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Reducing Sexual Victimization Among Adolescent Girls: A Randomized Controlled Pilot Trial of My Voice, My Choice

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Despite extensive efforts to develop and implement programs to prevent sexual violence, few programs have empirically-demonstrated efficacy. The primary exceptions are programs that emphasize risk-reduction skills; yet even these programs are not consistently effective. This study seeks to add to the literature by evaluating the effects of My Voice, My Choice (MVMC), a 90-minute assertive resistance training program that emphasizes skill practice in an immersive virtual environment (IVE). We hypothesized that MVMC would reduce male-to-female sexual victimization among adolescent girls over a 3-month follow-up period. We also examined whether these results would generalize to other forms of male-to-female relationship violence and to girls' psychological distress. Eighty-three female students from an urban public high school were randomized to MVMC (n = 47) or to a wait-list control condition (n = 36); 78 provided data over the 3-month follow-up period. Participants assigned to MVMC were less likely than control participants to report sexual victimization during the follow-up period. Our results also suggest that MVMC reduced risk for psychological victimization and for psychological distress among participants with greater prior victimization at baseline. The promising results of this pilot trial suggest that MVMC may help girls evade male-to-female relationship violence.

Keywords: teen dating violence; sexual violence; prevention; assertiveness; virtual reality

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ONE QUARTER TO ONE HALF OF WOMEN in the U.S. are victims of sexual violence in their lifetime, most commonly in their teens or early twenties (U.S. Department of Justice, 2006) and most often perpetrated by someone they know (Testa, VanZile-Tamsen, & Livingston, 2007). Sexual victimization is associated with numerous immediate and long-term deleterious effects (Baker & Sommers, 2008; Campbell, Dworkin, & Cabral, 2009; Littleton, Axsom, & Grills-Taquechel, 2009; Littleton & Henderson, 2009). Moreover, experiencing any type of interpersonal violence (e.g., sexual, physical, psychological) dramatically increases the risk of future revictimization (Finkelhor, Ormord, & Turner, 2007; Macy, 2008). As a result, preventing sexual violence has become a high priority for high schools and colleges. Unfortunately, although many sexual violence prevention programs have been developed, few have been rigorously evaluated, and even fewer have been shown to actually reduce sexual victimization (Anderson & Whiston, 2005; Morrison, Hardison, Mathew, & O'Neil, 2004).

One of the most common types of prevention programs focuses on reducing risk for victimization (in the criminology literature, this is often referred to as target hardening; Hummer & Preston, 2006). Risk-reduction programs are designed to raise awareness about sexual violence, challenge rape-supportive beliefs, and teach skills for identifying and escaping threatening situations, thereby helping individuals protect themselves (Morrison et al., 2004). Such programs are typically psycho-educational in nature, and are usually targeted at females, primarily because females are at greater risk than males for sexual victimization (U.S. Department of Justice, 2006). Unfortunately, risk-reduction programs, as a group,

have only small-to-moderate effect sizes on victimization (mean weighted effect size of d = .10 across 13 studies) (Anderson & Whiston, 2005). However, risk-reduction programs that have a more specific (and typically more thorough) focus on self-protection skills tend to have larger effect sizes, compared to those that are broader in their coverage of topics or focus primarily on raising awareness and/or changing beliefs (Morrison et al., 2004). Still, not all programs that focus on self-protection succeed in reducing victimization (Anderson & Whiston, 2005; Morrison et al., 2004). One possible reason is that, although skills may be taught and demonstrated, there is typically limited opportunity for participants to practice skills or to receive feedback on their skill mastery. The lack of practice and corrective feedback may result in poor skill acquisition if the skills are relatively new to participants or if they find self--protection behaviors challenging.

The current study builds upon the existing literature on the prevention of sexual violence by evaluating the efficacy of My Voice, My Choice (MVMC), a program designed to reduce sexual victimization by teaching adolescent girls a specific set of self-protection skills—assertive resistance—and providing them with multiple opportunities to practice skills in realistic simulations. MVMC targets assertive resistance because there is consistent evidence that girls and women who engage in such behaviors (e.g., saying "no" firmly, yelling, or physically fighting back) are more likely to escape a sexually coercive situation without being raped, compared to those who engage in more passive (e.g., freezing or crying) or polite (e.g., explaining or apologizing) resistance (Ullman, 2007). Moreover, research with actual and potential perpetrators of sexual violence indicates that girls and women with a confident, assertive self-presentation are less likely to be identified as potential victims (Book, Costello, & Camilleri, 2013; Parks, Hequembourg, & Dearing, 2008; Sakaguchi & Hasegawa, 2006) and that assertive resistance is more likely to be perceived as true rather than "token" refusal (Garcia, 1998). In addition, there is experimental evidence suggesting that training in assertive resistance can reduce the likelihood of sexual victimization (e.g., Gidycz et al., 2001; Simpson Rowe, Jouriles, McDonald, Platt, & Gomez, 2012). Thus, correlational and experimental data are consistent with a theorized causal relation: Assertive resistance in response to unwanted sexual advances or sexual coercion may help girls and women escape potentially dangerous interpersonal situations and reduce likelihood of harm.

Extensive research on skill acquisition indicates that skills learned under conditions similar to those in which they are to be used are more likely to generalize to the "real world" than skills learned under dissimilar conditions (Eich, 1995; Forgas, 2008). The real-world context for self-protection skills is that of sexual coercion or unwanted sexual advances; thus girls and women must be able to enact skills in situations that commonly cause fear and anger, are stressful, and are potentially dangerous (O'Sullivan, Byers, & Finkelman, 1998). Simulation-based learning offers a mechanism to learn and practice skills under circumstances that more closely approximate situations in which they might be applied (Jouriles, McDonald, et al., 2009). Simulations have been used in commercial and military aviation (e.g., flight simulators) for decades (de Winter, Dodou, & Mulder, 2012), and are currently used in fields ranging from the military to medicine (e.g., physicians conduct clinical exams with "standardized patients" who present with particular configurations of symptoms) (Lane, Hood, & Rollnick, 2008; Van Hasselt, Romano, & Vecchi, 2008).

Based on research that supports the benefits of behavioral practice for learning social skills (Mueser & Bellack, 2007; Spranger, Schatz, & Knopf, 2008), MVMC provides participants opportunities to practice assertive resistance and to receive feedback on their use of these skills. This practice is conducted in an immersive virtual environment (IVE), using simulations of situations that pose potential risk for sexual victimization. An IVE is a computer-simulated environment, created using virtual-reality technology that is designed to help participants suspend "normal" reality and experience a "new" reality. In this research, coercive situations that sometimes occur between teens (e.g., sitting next to an adolescent boy in his bedroom when he is trying to convince the participant to kiss him) are simulated in the IVE, so that the participant experiences herself as "in" the coercive situation. IVEs create a more realistic and immersive "sexually coercive" situation that elicits greater negative emotion than face-to-face role plays (Jouriles et al., 2009, 2011) and have been used successfully in research on sexual coercion and physical violence (e.g., Jouriles, Simpson Rowe, McDonald, & Kleinsasser, 2014; Slater et al., 2013).

Repeated practice of assertive resistance in simulated high-risk situations might be especially beneficial for girls and women who have suffered previous sexual victimization, because they are less likely than nonvictims to respond to sexually coercive behavior with assertive resistance (e.g., Gidycz, Van Wynsberghe, & Edwards, 2008; Jouriles et al., 2011; Katz, May, Sorenson, & DelTosta, 2010). One explanation for this finding is that previously victimized women are at greater risk for trauma symptoms and/or physiological arousal when faced with sexual coercion, which can lead them to feel overwhelmed

and unable to respond (e.g., Fortier et al., 2009; Messman-Moore, Walsh, & DiLillo, 2010). If so, repeated practice in simulated high-risk situations may offer a form of exposure, reducing the potential effects of trauma symptoms or arousal on future behavioral responses. Practice also has the potential to provide previously victimized girls or women with successful experiences of resisting unwanted sexual advances and to help them overcome feelings of helplessness or powerlessness. The current study evaluates whether the effects of MVMC are moderated by prior victimization.

The current study further extends the literature by evaluating whether effects of a program focused on reducing sexual violence through training and practice in assertive resistance extend to other forms of male-to-female violence. There is increasing evidence that the various types of victimization in childhood and adolescence are correlated (Hamby, Finkelhor, & Turner, 2012). For example, victims of sexual violence also tend to be victims of physical and psychological relationship violence. There is speculation that certain characteristics of children and adolescents "act as magnets for victimization" (Finkelhor, 2008, p. 56), and a case can be made that difficulties with assertive resistance (e.g., enforcing boundaries and stating wishes in a clear, confident manner) is one of these characteristics. Moreover, the ability to assertively resist unwanted behaviors is considered an important skill for fostering healthy teen relationships *in general*, and for avoiding potentially dangerous relationships during adolescence (e.g., Wolfe et al., 2003). In short, there are reasons to believe that the development of assertive resistance skills might have positive effects on reducing other forms of interpersonal victimization.

We also explored the effects of MVMC on psychological distress. Certain forms of interpersonal victimization, such as experiencing psychological aggression (e.g., being insulted, ridiculed, the subject of malicious rumors) occur frequently in teen relationships (Jouriles, Garrido, Rosenfield, & McDonald, 2009), and all forms of interpersonal violence victimization (sexual, physical, and psychological) are associated with emotional distress (Ackard & Neumark-Sztainer, 2002; Callahan, Tolman, & Saunders, 2003; Jouriles et al., 2009). Moreover, the continual experience of unpleasant events, even minor ones, over a period of time can damage psychological health (Kanner, Coyne, Schaefer, & Lazarus, 1981). We reasoned that an intervention that reduces victimization may have the added benefit of reducing distress.

In sum, MVMC was designed to reduce male-to-female sexual victimization among adolescent girls by providing them training and realistic practice with assertive resistance skills. MVMC is distinct from most other violence prevention programs in at least a couple of important ways. First, the focus of MVMC is on acquisition of one particular set of skills, assertive resistance, as opposed to covering a broad array of topics. Because of this focus, considerable time can be spent on *practicing* skills, with feedback and coaching to assist participants in mastering the skills and gaining confidence in their ability to use them when needed. Second, MVMC makes use of IVEs to allow participants to practice skills in more realistic situations, which is theorized to be important for newly learned skills to generalize to situations outside of the learning environment. It is also noteworthy that MVMC is quite brief (one 90-minute session); it was designed to be economically and logistically feasible for schools to adopt and use as a stand-alone program or as an adjunct to existing programs.

This pilot study is a randomized controlled trial examining the effects of MVMC on sexual victimization and evaluating whether the effects generalize to other forms of male-to-female violence victimization (i.e., psychological and physical) and to psychological distress among adolescent girls. We hypothesized that, compared to participants in the control condition, those in the MVMC condition would be less likely to experience sexual victimization, nonsexual victimization (i.e., physical and psychological), and psychological distress. We also evaluated whether a history of previous victimization moderated program effects. This is important because sexual victimization prevention efforts have frequently been less efficacious for girls and women who had already been sexually victimized (Morrison et al., 2004); however, as suggested above, there are reasons to expect MVMC to be effective with this group.

Method

SAMPLE

Students were recruited from an all-girls urban public high school serving a predominantly minority population in a large Southwestern city. All students (average yearly enrollment of 220 across 9th through 12th grades) enrolled at the high school were eligible to participate. The study was advertised through announcements in classes, posters distributed around the school, and discussions with study staff, who were regularly available during lunch periods. Students who wished to participate were given a letter describing the study and parental consent and youth assent forms, printed in English and Spanish. Students were instructed to return the signed parental consent and youth assent forms to study staff if they wished to participate. Eighty-five students returned consent forms and 83 (38% of the students enrolled at the school, 83/220) completed the baseline

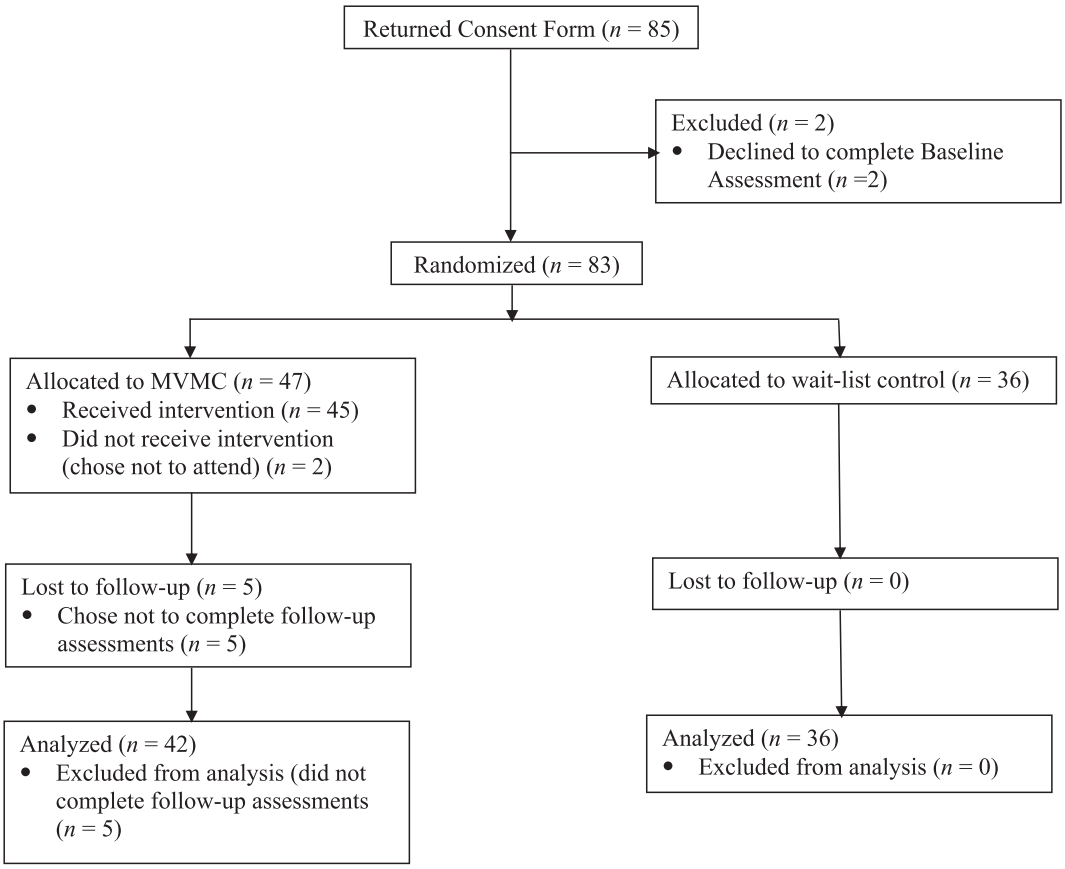

FIGURE 1 CONSORT diagram of participant flow and attrition.

assessment, which was conducted at school, usually during lunch or a free period.

The 83 girls who completed the baseline assessment were randomized to the MVMC condition (n = 47) or to a wait-list control condition (n = 36). Participant age ranged from 14 to 18 (M = 15.63, SE = .95). There was fairly even distribution across the 9th (23/83, 28%), 10th (28/83, 34%), and 11th grades (28/83, 34%), but only 4 out of 83 participants (4%) were in the 12th grade. The sample was predominantly Hispanic (66/83, 80%), with 17% (14/83) African American, 2% Non-Hispanic White (2/83), and 1% Asian (1/83). Slightly over half of participants reported ever having had a romantic relationship (46/83, 55%) and slightly over one quarter were currently in a dating relationship at the time of the study (22/83, 27%), all with males. Current partners ranged in age from 14 to 19 (M = 16.77, SD = 1.45) and were, on average, one year older than the participants (M = 1.05, SD = 1.36).

PROCEDURES

All procedures were approved by the Institutional Review Boards of the participating school district and the authors' university. Using a random-numbers table generated prior to initiating the study, participants were randomized to either MVMC or to the control condition immediately after completing the baseline assessment. They were then informed of the condition they were assigned to, and those assigned to the MVMC condition were scheduled for their MVMC session. MVMC sessions were scheduled after school, based on student and facilitator availability, once at least 2 students assigned to the MVMC condition were available for a particular session time (so that the sessions could be conducted in groups of at least 2). On average, students randomized to MVMC attended the session approximately 1 week after the baseline assessment (M = 8.5 days, SD = 5.9). A total of 14 MVMC groups were conducted. Groups ranged in size from 2 to 4 participants and had, on average, 3.3 participants (SD = 0.7).

Because repeated assessments of victimization experiences covering shorter periods of time can provide more valid data on victimization than a single assessment of experiences over a longer period of time (Jouriles, McDonald, Garrido, Rosenfield, & Brown, 2005), follow-up assessments were completed monthly for 3 months after baseline, via a secure website. Participants received a $10 gift card to a local store for each assessment and for the MVMC session to compensate them for their time (possible

total of $50). Participants in the control group were allowed to participate in MVMC upon completion of the final assessment to ensure that all participants received the same potential benefits.

Overall, attrition was low (see Figure 1 for a CONSORT diagram [Schulz, Altman, & Moher, 2010] outlining participant flow). Seventy-five percent (35/47) of participants in the MVMC condition and 83% (30/36) in the control condition completed all three follow-up assessments; 13% (6/47) in MVMC and 11% (4/36) in the control condition completed at least two follow-up assessments; 2% (1/47) in MVMC and 6% (2/36) in the control condition completed only one follow-up; and 11% (5/47) in MVMC and 0 in the control condition completed no follow-up assessments. Two of the five in MVMC who did not provide follow-up data also did not participate in the MVMC session. This resulted in a final sample of 78 (42 in the MVMC condition and 36 in the control condition) for which we had data for at least one follow-up assessment. There were no differences between participants who completed the study and those who did not on any of the measured demographic or study variables.

In the state in which this study was conducted, actual or suspected sexual violence perpetrated by someone 17 years of age or older against a child must be reported to the child welfare system, unless the age difference between the perpetrator and child is no more than 3 years. There were no such incidents reported in this study (participants were not explicitly asked about violence perpetrated by adults and none reported such violence to study staff).

My Voice, My Choice

MVMC was administered as a single 90-minute group session. Groups of 2 to 4 participants received training in assertive resistance skills from a female facilitator and practiced skills in IVE simulations of sexually threatening situations. The participants experienced the IVE through the use of a virtual-reality headset. The virtual environment for all simulations was a virtual bedroom, in which the participant was seated on a couch to the right of a male avatar. In real space, the male actor, who also provided the verbal component of the simulations, was seated to the left of the participant, so that his speech would be consistent with the position of the virtual avatar. The actor controlled the avatar's movements and facial expressions using the computer program to coincide with his speech.

MVMC sessions began with approximately 30 minutes of discussion and modeling of assertive resistance skills. The female facilitator led the discussion and demonstrated assertive and nonassertive resistance in (nonvirtual) role-play interactions with the male actor. Next, the facilitator introduced the practice portion of the session, which lasted approximately 60 minutes. Each participant completed three virtual simulations, in which the actor engaged in verbal sexual coercion of increasing levels of severity. Participants were informed prior to beginning the simulations that they would never be touched and that they could stop a simulation at any time. The first simulation was relatively easy; the actor engaged in only mild coercion and stopped his behavior as soon as the participant used assertive resistance. This allowed the participants to become accustomed to the IVE, to introduce them to enacting a simulation in the presence of the other group members, and to have an initial success experience using assertive resistance. The second and third simulations were more challenging: The actor became increasingly aggressive in his speech and was more persistent in the face of assertive resistance. After each simulation, the participant received constructive feedback from the female facilitator and fellow group members (each participant completed different simulations at each of the three levels so that participants would not simply imitate each other). Feedback emphasized both what the participant did well and ideas for additional ways to engage in assertive resistance for the next simulation (e.g., use a firmer voice tone, refuse without apologizing, etc.). Simulations were 2 to 3 minutes long, but could be repeated until the participant successfully demonstrated assertive resistance. Upon completion of the final set of simulations, the facilitator led a concluding conversation about the experience and about the program as a whole.

Facilitators and Training

The four female facilitators were clinical psychology doctoral students with at least one year of clinical training. The four male actors were either advanced undergraduate students or recent college graduates. Facilitators and actors underwent approximately 20 hours of training, which included information about interpersonal violence and assertive resistance, review of video recordings of prior groups, completion of a MVMC group as a participant (for facilitators only), completion of practice groups as a facilitator/actor with study staff acting as participants, and training in research ethics. Actors received training in each of the simulations, including the context of the situation to be simulated, the type of language to use, when to escalate and cease coercive behavior (e.g., when the participant effectively used assertive resistance skills), and how severe coercion should be. Facilitators and actors were all trained to be sensitive to

participant distress and to stop a simulation and help a participant to begin the practice again if she appeared unable to utilize assertive resistance skills. If a participant became too distressed to continue, facilitators and actors were instructed to refer her to the high-school guidance counselor (this was never necessary). Once facilitators and actors completed training, they participated in weekly video-supervision of groups.

MEASURES

Sexual and Nonsexual Violence Victimization

Participants completed the 25 victimization items from the Conflict in Adolescent Dating Relationships Inventory (CADRI) at each assessment; positive relationship items were interspersed with the violence items to reduce the negative impact of the questionnaire (positive items were not included in these analyses). The CADRI is a reliable and well-validated measure (Wolfe et al., 2001) that is frequently utilized to assess violence in adolescent relationships and measures five categories of victimization. The sexual victimization (e.g., "A boy touched me sexually when I didn't want him to") and physical victimization (e.g., "A boy slapped me or pulled my hair") subscales each contain four items. The remaining three subscales measure psychological victimization: threatening behavior (4 items, e.g., "A boy deliberately tried to frighten me"), relational abuse (3 items, e.g., "A boy spread rumors about me"), and verbal abuse (10 items, e.g., "A boy ridiculed me or made fun of me in front of others"). Although the CADRI was originally developed to refer to incidents that occurred within a dating relationship, we asked participants to consider things that any boy had done ("This could be a boyfriend or a boy you were dating, a boy who is just a friend, or even a boy that you didn't know") as teen relationships are often ambiguous in definition (Madsen & Collins, 2011), and we wanted to cast a broad net in measuring violence victimization. We focused on acts committed by males because the intervention targets male-to-female violence.

Participants rated the frequency of each item in the past month at each of the follow-up assessments; however, because few items occurred more than once at any assessment, item scores were re-coded as 0 = *Did not occur* or 1 = *Occurred*. At the baseline assessment, participants were also asked whether each item had occurred at any time, not just in the past month; also coded as 0 = *Did not occur* or 1 = *Occurred*. Subscale scores were generated by summing the number of items endorsed at any given assessment. However, because participants rarely reported multiple items of sexual victimization or physical victimization, these subscale scores were re-coded as dichotomous values for sexual victimization and for physical victimization in the past month: 0 = *Did not occur* or 1 = *Occurred*.

For psychological victimization, the three subscales (threatening behavior, relational abuse, and verbal abuse) were combined into a single, overall subscale. In contrast to sexual and physical victimization, participants often reported multiple items of psychological victimization, making it possible to examine psychological victimization as a continuous variable (coefficient alpha ranged from .75 to .82).

Finally, to control for previous victimization, we summed the lifetime reports of all items (sexual, physical, and psychological) at the baseline assessment (coefficient alpha .88).

Psychological Distress

Participants completed the Trauma Symptom Checklist (TSC; Elliott & Briere, 1992) at each assessment to measure psychological distress. The TSC is a reliable and well-validated measure that has been used extensively in evaluations of adolescent mental health. Items from the PTSD, depressive, and anger control symptom scales were included. Because scores were highly correlated across the 3 domains at each assessment (correlations ranged from .45 to .80, all $ps < .001$), we averaged them to obtain an overall distress *t*-score (for the combined scale, $.80 \leq \alpha \leq .87$ across the 4 assessments).

Participant Satisfaction and Engagement in MVMC

Participants in the MVMC condition completed a 5-item questionnaire after the group session (*How much did you enjoy the program? Would you recommend it to other girls? Do you think the program will be helpful to you in the future? Will you use the skills you learned? How involved were you during the program?*). Items were rated on a 5-point Likert scale, ranging from 0 = *Not at All* to 4 = *Extremely*. Using the same 5-point Likert scale, the facilitator and actor who administered each group also rated the degree to which each participant was (a) engaged and (b) involved in the group discussion and the skills practice. Facilitator and actor ratings were averaged separately.

Intervention Fidelity

MVMC sessions were video-recorded, and facilitator and actor adherence to the MVMC protocol was rated by trained observers. Observers coded the coverage of 20 key aspects of the program (e.g., discussing the definition of assertiveness, when and why it is important to be assertive, and barriers to engaging in assertive resistance; completion of 3

sets of simulations with feedback and coaching for each group member). Each element was coded as 0 = *Absent* or 1 = *Present*. Due to technical difficulties (failure to record the entire session), the full group session could not be rated for fidelity for 6 of the 14 groups (43%). Since the elements of the program were always administered in the same order, the average score across all available items (i.e., items for the elements that were recorded) was calculated.

DATA ANALYTIC APPROACH

Ideally, outcome data for all participants who were randomized to a condition would be included in the final analyses, regardless of whether they completed the condition to which they were assigned (i.e., intention to treat). However, as with most randomized trials, some participants did not provide outcome data (in this case, 5/83; 6%). Alshurafa and colleagues (2012) outline several options for addressing missing outcome data (MOD): (a) Individuals with MOD not considered in the analysis (complete/available case analysis); (b) Imputation of MOD; or (c) A combination of the first two approaches. We utilized the latter. First, we examined the results for the 78 participants who completed at least one follow-up assessment (the unimputed sample); second, we utilized EM imputation based on baseline data to impute missing outcomes (data for 31/218 [12%] potential assessments) and provide results for an imputed sample of 83.

We utilized multi-level modeling (MLM) to test our hypotheses (Raudenbush & Bryk, 2002). Maas and Hox (2005) have demonstrated that multi-level modeling (MLM) produces unbiased regression coefficients (treatment effects) in samples as small as 30. Thus, the study was sufficiently powered to evaluate treatment effects using MLM. The three follow-up assessments (Level 1) were nested within individuals (Level 2). A grand-mean centered measure of time since the first follow-up assessment, in weeks, was included at Level 1 to control for any temporal change in the dependent variables during the follow-up period. Since sexual and physical victimization were examined dichotomously (0 = *Did Not Occur,* 1 = *Occurred*), analyses with these dependent variables were conducted using a Bernoulli distribution with population-average results. Given the greater number of acts of psychological victimization reported, this variable was examined continuously, as was the measure of psychological distress. Robust standard errors are reported throughout.

Following Singer and Willett (2003), we computed effect sizes by calculating the percent of between-subjects (level 2) unexplained variability that was accounted for by the main or interaction effect (that is, the percent of individual differences in occurrence of the dependent variable during the follow-up period that can be explained by the main or interaction effect). Due to evidence that age, relationship status, race/ethnicity, and psychological distress are associated with violence victimization and assertive resistance (Ackard & Neumark-Sztainer, 2002; U.S. Department of Justice, 2006; Yoshioka, 2000), all four variables were controlled at Level 2. The independent variables were intervention condition (0 = *Control,* 1 = *MVMC*), prior victimization, and the Condition × Prior Victimization interaction. All IVs were grand-mean centered.

Results

PRELIMINARY ANALYSES

Descriptive statistics and baseline group comparisons are presented in Table 1. At baseline, 35% (29/83) of participants reported at least one incident of lifetime sexual victimization and 35% (29/83) reported at least one incident of lifetime physical victimization. Participants reported an average of 5.22 (*SD* = 3.91) items of lifetime psychological victimization at baseline (*range:* 0–14). Average

Table 1
Baseline Descriptive Statistics

	MVMC (n = 47)		*Control (n = 36)*		*Statistic*
Variable	*M* (*SD*)	*Range*	*M* (*SD*)	*Range*	*t*(81)
Age	15.64 (.92)	14-18	15.61 (.99)	14-18	.13
Lifetime psychological victimization	5.49 (3.72)	0-14	4.86 (4.18)	0-13	.72
Baseline psychological distress	47.99 (6.32)	36-65	45.72 (6.83)	36-65	1.57
	n (%)		*n* (%)		χ^2 (1, 83)
Hispanic	36 (77%)		30 (83%)		.57
Ever in a relationship	26 (55%)		20 (56%)		.00
Lifetime sexual victimization	15 (32%)		14 (39%)		.44
Lifetime physical victimization	17 (36%)		12 (33%)		.07

* $p < .05$, ** $p < .01$, *** $p < .001$.

baseline psychological distress was in the nonclinical range (*t*-score < 60), (M = 47.00, SD = 6.60), but 19% (n = 16/83) of participants reported symptoms in the clinical range (*t*-score ≥ 60) on at least one of the three composite measures of psychological distress. As expected, prior sexual victimization was positively correlated with prior physical (r = .26, p = .02) and psychological (r = .48, p < .001) victimization, and baseline psychological distress was positively correlated with prior sexual (r = .47, p < .001), physical (r = .34, p < .001), and psychological (r = .50, p < .001) victimization. The intervention and control groups did not differ on any of the demographic or study variables at baseline.

MVMC participants were quite satisfied with the program, M = 3.72, SD = .29, and their engagement was rated as moderate by facilitators, M = 2.89, SD = .76, and actors, M = 2.68, SD = .63 (both on a 0–4 scale). Intervention fidelity was strong, M = .95, SD = .06 (on a 0–1 scale).

INTERVENTION EFFECTS

Sexual Victimization

Utilizing the non-imputed sample, 15% (12/78) of participants reported at least one incident of sexual victimization during the 3-month follow-up period. Within the MVMC condition, 10% (4/42) of participants reported sexual victimization, compared to 22% (8/36) in the control condition. MLM analyses (first two columns of Table 2) revealed a main effect of condition: MVMC participants were less likely to report sexual victimization during follow-up than were participants in the control group, b = −.77, OR = .47, $t(70)$ = −2.29, p < .05. The percent of unexplained variability between subjects accounted for by treatment condition was 35.4%. That is, approximately 35% of individual differences in the occurrence of sexual victimization over the 3-month follow-up period was explained by assignment to condition. In addition, baseline psychological distress was positively associated with sexual victimization during follow-up, b = .09, OR = 1.10, $t(70)$ = 3.87, p < .001.

Within the imputed sample, 16% (13/83) of participants reported sexual victimization; 4/47 (9%) in the MVMC condition and 9/36 (25%) in the control condition. Analysis of the imputed sample (presented in italics below the non-imputed sample in Table 2) yielded an identical pattern of results as the analysis of the non-imputed sample.

Physical Victimization

Twenty-two percent (17/78) of participants in the non-imputed sample reported physical victimization during the follow-up period; 21% (9/42) of those in the MVMC condition and 22% (8/36) in the control condition. As shown in the second two columns of Table 2, none of the Level-2 variables

Table 2
MVMC Effects on Sexual and Nonsexual Victimization

Variable	*Victimization Type*				
	Sexual		*Physical*		*Psychological*
	b (*SE*)	*OR* (95% *CI*) [a]	*b* (*SE*)	*OR* (95% *CI*) [a]	*b* (*SE*)
Intercept	−2.87 (.16)***	0.06 (.04, .08)	−2.05 (.17)***	0.13 (.09, .18)	1.68 (.17)***
	*−2.88 (.14)****	*0.06 (.04, .08)*	*−2.16 (.16)****	*0.12 (.08, .16)*	*1.68 (.16)****
Age	0.01 (.20)	1.01 (.68, 1.50)	−0.11 (.18)	0.90 (.62, 1.30)	−0.15 (.18)
	−0.02 (.17)	*0.98 (.69, 1.38)*	*−0.08 (.17)*	*0.92 (.66, 1.28)*	*−0.16 (.15)*
Hispanic ethnicity (*0-No, 1-Yes*)	0.40 (.42)	1.49 (.64, 3.45)	−0.24 (.49)	0.79 (.30, 2.09)	−0.83 (.48)
	0.53 (.36)	*1.70 (.83, 3.47)*	*−0.16 (.48)*	*0.85 (.33, 2.21)*	*−0.89 (.44)**
Relationship status (*0-Never, 1-Ever*)	0.78 (.38)*	2.18 (1.01, 4.68)	−0.33 (.45)	0.72 (.29, 1.78)	0.85 (.41)*
	*0.70 (.33)**	*2.02 (1.05, 3.91)*	*−0.24 (.44)*	*0.79 (.33, 1.89)*	*0.89 (.38)**
Baseline psychological distress	0.09 (.02)***	1.10 (1.05, 1.15)	−0.02 (.03)	0.98 (.92, 1.04)	−0.00 (.03)
	*0.09 (.02)****	*1.10 (1.06, 1.14)*	*−0.01 (.03)*	*0.99 (.94, 1.05)*	*−0.00 (.03)*
Condition (*0- Control, 1-MVMC*)	−0.77 (.33)*	0.47 (.24, .91)	0.16 (.34)	1.17 (.59, 2.31)	−0.21 (.32)
	*−0.85 (.29)***	*.43 (.24, .76)*	*0.08 (.33)*	*.109 (.57, 2.08)*	*−0.20 (.29)*
Prior victimization	−0.02 (.03)	0.98 (.93, 1.04)	0.06 (.04)	1.07 (.99, 1.15)	0.13 (.04)***
	−0.01 (.02)	*0.99 (.94, 1.04)*	*0.05 (.04)*	*1.05 (.97, 1.14)*	*0.13 (.03)****
Condition × Prior Victimization	−0.02 (.07)	0.98 (.86, 1.12)	−0.05 (.05)	0.95 (.85, 1.06)	−0.19 (.07)**
	−0.06 (.05)	*0.95 (.85, 1.05)*	*−0.06 (.05)*	*0.94 (.85, 1.05)*	*−0.19 (.06)***
Slope	0.02 (.05)	1.02 (.93, 1.12)	0.02 (.04)	1.02 (.95, 1.10)	−0.01 (.03)
	0.01 (.04)	*1.01 (.93, 1.09)*	*0.03 (.04)*	*1.03 (.96, 1.11)*	*−0.01 (.03)*

Values in italics represent results from analyses using imputed missing values.
*p < .05, **p < .01, ***p < .001;
[a] *OR* = Odds Ratio, *95% C.I.* = 95% Confidence Interval.

was associated with occurrence of physical victimization during the follow-up period. The imputed sample provided an estimate of 21% (17/83) occurrence of physical victimization (19%, 9/47, in the MVMC condition and 22%, 8/36, in the control condition). Again, as shown in Table 2, none of the Level-2 variables was associated with the occurrence of physical victimization during the follow-up period.

Psychological Victimization

The majority of participants in the non-imputed sample (73%, 57/78) reported at least one item of psychological victimization during follow-up, with a mean of 1.67 items, $SD = 1.94$, *range:* 0–8. As shown in the final column of Table 2, although there was no main effect of condition, there was a main effect of prior victimization, $b = .13$, $t(70) = 3.52$, $p < .001$ (9.1% of unexplained variability was accounted for by prior victimization), and a Condition × Prior Victimization interaction effect, $b = -.19$, $t(70) = -2.86$, $p < .01$ (11.9% of unexplained variability in psychological victimization). In the imputed sample, 81% (67/83) of participants reported at least one incident of psychological victimization (*mean* = 1.65, $SD = 1.87$, *range:* 0–8). MLM results were nearly identical for the imputed sample.

The non-imputed interaction is presented graphically in Figure 2A; greater prior victimization was associated with greater psychological victimization during the follow-up period for those in the control condition, but not for those in the MVMC condition. That is, for participants at lower risk for future victimization (those with lower prior victimization), MVMC did not reduce risk for victimization during follow-up. However, for those participants at higher risk for future victimization, MVMC was associated with less psychological victimization during follow-up.

Psychological Distress

Average psychological distress during follow-up was 43.15, $SD = 5.76$, *range*: 36–62; approximately 12% ($n = 9/78$) of participants reported clinically significant distress (t-score > 60) on one of the three composite scales at least once during the follow-up period. To examine effects of MVMC on psychological distress, we repeated our analyses, using psychological distress as the dependent variable, and adding a Condition × Baseline Psychological Distress interaction term to determine if MVMC had different effects depending on initial distress. As expected, psychological distress at baseline was positively associated with psychological distress at follow-up, $b = .48$, $SE = .10$, $t(69) = 4.87$, $p < .001$. There was no main effect of condition, $b = .31$, $SE = .95$, $t(69) = .33$, $p = .74$, or previous victimization, $b = .20$, $SE = .13$, $t(69) = 1.52$, $p = .13$. However, prior victimization moderated the association between condition and psychological distress, $b = -.55$, $SE = .28$, $t(69) = 1.96$, $p = .05$; the interaction accounted for 10.6% of unexplained between-subjects variability in psychological distress. Baseline psychological distress did not moderate the association between condition and follow-up psychological distress, however, $b = .31$, $SE = .22$, $t(69) = 1.39$, $p = .17$. In addition, the average level of psychological distress declined during follow-up, $b = -.29$, $SE = .05$, $t(77) = 5.52$, $p < .001$. As shown in Figure 2B (based on non-imputed sample), program effects on psychological distress paralleled those for psychological victimization: There was no effect of MVMC for participants with low prior victimization, but for participants with greater prior victimization, MVMC was associated with lower psychological distress.

In the imputed sample, average psychological distress was 43.03, $SD = 5.53$, *range:* 36–62. The pattern of effects using the imputed sample was almost identical for psychological distress at baseline, $b = .50$, $SE = .09$, $t(74) = 5.39$, $p < .001$, condition, $b = .17$, $SE = .12$, $t(74) = 1.41$, $p = .16$, previous victimization, $b = .17$, $SE = .12$, $t(74) = 1.41$, $p = .16$, Condition × Previous Victimization, = $b = -.52$, $SE = .27$, $t(74) = 1.96$, $p = .05$, Condition × Psychological Distress at Baseline, $b = .29$, $SE = .22$, $t(74) = 1.34$, $p = .18$, and the longitudinal change in psychological distress during the follow-up period, $b = -.29$, $SE = .04$, $t(82) = 6.41$, $p < .001$.

Discussion

Our findings suggest that MVMC, which consists of a single 90-minute session that teaches adolescent girls how to assertively resist unwanted sexual advances and gives them opportunities to practice these skills in an IVE, can reduce risk of sexual victimization for a 3-month period following the intervention. We believe this line of research provides important support for prevention efforts that target risk-reduction by training girls to use assertive resistance skills. Combined with previous work in this area (Gidycz et al., 2001; Simpson Rowe et al., 2012), the results suggest that providing the opportunity to practice and master assertive resistance skills may help adolescent girls to avoid and/or escape potentially threatening interpersonal situations. It is important to highlight, however, that the number of girls who were sexually victimized during the follow-up period was quite small (8 out of 36 participants in the waitlist condition and 4 out of 42 in the MVMC condition). Thus, although these results are promising, they are based on small numbers and should be interpreted with caution.

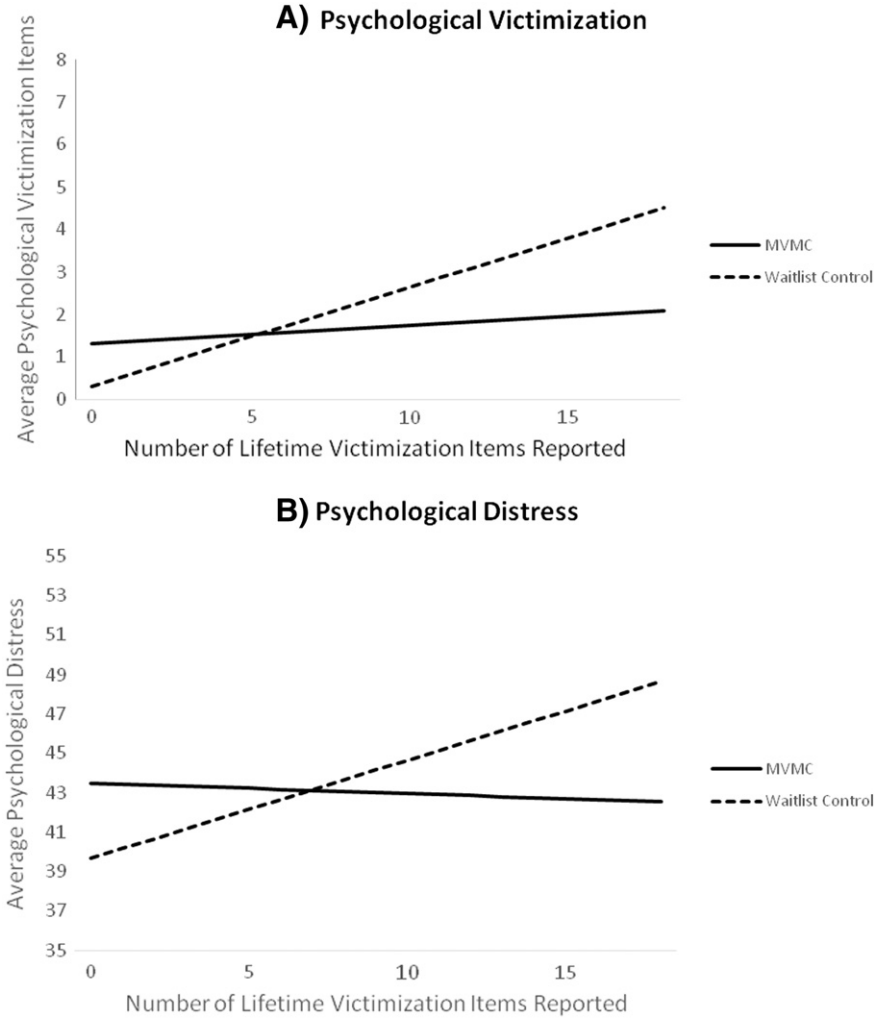

FIGURE 2 Effects of MVMC on psychological victimization and psychological distress during the follow-up period.

Our results also suggest that MVMC can reduce risk for psychological victimization and psychological distress, but only among those girls with relatively higher levels of prior victimization. This finding is particularly noteworthy because other violence prevention programs have generally been ineffective or less effective for previously victimized young women (Morrison et al., 2004). It is not clear from this study why MVMC had stronger effects on psychological victimization and psychological distress among girls with higher levels of previous victimization. One possibility is a floor effect; that is, girls with lower prior victimization were less vulnerable to future psychological victimization and psychological distress to begin with, so differences between MVMC and the control condition could not be detected over a brief follow-up period. Alternatively, the messages sent by MVMC may have been particularly useful for previously victimized girls. Specifically, MVMC emphasizes that girls have a right to stand up for themselves and that violent or coercive behavior is never acceptable. Combined with enhanced feelings of self-efficacy and empowerment as a result of mastering the assertive resistance skills, this message may have been particularly valuable for more vulnerable girls and may have had positive effects on behavior across situations as well as on general psychological well-being. It is also possible that some of these positive outcomes were intertwined. That is, reductions in victimization may have contributed to reduced psychological distress simply by reducing the presence of a significant stressor.

This study had a number of important strengths, including the randomized controlled design and a high participant retention rate. There were, however, several limitations. Specifically, the 3-month

follow-up period was short, and the sample for this pilot study was small, especially for examining moderators of program effects. Indeed, the combination of a 3-month follow-up period and small sample resulted in only 12 participants reporting sexual victimization during the follow-up period. Although the results of this study suggest positive effects of MVMC, it will be important to replicate these findings in a larger sample over a longer period of time.

There were other limitations as well. The use of a wait-list control group does not allow us to rule out the possibility that observed effects were due to nonspecific treatment factors or participant expectancies, as opposed to the assertive resistance skills taught during MVMC sessions. Moreover, measurement of program effects focused on victimization experiences, and did not include a direct assessment of assertive resistance, or assessment of whether participants successfully avoided sexually threatening situations (e.g., assertively resisted pressure to be alone with a boy before he had a chance to engage in sexual pressure). As a result, it is not clear why sexual victimization rates decreased in the MVMC condition, compared to the control condition. Furthermore, findings were based solely on self-report data. Confidence in our findings would be bolstered if we were able to provide evidence of reduced victimization from other data sources as well (e.g., official records). In addition, it is possible that aspects of campus climate might influence program results, and it is not clear if effects are generalizable across different school environments (e.g., public schools that include males and females).

It should be acknowledged that MVMC does not differ from certain other programs in terms of the primary message (i.e., sexual violence is prevalent and dangerous, and assertive resistance is an effective self-protection tool) (Anderson & Whiston, 2005; Morrison et al., 2004). Where it does differ is in its emphasis on the behavioral practice of assertive resistance skills and the use of an IVE. Specifically, participants were given multiple opportunities to practice the skills in realistically simulated sexually coercive situations, followed by feedback and the opportunity to immediately apply that feedback in subsequent practice. Such an approach is supported by skill training in many other domains (de Winter et al., 2012; Lane et al., 2008; Van Hasselt et al., 2008) and seems likely to be an important area for future violence prevention efforts.

In conclusion, if a 90-minute intervention can indeed reduce violence victimization and psychological distress for adolescent girls, this line of research is potentially of great significance. Important next steps include evaluating MVMC with a larger sample and over a longer period of time and examining potential mediators of effects (i.e., we hypothesize that assertive resistance skills mediate the effects of MVMC on victimization, but were not able to test that hypothesis in this sample). We also hope to explore its efficacy with other age groups (e.g., before younger girls begin dating and among young women who already have an established pattern of dating and sexual relationships) as well as with males. Boys and men can be victims of sexual violence as well as perpetrators (U.S. Department of Justice, 2006), and training and practice of assertive resistance skills in IVEs may help them to effectively resist sexual pressure as well as to increase awareness of and sensitivity to refusal cues from others.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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