	135	(16.2)	22	(6.3)	104	(27.5)		16	(10.7)	13	(7.8)	33	(30.8)	
Hispanic	577	(69.2)	224	(63.6)	169	(44.7)		107	(71.3)	99	(59.6)	65	(60.8)	
Other	25	(3.0)	8	(2.3)	13	(3.4)		7	(4.7)	5	(3.0)	0	(0.0)	
White	73	(8.8)	88	(25.0)	11	(2.9)		15	(10.0)	43	(25.9)	7	(6.5)	
Grade level														
6th	209	(24.9)	57	(16.0)	64	(16.8)	<0.01	51	(33.8)	24	(14.4)	0	(0.0)	<0.01
7th	492	(58.7)	299	(84.0)	301	(78.8)		100	(66.2)	143	(85.6)	108	(100)	
8th	137	(16.4)	0	(0.0)	17	(4.5)		0	(0.0)	0	(0.0)	0	(0.0)	

Notes: p value from χ^2 test for difference between intervention groups.

The intervention groups differed on race/ethnicity and grade (table 2)—the trained and untrained groups were more likely to be Hispanic than controls (69.2% and 63.6% vs 44.7%, respectively); controls were more likely than the trained and untrained groups to be Black (21.4% vs 2.9% and 2.8%) and Asian (27.5% vs 16.2% and 6.3%). The trained group also had a higher proportion of 6th and 8th graders.

Changes in knowledge

After controlling for gender, grade and race/ethnicity, from baseline to the first post-test, increases in knowledge of the CC/KQ in the trained and untrained groups were 0.33 and 0.15 points greater, respectively, than the change among controls (p<0.01; p=0.02; table 3). At the second post-test, the trained group demonstrated improved knowledge of the CC/KQ, although it was not statistically different from controls (p=0.20). No association was observed at the second post-test in the untrained group (p=0.79).

Changes in beliefs

Compared with controls, the trained (p=0.09) and untrained (p=0.0498) groups reported seeing more media violence at the first post-test than at baseline, which is likely due to greater awareness versus increased consumption, and therefore, grouped as a belief (table 4). From baseline to the first post-test, the trained and untrained groups reported stronger beliefs that media violence affects viewers compared with controls (p<0.01); and the trained (OR=1.64; 95% CI 1.33 to 2.03) and untrained (OR=1.38; 95% CI 1.01 to 1.88) groups were more likely to think people can protect themselves by watching less. The p values testing differences between these ORs and controls (OR=0.96; 95% CI 0.71 to 1.30) were p<0.01 and p=0.11, respectively. The trained (OR=1.45; 95% CI 1.17 to 1.79) and untrained (OR=1.18; 95% CI 0.85 to 1.63) groups were also more likely to think media violence is problematic, although neither OR was statistically different (p=0.40, p=0.86, respectively) from controls (OR=1.23; 95% CI 0.89 to 1.70). There was a drop in retention of these beliefs at the second post-test.

Behavioural changes

There was no association between the intervention and use of specific mediums (not shown). Regarding all mediums (table 5), at the second post-test controls were more likely to consume ≥8 h compared with baseline (OR=2.11; 95% CI 1.13 to 3.97), which was statistically different (p=0.02, p=0.04, respectively) from the trained (OR=0.81; 95% CI 0.49 to 1.35) and untrained (OR=0.92; 95% CI 0.56 to 1.52) groups, where there was no increase.

There was no association between the intervention and the scored 11-item aggression scale (not shown). However, from baseline to the second post-test, controls were more likely to

Table 3 Changes in knowledge of the core questions and key concepts (CC/KQ) of media literacy

	Students who completed post-I (N=1580)							Students who completed post-II (N=426)								
	Pre Mean (SD)		Post-I Mean (SD)		Change, pre to post-I			Pre Mean (SD)		Post-I Mean (SD)		Post-II Mean (SD)		Change, pre to post-II		
					β (95% CI)		p Value							β (95% CI)		p Value
Knowledge of CC/KQ																
Trained	3.40	(0.61)	3.79	(0.64)	0.33	(0.23 to 0.43)	<.01	3.24	(0.64)	3.71	(0.64)	3.51	(0.66)	0.14	(−0.07 to 0.36)	0.20
Untrained	3.34	(0.58)	3.56	(0.65)	0.15	(0.03 to 0.27)	0.02	3.35	(0.59)	3.52	(0.66)	3.46	(0.69)	−0.03	(−0.24 to 0.18)	0.79
Control	3.32	(0.66)	3.39	(0.65)				3.39	(0.65)	3.35	(0.66)	3.51	(0.61)			

Notes: Pre to post-I model adjusted for gender, race/ethnicity and grade level; pre to post-II model adjusted for gender and race/ethnicity; both models included a random effect for classroom; β is the difference in change from the pre-test to the first or second post-test between the intervention and control group; p value corresponds to the interaction term testing whether the change in the intervention group was significantly different than the change among controls.

Table 4 Changes in beliefs about media violence

	Students who completed post-I (N=1580)							Students who completed post-II (N=426)									
	Pre		Post-I		Change, pre to post-I			Pre		Post-I		Post-II		Change, pre to post-II			
Self-rated exposure to media violence																	
	Mean (SD)		Mean (SD)		β (95% CI)		p Value	Mean (SD)		Mean (SD)		Mean (SD)		β (95% CI)			p Value
Trained	2.89	(1.37)	3.31	(1.34)	0.21	(−0.03 to 0.45)	0.09	2.91	(1.43)	3.43	(1.33)	3.18	(1.34)	−0.09	(−0.57 to 0.39)		0.70
Untrained	2.80	(1.40)	3.29	(1.38)	0.29	(−0.0002 to 0.6)	0.05*	2.72	(1.40)	3.18	(1.41)	3.24	(1.32)	0.15	(−0.32 to 0.63)		0.52
Control	2.90	(1.38)	3.11	(1.33)				2.93	(1.39)	3.09	(1.34)	3.32	(1.37)				
Media violence affects viewers																	
	Mean (SD)		Mean (SD)		β (95% CI)		p Value	Mean (SD)		Mean (SD)		Mean (SD)		β (95% CI)			p Value
Trained	3.26	(0.56)	3.64	(0.60)	0.33	(0.24 to 0.43)	<.01	3.25	(0.58)	3.65	(0.56)	3.42	(0.57)	0.07	(−0.11 to 0.26)		0.44
Untrained	3.23	(0.51)	3.56	(0.60)	0.28	(0.17 to 0.39)	<.01	3.21	(0.51)	3.54	(0.61)	3.42	(0.51)	0.11	(−0.08 to 0.29)		0.27
Control	3.27	(0.50)	3.32	(0.49)				3.29	(0.52)	3.39	(0.51)	3.39	(0.50)				
Can protect yourself by watching less																	
	N (%)		N (%)		OR (95% CI)		p Value	N (%)		N (%)		N (%)		OR (95% CI)			p Value
Trained	476	(57.3)	560	(67.5)	1.64	(1.33 to 2.03)	<.01	78	(51.7)	100	(66.2)	95	(63.3)	1.68	(1.04 to 2.71)		0.83
Untrained	177	(50.3)	197	(56.6)	1.38	(1.01 to 1.88)	0.11	77	(47.2)	93	(56.4)	87	(53.1)	1.38	(0.87 to 2.18)		0.46
Control	191	(51.2)	193	(51.3)	0.96	(0.71 to 1.30)		48	(45.7)	51	(47.2)	64	(59.3)	1.82	(1.03 to 3.22)		
Media violence is problematic																	
	N (%)		N (%)		OR (95% CI)		p Value	N (%)		N (%)		N (%)		OR (95% CI)			p Value
Trained	453	(58.2)	528	(66.8)	1.45	(1.17 to 1.79)	0.40	89	(62.2)	99	(68.8)	94	(64.4)	1.07	(0.65 to 1.75)		0.45
Untrained	213	(62.8)	218	(65.9)	1.18	(0.85 to 1.63)	0.86	106	(67.1)	102	(63.8)	102	(64.6)	0.93	(0.56 to 1.51)		0.68
Control	217	(62.5)	230	(66.1)	1.23	(0.89 to 1.70)		62	(62.0)	63	(64.3)	59	(55.1)	0.79	(0.44 to 1.42)		

*p=0.0498.

Notes: Pre to post-I model adjusted for gender, race/ethnicity and grade level; pre to post-II model adjusted for gender and race/ethnicity; additionally, all models adjusted for knowledge of the core concepts/key questions of media literacy at baseline and included a random effect for classroom; for the continuous outcomes, β is the difference in change from the pretest to the first or second post-test between the intervention and control group; for the dichotomous outcomes, the OR is the odds of the outcome at the first or second post-test relative to the pre-test within the intervention group; in both cases, the p value corresponds to the interaction term testing whether the change in the intervention group was significantly different from the change among controls.

report pushing or shoving another student (OR=2.16; 95% CI 1.16 to 4.02) and threatening to hit or hurt someone (OR=2.32; 95% CI 1.13 to 4.78); whereas no increases were observed in the intervention groups (table 5). The latter OR was statistically different (p=0.01) from the OR in the untrained group (OR=0.76; 95% CI 0.45 to 1.26).

DISCUSSION

Media literacy is a unique intervention strategy offering young consumers a framework for inquiry and discernment that is both consistent and flexible—youth can apply this framework anywhere, anytime, to any health topic. The goal is to promote healthy choices by increasing children's capacity to critically

Table 5 Behavioural changes in the total number of hours of media consumed daily and in aggression

	Students who completed post-I (N=1580)							Students who completed post-II (N=426)								
	Pre		Post-I		Change, pre to post-I			Pre		Post-I		Post-II		Change, pre to post-II		
	N	(%)	N	(%)	OR	(95% CI)	p Value	N	(%)	N	(%)	N	(%)	OR	(95% CI)	p Value
≥8 h of media consumed daily																
Trained	319	(42.0)	347	(44.2)	1.17	(0.94 to 1.46)	0.46	76	(55.5)	80	(55.9)	72	(50.4)	0.81	(0.49 to 1.35)	0.02
Untrained	162	(50.2)	155	(46.4)	0.83	(0.59 to 1.16)	0.04	80	(54.4)	72	(45.9)	80	(51.6)	0.92	(0.56 to 1.52)	0.04
Control	152	(45.1)	177	(50.7)	1.36	(0.97 to 1.91)		48	(46.6)	59	(56.2)	64	(62.8)	2.11	(1.13 to 3.97)	
Pushed or shoved other students, past week																
Trained	348	(42.1)	415	(50.3)	1.47	(1.18 to 1.82)	0.19	65	(43.1)	80	(53.0)	75	(50.0)	1.35	(0.82 to 2.21)	0.24
Untrained	167	(47.7)	181	(51.9)	1.23	(0.88 to 1.71)	0.73	78	(47.9)	93	(56.4)	82	(50.9)	1.16	(0.72 to 1.89)	0.12
Control	169	(45.1)	184	(49.3)	1.13	(0.82 to 1.56)		53	(50.0)	67	(62.6)	70	(66.0)	2.16	(1.16 to 4.02)	
Threatened to hit or hurt someone, past week																
Trained	178	(21.4)	214	(25.7)	1.34	(1.04 to 1.72)	0.98	33	(21.9)	36	(24.0)	44	(29.1)	1.48	(0.85 to 2.60)	0.34
Untrained	119	(33.8)	112	(32.1)	0.89	(0.62 to 1.27)	0.14	62	(37.8)	58	(34.9)	52	(32.5)	0.76	(0.45 to 1.26)	0.01
Control	71	(18.9)	93	(24.9)	1.33	(0.89 to 1.98)		20	(18.9)	29	(27.1)	32	(30.2)	2.32	(1.13 to 4.78)	

Notes: Pre to post-I model adjusted for gender, race/ethnicity and grade level; pre to post-II model adjusted for gender and race/ethnicity; additionally, all models adjusted for knowledge of the core concepts/key questions of media literacy and beliefs at baseline and included a random effect for classroom; the OR is the odds of the outcome at the first or second post-test relative to the pretest within the intervention group; the p value corresponds to the interaction term testing whether the change in the intervention group was significantly different from the change among controls; 11-item scale asked students to rate the number of times in the past week that they got angry very easily with someone; were angry most of the day; teased students to make them angry, said things about other kids to make other students laugh; called other students bad names; encouraged other students to fight; fought back when someone hit them first; got into a physical fight because they were angry; slapped or kicked someone; pushed or shoved other students; threatened to hurt or hit someone. No differences were found between the intervention and control students on the continuous scale or 9 of the 11 items; therefore, only two items are shown.

navigate the images and sounds they encounter daily through media use. Media are powerful teachers, and children have demonstrated their willingness to learn lessons from media. The challenge lies in providing adolescents tools that will help them understand media systems and the constructed nature of the relationship each consumer enjoys with media. While millions of dollars are spent globally to promote health, or conversely, non-healthy behaviours and products, young consumers are often bereft of the skills needed to interpret media messages and to make healthy personal choices in light of these exposures. It is our responsibility as parents, educators and health professionals to prepare youth for the media-driven culture in which they are immersed, that they may be efficient information managers, wise consumers and active participants.

This study suggests media literacy is a promising approach to school-based violence prevention. Both the trained and untrained interventions were associated with improved knowledge and beliefs. Media use and several aggressive behaviours expected to increase with age were also mitigated when students were retested the next academic year. Although increases in knowledge of the core concepts in the intervention groups were statistically different from controls, they were small in magnitude, and there was a drop in both knowledge and beliefs at the second post-test, indicating the importance of reinforcing lessons over a longer period of time. This can inform decisions about the length of future curricula, which is not well researched, as few media literacy studies have tested students longer than several months after intervention.[26 33] The CC/KQ are also suitable for institutionalisation in educational settings because they provide a framework to address a variety of health topics over time.

The ultimate goal of any intervention is to change behaviours, yet few evaluations have examined consumption. While media literacy curricula are often specific to one health topic, changes in consumption may affect many aspects of health and well-being, creating more time for family, homework and exercise. Although no changes in specific mediums were observed, students in the intervention groups were more likely to limit consumption to <8 h, whereas the percentage of controls that engaged 8+ h increased at the second post-test. Although 8 h seems like a high cut-off, it is consistent with other estimates[1] and over 40% of students reported 8+ h at baseline. The American Academy of Pediatrics recommends that children limit screen time to under 2 h per day[24]; however, only 2.9% (n=12) of all students who completed the second post-test reported limiting consumption to less than 2 h. Therefore, the sample size was not large enough to examine this cut-off point.

There was no association between the intervention and the 11-item aggression scale. Yet two items—pushing/shoving and threats of physical violence—increased among controls, but not in the trained and untrained groups. Although only the latter group showed a statistical difference when compared with controls, the fact that risk behaviours were mitigated when, in fact, they are expected to increase with age is indeed promising. Furthermore, these data are particularly important because they were collected one academic year after the intervention was administered and long-term data are not often collected for media literacy outcomes. Although validated and endorsed by CDC, the scale includes items on feeling angry and verbal provocations (eg, teasing) that *Beyond Blame* may not impact. The social supports for aggression are powerful—not only do kids take cues from media but perhaps even more so, from their families, neighbourhoods and peers. Kids may be angry because of stressors in these environments. A successful intervention may not improve anger, but prevent channelling anger into violence. Furthermore, *Beyond Blame* was designed around the established link between media violence and physical aggression and lessons focused on physical violence. Far less is known about verbal provocations and bullying resulting from media use. Finally, other successful school-based interventions have changed campus environments and been conducted over much longer periods of time,[38] allowing adolescents to go through the stages of change ultimately leading to behaviour modification[39] and this process begins with acknowledging a problem. It is promising that the trained group was more likely to acknowledge media violence is problematic at the first post-test than at baseline.

Unfortunately, we were not able to test whether the associations between the intervention and the outcomes examined at the first post-test were stronger for students at certain grade levels because the sample size within grades was not large enough. This would have lent insight into whether not having 8th graders in the sample at the second post-test affected the follow-up results. More research is needed that examines differences in the effectiveness of media literacy education according to age. There are important developmental milestones occurring even between the 6th and 8th grades that could have impacted the effectiveness of Beyond Blame within our study population.

It is also possible that self-reported consumption of media was inaccurate. The third person effect has been used to explain the tendency of individuals to overestimate the degree to which others are affected by media, yet underestimate the degree to which they themselves are affected.[40] Although the goal of media literacy is to enable consumers to evaluate their relationship with media more realistically, it is possible that the third person effect led to biased reports of how much media violence students see and how many hours they engaged various mediums.

This study is limited because of differences between treatment groups. Although models controlled for race/ethnicity, gender, grade and baseline differences in outcomes, unmeasured differences between groups due to self-selection, motivation and skill sets, could confound the findings. Committing to training or to administering the curriculum or questionnaires may have deterred some teachers from participating, given other demands; some students were lost to follow-up due to missed class. However, participation rates among teachers and students were similar across treatment groups. Because participation depended on district and school approval, it was not feasible to randomise. It is also unlikely randomising a small number of schools would have been effective. The non-randomised nature of this study contributes to existing literature because many curricula have been administered by researchers, rather than teachers, limiting the generalisability of findings.[26]

Despite limitations, and even though the intervention was not associated with every outcome, the results from this study paint a consistent picture—both the trained and untrained groups reported statistically significant improvements in knowledge, beliefs and at least one behaviour examined (media use and/or aggression). For a short intervention, these results are promising and further application and evaluation of media literacy curricula are warranted, particularly those using the theory employed by *Beyond Blame*.

CONCLUSION

Today's global media promote health-related values, practices, products through television, music, film, websites, games and social media that are embedded with values; yet, audiences are

unprepared to filter this information. Media literacy is well-suited to fill this void, but to be an effective health intervention strategy it must be consistent, measurable and replicable. Unfortunately, curricula evaluated to date have not been consistent in their theoretical approach.[26] The results from this study support the CC/KQ as a basis for measurable intervention. An important next step will be to more widely teach and evaluate this framework for learning and living to other health issues, in addition to violence prevention.

What is already known on this subject

- Adolescents have demonstrated their willingness to use and to learn lessons from media, and media's role in the lives of today's youth will only increase.
- Media literacy teaches young people to question values promoted by media, including those supporting aggressive behaviour, offering a promising approach to violence prevention.
- A handful of media literacy interventions have been linked to decreased aggression; yet the body of literature is small, and few curricula have used consistent pedagogy, been taught by teachers instead of researchers or followed students for a significant period of time.

What this study adds

- A curriculum was developed based on a set of core media literacy concepts that are widely used in the USA.
- Students who received the curriculum from a teacher with minimal or no training reported increased knowledge of media literacy and healthier beliefs about media violence, compared with controls, when they were tested directly after the intervention.
- When students were re-tested the next academic year, the curriculum was associated with a reduction in media consumption and aggressive behaviours.

Contributors KRF was responsible for data collection, entry and analysis; interpretation of the results; and preparation of the manuscript and overall content. TJ was involved with developing the curriculum; recruiting teachers and schools to participate in the study; training those assigned to intervention groups; interpreting the results; and writing the manuscript.

Funding This study was supported by the US Centers for Disease Control and Prevention Grant 5R49CE000199-05 and by the Center and Consortium for Media Literacy.

Competing interests None.

Ethics approval University of California, Los Angeles.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement The data from this study reside within the Department of Epidemiology at UCLA. The principal investigator and lead analyst have access to the data.

REFERENCES

1 Rideout VJ, Foehr UG, Roberts DF. *Generation M², media in the lives of 8- to 18-year olds*. Menlo Park, CA: The Henry J. Kaiser Family Foundation, 2010.
2 Lenhart A, Ling R, Campbell S, *et al*. *Teens and mobile phones*. Washington, DC: Pew Internet & American Life Project, Pew Research Center, 2010.
3 Brown JD, Witherspoon EM. The mass media and American adolescents' health. *J Adolesc Health* 2002;31(6 Suppl):153–70.
4 Strasburger VC, Jordan AB, Donnerstein E. Children, adolescents, and the media: health effects. *Pediatr Clin North Am* 2012;59:533–88.
5 Nunez-Smith M, Wolf E, Huang HM, *et al*. *Media and child and adolescent health: a systematic review*. San Francisco: Common Sense Media, 2008.
6 Owens J, Maxim R, McGuinn M, *et al*. Television-viewing habits and sleep disturbance in school children. *Pediatrics* 1999;104:552.
7 Sharif I, Wills TA, Sargent JD. Effect of visual media use on school performance: a prospective study. *J Adolesc Health* 2010;46:52–61.
8 Johnson JG, Cohen P, Kasen S, *et al*. Extensive television viewing and the development of attention and learning difficulties during adolescence. *Arch Pediatr Adolesc Med* 2007;161:480–6.
9 Primack BA, Swanier B, Georgiopoulos AM, *et al*. Association between media use in adolescence and depression in young adulthood: a longitudinal study. *Arch Gen Psychiatry* 2009;66:181–8.
10 Anderson P, de Bruijn A, Angus K, *et al*. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcohol* 2009;44:229–43.
11 Slater SJ, Chaloupka FJ, Wakefield M, *et al*. The impact of retail cigarette marketing practices on youth smoking uptake. *Arch Pediatr Adolesc Med* 2007; 161:440–5.
12 Sherriff A, Maitra A, Ness AR, *et al*. Association of duration of television viewing in early childhood with the subsequent development of asthma. *Thorax* 2009;64:321–5.
13 Dennison BA, Erb TA, Jenkins PL. Television viewing and television in bedroom associated with overweight risk among low-income preschool children. *Pediatrics* 2002;109:1028–35.
14 Hogan MJ, Strasburger VC. Body image, eating disorders, and the media. *Adolesc Med State Art Rev* 2008;19:521–46. x-xi.
15 Braun-Courville DK, Rojas M. Exposure to sexually explicit Web sites and adolescent sexual attitudes and behaviors. *J Adolesc Health* 2009;45:156–62.
16 Federman J. *National television violence study III*. Thousand Oaks, CA: Sage, 1998.
17 Paik H, Comstock G. The effects of television violence on antisocial behavior: a meta-analysis. *Commun Res* 1994;21:516–46.
18 Aufderheide P. Media literacy: from a report of the national leadership conference on media literacy. In: Kubey RW, ed. *Media literacy in the information age*. New Brunswick: Transaction, 1997:79–86.
19 Potter WJ. *Theory of media literacy: a cognitive approach*. Thousand Oaks, CA: Sage, 2004.
20 McCannon B. Media literacy/media education. In: Strasburger VC, Wilson BJ, Jordan AB, eds. *Children, adolescents, and the media*. 3rd edn. Los Angeles, CA: Sage, 2014:507–58.
21 Potter WJ. *Media literacy*. 6th edn. Thousand Oaks, CA: Sage, 2012.
22 American Academy of Pediatrics. *Joint statement on the impact of entertainment violence on children*. Washington, DC: Congressional Public Health Summit. http://www2.aap.org/advocacy/releases/jstmtevc.htm (accessed 29 May 2012).
23 Council on Communications and Media. Media violence. *Pediatrics* 2009;124:1495–503.
24 Council on Communications and Media. Policy statement—media education. *Pediatrics* 2010;102:341.
25 Thoman E, Jolls T. Media literacy education: lessons from the center for media literacy. In: Schwarz G, Brown PU, eds. *Media literacy: transforming curriculum and teaching*. Malden: National Society for the Study of Education, 2005:180–205.
26 Bergsma LJ, Carney ME. Effectiveness of health-promoting media literacy education: a systematic review. *Health Educ Res* 2008;23:522–42.
27 Cantor J, Wilson BJ. Media and violence: intervention strategies for reducing aggression. *Media Psychol* 2003;5:363–403.
28 Huesmann LR, Eron LD, Klein R, *et al*. Mitigating the imitation of aggressive behaviors by changing children's attitudes about media violence. *J Pers Soc Psychol* 1983;44:899–910.
29 Nathanson AI, Cantor J. Reducing the aggression-promoting effect of violent cartoons by increasing children's fictional involvement with the victim: a study of active mediation. *J Broadcasting Electron Media* 2000;44:125–42.
30 Robinson TN, Wilde ML, Navracruz LC, *et al*. Effects of reducing children's television and video game use on aggressive behavior: a randomized controlled trial. *Arch Pediatr Adolesc Med* 2001;155:17–23.
31 Rosenkoetter LI, Rosenkoetter SE, Ozretich RA, *et al*. Mitigating the harmful effects of violent television. *J Appl Dev Psychol* 2004;25:25–47.
32 Sprafkin J, Watkins LT, Gadow KD. Efficacy of a television literacy curriculum for emotionally disturbed and learning disabled children. *J Appl Dev Psychol* 1990;11:225–44.
33 Vooijs MW, van der Voort THA. Teaching Children to Evaluate Television Violence Critically: the impact of a Dutch schools television project. *J Educ Television* 1993;19:139–52.
34 Wade T, Davidson S, O'Dea JA. A preliminary controlled evaluation of a school-based media literacy program and self-esteem program for reducing eating disorder risk factors. *Int J Eat Disord* 2003;33:371–83.

35 Webb T, Martin K. Evaluation of a US school-based media literacy violence prevention curriculum on changes in knowledge and critical thinking among adolescents. *J Child Media* 2012;6:430–49.
36 Bergsma LJ. Empowerment education. *Am Behav Sci* 2004; 48:152–64.
37 Orpinas P, Parcel G, McAlister A, *et al*. Violence prevention in middle schools: a pilot evaluation. *J Adolesc Health* 1995;17:360–71.
38 Centers for Disease Control and Prevention. The effectiveness of universal school-based programs for the prevention of violent and aggressive behavior. *MMWR* 2007;56 (No. RR-7):1–12.
39 Prochaska JO, DiClemente CC. *The transtheoretical approach: towards a systematic eclectic framework*. Homewood, IL: Dow Jones Irwin, 1984.
40 Hoffner C, Plotkin RS, Buchanan M, *et al*. The Third-Person effect in perceptions of the influence of television violence. *J Commun* 2001;51:283–99.

Evaluation of a school-based violence prevention media literacy curriculum

Kathryn R Fingar and Tessa Jolls

Inj Prev published online August 16, 2013
doi: 10.1136/injuryprev-2013-040815