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Project Date SMART: A dating violence (DV) and sexual risk prevention program for adolescent girls with prior DV exposure

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Abstract

This study assessed the initial feasibility, acceptability, and efficacy of an intervention aimed at reducing dating violence and sexual risk behavior in a sample of adolescent girls (ages 14-17) with prior exposure to physical dating violence (DV). One hundred and nine girls were randomly assigned to Date SMART (Skills to Manage Aggression in Relationships for Teens) or a Knowledge-only (KO) comparison group. Both intervention arms consisted of six, weekly two-hour sessions and one “booster” session 6 weeks later. Based on principles of cognitive behavioral therapy, the Date SMART intervention was designed to target common underlying skills deficits linked to both DV and sexual risk behavior in adolescent females: depression, self-regulation deficits, and interpersonal skills deficits. Assessments were administered at four time points (baseline, 3-, 6-, and 9-months). The Date SMART group was effective as reducing sexual DV involvement across the 9 month follow-up period. Both groups evidenced clinically meaningful reductions in physical, emotional, and digital DV involvement, total time in dating relationships, as well as reductions in depression. Findings indicate that delivering a DV and sexual risk prevention intervention to DV-affected adolescent girls is feasible and well-received. Furthermore, a skills-based approach that addresses the co-occurrence of DV and sexual risk behavior may be particularly useful for promoting reductions of sexual DV among high-risk adolescent girls. A future, large-scale trial with an inactive comparison condition is needed to evaluate the efficacy of Date SMART further.

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Compliance with Ethical Standards: Ethical Approval. All data collection procedures were carried out with approval from, and in compliance with, the Lifespan IRB at Rhode Island Hospital.

Informed Consent. Informed consent was obtained from all individual study participants.

Keywords

prevention; dating violence; sexually transmitted infection; HIV; adolescents

Dating violence (DV) involvement and sexual risk behavior are significant and inter-related problems during the adolescent years. Adolescent girls are at particular risk for adverse physical, mental, social, and sexual health outcomes associated with DV and sexual risk behaviors. Females, relative to males, are more likely to suffer serious injury from DV, such as being choked, burned, or beaten (Foshee, 1996; Tjaden & Thoennes, 2000) and are also more likely to suffer negative emotional or psychological consequences from DV (Campbell, 2002). DV also contributes to several STI/HIV-related sexual risk behaviors including inconsistent condom use, having multiple sexual partners, early sexual debut and alcohol use prior to sexual encounters (Silverman, Raj, & Clements, 2004; Teitelman, Dichter, Cederbaum, & Campbell, 2007; Wingood, DiClemente, McCree, Harrington, & Davies, 2001). Indeed, among teen girls who have had sexual intercourse, one in five have been in a violent dating relationship (Silverman, Raj, & Clements, 2004). Higher rates of sexually transmitted infections (STI), such as chlamydia or human papillomavirus (HPV) (Forhan et al., 2009) facilitates HIV transmission and places adolescent girls at increased risk for infertility and cervical cancer. Exposure to both sexual risk behaviors and DV is linked to future relationship violence, depression, problem substance use, posttraumatic stress and eating disorders (Callahan, Tolman, & Saunders, 2003; Chase, Treboux, & O'Leary, 2002). Given the high rates of DV and sexual risk behaviors among adolescent girls, their common co-occurrence, and the myriad of resulting adverse health outcomes, preventative interventions that target both DV and sexual risk behaviors are needed.

Programs designed to reduce community-level dating violence have not been tailored to the unique challenges of adolescent girls with histories of DV (Cornelius & Resseguie, 2007) and have not consistently affected change in DV behaviors (De La Rue, Polanin, Espelage, & Pigott, 2016). Moreover, prevention programs targeting condom use skills and sexual communication do not address the unique relationship dynamics for girls that present in violent dating relationships such as the challenge of negotiating protected sex in the context of sexual coercion. Furthermore, the co-occurrence of DV and sexual risk behaviors suggests that prevention programs would benefit from targeting both components. To the authors' knowledge there is only one existing sexual risk prevention program for girls has included dating violence prevention content (Wingood, DiClemente, Harrington, Lang, Davies, Hook, Oh, & Hardin, 2006) and found that for those with a history of DV, the intervention led to substantial reductions in sexual behavior and STIs. Although changes in DV behaviors were not a target of this intervention, findings suggest that a preventive intervention with a dual focus on DV and sexual risk reduction may be acceptable and beneficial for adolescent girls with histories of DV.

The current study developed and tested a theory-driven combined DV and sexual risk prevention program for female adolescents with histories of DV exposure. The intervention targeted mechanisms that have been linked with both DV and sexual risk in prior studies: depressive symptoms, poor self-regulation, and interpersonal skills deficits.

Depressive symptoms have been linked to behavioral risk for DV and HIV infection in prior studies (Lehrer, Buka, Gortmaker, & Shrier, 2006; Johnson, Giordano, Longmore & Manning, 2014). A 5-year longitudinal study of high school girls found that more time depressed was associated with later psychological and physical abuse (Rao et al., 1999). Also, diagnosis of major depression increases risk for unprotected sex, sexually transmitted infections, and sexual debut before age 16 (Ramrakha, 2000). There is also evidence that exposure to violence leads to worsening depression and more suicide attempts (Rao et al., 1999; Sussex & Corcoran, 2005) suggesting a harmful synergy among depressive symptoms, DV, and sexual risk behaviors.

Deficits in *self-regulation*, conceptualized as the ability to regulate emotions, attention, and behavior, have been shown to increase risk for DV and create barriers to safer sex behavior. Self-regulation deficits may create vulnerability to DV and sexual risk behaviors by impeding an adolescent's ability to resist acting on impulses (Eckhardt & Jamison, 2002; Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). DV perpetration by females in particular has been linked to hostility and antisocial behaviors (Schnurr & Lohman, 2008). Importantly self-regulation skills have been identified as a likely malleable and important component for reducing DV (Maldonado, DiLillo, & Hoffman, 2015) and sexual risk behaviors (Houck et al., 2016).

Interpersonal skills influence DV and HIV-risk outcomes as well. Indeed, coercion, dominance, jealous tactics, and conflict in romantic relationships are all associated with DV in adolescence (Capaldi, Knoble, Shortt, & Kim, 2012). Sexual risk behavior can emerge when adolescents lack the interpersonal skills necessary to negotiate sex. When a romantic relationship is characterized by intimidation and abuse, self-efficacy to negotiate safer sex behaviors (e.g. condom use) becomes even more difficult, and sexual partners may be resistant to safe behaviors (Wingood et al., 2006). Taken together these studies suggest that targeting relationship characteristics is critical to reducing DV and sexual risk behavior.

Given the literature linking depression, self-regulation and interpersonal skills deficits to DV and sexual risk behavior among adolescent girls, the Date SMART intervention was developed to target these factors. A skills-based approach was utilized based on a cognitive-behavioral framework whereby maladaptive cognitions and behaviors can be corrected with skills-based modules and activities. The developed Date SMART program is group-based so that adolescent girls have a forum to receive peer support. Skills practice is a central component of the group-based cognitive-behavioral approaches with demonstrated efficacy for adolescent depression and aggression (Clarke, Rohde, Lewinsohn, Hops, & Seeley, 1999; Leeman, Gibbs, & Fuller, 1993).

Date SMART was evaluated in a small randomized controlled trial that followed adolescent girls for 9 months using partner-specific calendar methods and audio computer-assisted structured interviews to provide comprehensive DV and sexual risk assessment. We tested two primary hypotheses: 1) girls receiving the Date SMART intervention would show reductions in abuse perpetration and victimization as well as reductions in unprotected sex and sexual activity over time, relative to adolescent girls enrolled in a time and attention

matched Knowledge-only educational group, and 2) core target mechanisms (depression, self-regulation, interpersonal skills) would improve as a function of intervention.

Methods

Participants and Procedures

Participants were 109 adolescent females (ages 14-17) recruited from Providence, RI area high schools between 2009 and 2013 (Rizzo et al, 2017). Participants were enrolled in two phases. First, study staff distributed parental consent forms to complete a screening survey during school-based presentations in health and physical education classes. Students were compensated \$5 for returning the screening consent forms, regardless of their parent's decision regarding participation. During screening, adolescent girls completed selected subscales from the Conflict in Adolescent Dating Relationships Inventory - CADRI (Wolfe et al., 2001). Teens were deemed eligible if they endorsed a lifetime history of physical DV perpetration or victimization, were not actively engaged in another DV or HIV prevention program, and spoke English. In the second phase, eligible participants were contacted by phone and offered the opportunity to enroll in the study. Parental consent for study participation was obtained once the teen confirmed interest in participating and provided assent.

Teens with parental consent were randomized to either the Date SMART (DS) or Knowledge-only (KO) conditions. An urn randomization procedure was used to probabilistically balance the groups on two factors: presence of *severe* DV (defined as being kicked, hit, punched, or forced to have sex) and history of vaginal sex. Participants and their parents separately completed one baseline assessment, administered using audio computer-assisted structured interviews (ACASI) on laptop computers. Teen assessments also included a timeline follow-back interview with a trained research assistant to track DV and sexual behavior. Follow-up assessments with teens were completed at 3, 6, and 9-months post treatment. Teens were paid up to \$100 for completing assessments according to the following schedule: \$20 for baseline, \$25 for the 3-month, \$25 for the 6-month, and \$30 for the 9-month follow-up. Parents received \$20 for completing their assessment at baseline. Teens were provided transportation to and from group sessions, which took place at our research center.

In total, the KO group included 50 participants ($M_{age} = 14.90$) and the DS group included 59 participants ($M_{age} = 14.86$). Self-reported ethnicity and race among the KO group was 53% Hispanic; 33% African American, 25% White, 6% American Indian, and 6% Asian. Ethnicity and race among the DS group was 48% Hispanic; 37% African American, 20% White, and 10% American Indian; participants were able to endorse multiple options for race and ethnicity. Regarding family structure, 98% and 71% reported having a mother figure and father figure at home, respectively, in the KO group. Similarly, 95% and 53% reported having a mother and father figure at home, respectively, in the DS group. Finally, participants reported on their eligibility for free or reduced-price school lunch, which was examined as a measure of socioeconomic status; 80% and 82% of the KO and DS groups, respectively, reported that they currently qualified for free or reduced-price lunch. This study was approved by the affiliated hospital Institutional Review Board.

Intervention

Date SMART group—Adolescents enrolled in Date SMART participated in six weekly group sessions (two hours each), followed by one booster session six weeks after completing the active phase. The intervention focused on providing a toolkit of skills that arm teens with choices for how to handle situations involving risk including mutual aggression and unprotected sex. Skills included self-assessment, cognitive restructuring, problem solving, assertive communication training, self-soothing, and emotion regulation strategies targeted to anger, jealousy and sadness. The intervention also included discussion about partner selection and relationship values. Each session is designed to review members' skill acquisition since the previous session, to provide new information and skills (which were rehearsed), and to set new goals for implementation prior to the next session. Date SMART module content and facilitator training was trauma-informed. Participants received skills based modules for managing thoughts and feelings early so they would have the opportunity to utilize these skills if they were to experience reactions to sensitive material, such as condom demonstrations, later in the program. In addition, facilitators were trained in how to recognize and properly handle trauma-related content and reactions in a sensitive manner.

Knowledge-only group—The Knowledge-only (KO) group was developed for this study to provide interactive games and activities that cover common prevention topics discussed in health class. The DV and sexual health content did not include references to skill development, but did aim to increase knowledge regarding DV and sexually transmitted infections, as well as shift attitudes. The format of the KO condition was the same as the Date SMART condition. Table 1 provides an outline of the primary content areas for both groups.

Group facilitators included pre- and post-doctoral psychology trainees ($n = 4$) as well as social workers and licensed mental health counselors ($n = 4$) chosen based on their experience with counseling youth. Facilitators participated in an eight-hour training seminar over two days in which they practiced the intervention using role-play, discussed group management strategies, and reviewed best practices for addressing safety concerns including deteriorating mental health, life-threatening DV, suicidality, child abuse reports and trauma symptoms. Facilitators were trained in only one intervention condition to prevent contamination.

Intervention Fidelity

Intervention fidelity was achieved through the use of intervention manuals with detailed session scripts. Feedback was also provided to group facilitators in weekly supervision meetings. To ensure proper implementation of the cognitive-behavioral skills in the Date SMART arm, sessions were audio taped and twenty percent of sessions, selected randomly, were reviewed for adherence to protocol on a weekly basis; 94% of session modules were rated as adherent to the intervention manual. The KO comparison group was not monitored for fidelity; however, facilitators did participate in a weekly supervision to discuss group management issues.

Measures

Dating violence and sexual behavior—For all romantic partner surveys, the term ‘partner’ was defined broadly as “a boyfriend/girlfriend, sexual partner, or someone you are going out with. You could be committed to this person (dating only them) or you could be in an open relationship where you are dating other people.”

Conflict in Adolescent Dating Relationships Inventory: The CADRI (Wolfe et al., 2001) is a 35-item measure completed by teens in reference to actual conflict or disagreement with a current or recent dating partner. Each question is asked twice, first in relation to perpetration and second in relation to victimization. For the baseline assessment, participants were asked about the prevalence of DV over their lifetime and the past three months. For all other time points, the past three months were assessed. Consistent with prior work, we report on CADRI subscale scores using an involvement model where by victimization and perpetration are examined together as they frequently co-occur during this developmental period (Collibee & Furman, 2016; Whitaker, Haileyesus, Swahn, & Saltzman, 2007; Williams, Connolly, Pepler, Craig, & Laporte, 2008). In the current study, perpetration and victimization experiences for all forms of DV were correlated (Pearson $r_s = .20 - .67$, all $p_s < .10$), suggesting mutual aggression.

Social Networking and Controlling Behaviors Survey (developed for this study): Six items assess cyber dating abuse perpetration and victimization including: “has a dating partner asked for a personal password to a social networking site,” “have you checked up on a partner using a social networking profile,” “have you become jealous after reading social networking profile.” Internal consistency in the present sample was excellent (Cronbach's $\alpha = .83$ for victimization and $\alpha = .76$ for perpetration). As with the CADRI, perpetration and victimization scores were examined together as a measure of digital abuse involvement.

Timeline Follow Back-Dating Violence: The TLFB-DV is a semi-structured calendar-based interview method for assessing recent relationship violence. Calendar based methods are known to assist with recall and enhance accuracy when collecting behavioral data (Vendetti, Stappenbeck, & Fals-Stewart, 2004). The interview was adapted for this project based on the TLFB-Spousal Violence version developed by Fals-Stewart and colleagues (2003). The TLFB-DV was administered by a trained research staff member. Participants were asked to retrospectively describe their recent DV and sex history over the past 90 days. The authors reported excellent test-retest reliability (intraclass correlations 0.91–1.0) and evidence for both concurrent and discriminant validity (Fals-Stewart et al., 2003).

For the current study, each partner was coded by their initials so that the exact number of days with that partner could be summed. In addition, specific incidents of physical DV (hit, slapped, punched), vaginal sex and condom use by partner were gathered. These data were utilized to generate cumulative behavioral counts.

Intervention Mechanisms

The Beck Depression Inventory – II (Beck, Steer, & Brown, 1996)—The BDI-II is a 27-item self-report instrument intended to assess the existence and severity of symptoms of

depression during the most severe lifetime episode, according to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders Fourth Edition – DSM-IV(2000). In the present sample the BDI-II had excellent internal consistency (Cronbach's $\alpha = .88$) and validity.

Regulation of Emotion Questionnaire (Phillips & Power, 2007)—This measure assesses the frequency with which adolescents use functional and dysfunctional strategies of emotion regulation, arising internally (“I hurt myself somehow”) and externally (“I release my feelings on others by insulting them, yelling, arguing”). The REQ can be divided into four sub-scales: ‘internal-functional’, ‘internal-dysfunctional’, ‘external-functional’ and ‘external-dysfunctional’ emotion regulation. For the current study, internal and external strategies were examined together, as we did not hypothesize differences based on whether strategies arose internally or externally. The internal consistency for the functional and dysfunctional scales in the present sample were excellent (Cronbach's α range .69 - .80).

Partner-Related Condom Self-Efficacy—This 13-item measure was derived from a longer scale of condom self-efficacy attitudes and has been used in previous HIV prevention projects (Brown, Lourie, Zlotnick, & Cohn, 2000; Lescano, 2007). Participants rated how sure they were that they could use a condom in each situation on a scale from 1 (very sure) to 4 (couldn't do it). A mean score was computed for each participant by averaging across items. Internal consistency in the present sample was excellent (Cronbach's $\alpha = .93$).

Acceptance of Couple Violence Questionnaire (ACV; Foshee et al., 1998)—The ACV assesses beliefs and attitudes about couple violence among adolescents and has been validated in longitudinal studies of adolescent DV behavior. Participants rate how much they agree with a series of statements about DV on a scale from 1 (strongly disagree) to 4 (strongly agree). A mean ACV score was computed for each participant by averaging across the 11 items. Internal consistency for this scale in the present sample was excellent (Cronbach's $\alpha = .90$).

HIV Knowledge (Brown, DiClemente, & Beausoleil, 1992)—This scale was developed to assess adolescents' knowledge about HIV and AIDS using 23 true/false items. A total HIV knowledge score was computed for each participant by summing the number of correct items. Higher scores indicate greater HIV knowledge. Internal consistency for the HIV knowledge scale in this sample was acceptable (Cronbach's $\alpha = .71$).

Groupsession rating—After each group session, participants in both intervention arms (DS and KO) completed a Group Session Rating form developed for this study. Participants were asked to rate the helpfulness of the group session on a 5-point likert scale (1=not at all helpful; 5=extremely helpful) and could include written comments.

Analytic Approach

Treatment Imbalance

Despite randomization, there were significant baseline differences on sexual DV involvement and digital DV involvement whereby girls randomized to the DS intervention

had higher scores than those randomized to the KO intervention. Imbalance between conditions was addressed using inverse probability of treatment weights for all analyses. Weights were generated using the generalized boosted regression routine implemented in the R package *twang v1.4-9.5* (McCaffrey, Ridgeway & Morral, 2004). Weights were stabilized by dividing the baseline probability of being assigned a treatment by the model estimated probability estimated by the boosted regression. Stabilized weights have been shown to improve performance in smaller samples (Thoemmes & Ong, 2016).

Missing Data

Missing data ranged from 1% to 15% at baseline, 17% to 21% at 3-months, and 9% to 17% at 9-months; with 79% completing all assessments (99% completing at least 1 follow-up). Higher rates of missing data at any given assessment were due to the TLFB interview, which some participants were unable to complete during their follow-up session. Bias due to missing values was addressed using multiple imputations with imputations generated through chained equations – MICE (Van Buuren & Groothuis-Oudshoorn, 2011). The MICE algorithm was selected to include variables with different probability distributions (e.g., normal, negative binomial, binomial) in the imputation model. We generated 50 imputed datasets using the random forest routine implemented in the R package *mice v2.25*. The results from all imputed datasets were pooled using Rubin's rules (1987). The missing data algorithm included data for each time point from the measures reported here, as well as those reported in Rizzo et al., (2017).

Treatment Estimates

Generalized linear models were used for all analyses using Mplus 7.3. For the purposes of the current study, we are reporting results from the 3-month follow-up (immediately post-intervention) and the 9-month follow-up (final assessment point). However, the same pattern of results were obtained for the 6-month follow-up and are available upon request from the corresponding author. Each model included treatment group, assessment coded categorically with baseline as the reference, and the interaction between treatment and assessment. This model allowed for comparisons between groups as well as within treatment comparisons from baseline to the assessment of interest. Models were estimated using maximum likelihood with robust standard errors that accounted for non-normality in some of the DV outcomes and non-independence due to nesting of assessment within participant (i.e., MLR and TYPE=COMPLEX; Muthén&Muthén, 1998). For behavioral counts, the negative binomial distribution was used to help address zero-inflation; we also tested zero-altered models (zero-inflated Poisson, zero-inflated negative-binomial, hurdle models) with no change in the substantive conclusions and thus report results from the more parsimonious negative-binomial models. Effect sizes were estimated using standardized difference scores for continuous outcomes and rate ratios for behavioral counts (i.e., number of relationships, number of total sex acts, number of condomless sex acts, number of violent acts).

Behavioral Counts

Data from the TLFB-DV were used to calculate cumulative measures across the 9-months of follow-up. For all measures, data was summed across assessments. To account for missing assessments the cumulative measure was set to missing if any of the previous assessments

were missing. Cross-sectional counts as well as the cumulative measures were included in the imputation model described above to address the missing values. In addition, the average amount of time participants reported spending with their partner on a daily basis was averaged across partners and across the follow-up period.

Results

The average age of participants at baseline was 15.75 years ($SD = .94$). Self-reported ethnicity and race among the sample was 50% Hispanic; 35% African American, 22% White, 8% American Indian, and 3% Asian; participants were able to endorse multiple options for race and ethnicity. Regarding family structure, 96% reported having a mother figure at home and 62% reported having a father figure at home. Participants reported on their eligibility for free or reduced-price school lunch, which was examined as a measure of socioeconomic status; 81% reported that they currently qualified for free or reduced-price lunch. Further descriptive statistics regarding the study sample can be found in Rizzo et al., 2017.

Intervention Acceptability and Participant Satisfaction

There was a high degree of acceptance of the intervention by adolescent girls as demonstrated by our high rates of enrollment and attendance (see Figure 1). Of the youth who were eligible to participate in the study, 76% completed the baseline assessment and were randomized to group. Session attendance across intervention groups was excellent. Out of a possible 6 core sessions, participants attended an average of 5.08 sessions (range 1 - 6). In addition, 77% ($n = 84$) also attended the booster sessions that took place 6 weeks post intervention. There were no significant differences in attendance based on intervention condition (DS or KO) suggesting that both interventions were deemed acceptable to the participants. Furthermore, Group Session Rating forms indicated that the majority of participants rated the group sessions as extremely helpful, $M_s = 4.00-4.44$ ($SD_s = .29-.50$). Session ratings did not differ based on condition.

Mechanisms

Unadjusted means for both the KO and DS groups at baseline, three-month, and nine-month follow-up are presented in Table 2. Further, adjusted effect sizes for both within-group comparisons to baseline, and between-group comparisons with KO as the reference, are also presented in Table 2. Consistent with hypotheses, the within-group analyses indicated that the DS group showed small-to-medium sized improvements on important mechanism, with significant improvements in HIV knowledge, attitudes toward couples' violence, depressive symptoms, dysfunctional emotion regulation, and condom self-efficacy. The KO group also showed expected small-to-medium sized improvements in HIV knowledge and attitudes toward couples' violence. Unexpectedly, the KO group also showed medium sized improvements in depressive symptoms. Contrary to hypotheses, there were not significant differences between groups on any of the mechanisms of change.

Dating Violence

Unadjusted means for both KO and DS at baseline and nine-month follow-ups are presented in Table 3. The pattern of Effect Size estimates for the primary outcomes at the 3- and 6-month follow-ups are largely consistent with the 9-month findings (KO range .16-.37 and DS range .17-.55), thus we have focused on the 9-month outcomes as the most conservative estimate of intervention impact.

Consistent with hypotheses, the DS group reported significant decreases in all types of DV, with effect sizes ranging from -0.28 to -0.67. The KO group, in contrast, reported significant decline in only some DV behaviors, with effect sizes ranging from -0.12 to -0.48. There was a small group differences for Digital Abuse, although contrary to expectations it was not statistically significant. Consistent with expectations, there was a significant medium size between group difference for sexual DV.

Cumulative Timeline Follow-back (TLFB) Outcomes

Unadjusted means and adjusted effect sizes for cumulative behavioral counts of number of relationships, sexual behaviors, as well as time in relationships are listed in Table 3. Results indicate a significant decrease in the number of partners from baseline in both the KO and DS groups. However, only the DS group demonstrated a significant decline in both the number of total sex acts and well as number of violent acts. There were no significant between-group effects on the cumulative behavioral count measures.

Discussion

The vast majority of existing prevention programs for adolescent dating violence are school-based universal interventions that are not designed to target the gender-specific needs of affected youth. Further, they also fail to incorporate skills-based strategies to address the co-occurrence of sexual risk behaviors. Date SMART was designed to specifically target theoretically defined mechanisms linked with these experiences. Findings indicate that the Date SMART intervention was effective in promoting significant reductions in sexual dating violence exposure among our sample of high-risk adolescent girls. This finding is important as it suggests that intervention components unique to the Date SMART intervention, including the provision of behavioral skills in the context of partner conflict and sexual decision making, may be critical for addressing sexual DV among high-risk adolescent females.

Contrary to expectations, participants randomized to the KO comparison condition demonstrated reductions in many DV outcomes. Furthermore, although participants in the Date SMART condition showed improvements in condom use self-efficacy as well as reductions in violent acts and total sex acts using cumulative behavioral counts, between-group effect sizes were not significant. A number of factors may have contributed to our observations of behavior change across conditions. First, we developed both conditions to be gender-informed by integrating research on target mechanisms that are specific to adolescent females. Second, both conditions focused on DV involvement as a mutual process. Our focus on dyadic factors may have resonated with study participants and is consistent with

research on the mutual nature of adolescent dating aggression. Finally, both conditions were run as small-groups of peers with a history of DV exposure. Qualitatively, participants appeared to enjoy the peer support and appeared to learn from the experiences of the other participants. These group processes may be an important component for addressing DV in this population. Indeed, many empirical studies have found that perceptions of social support are significantly negatively correlated with depressive symptoms (Grav, Hellzèn, Romild, & Stordal, 2011). Furthermore, females with a history of partner violence are more likely to recover emotionally if a social support network is present (Eby, Campbell, Sullivan, & Davidson, 1995).

The overlapping content and non-specific benefits observed in both of our group-based interventions (DS and KO) limit our ability to draw conclusions about whether the pre-post reductions in DV and sexual risk behaviors observed are attributable to the intervention activities or the passage of time. To draw firm conclusions about the efficacy of Date SMART, future research comparing Date SMART to an inactive control condition is needed. Moreover, additional studies could also help to unravel how and for whom the Date SMART intervention may work. For example, what is the appropriate “dosage” to achieve maximum prevention effects and which participants receive the greatest benefit.

The unexpected findings for the KO condition are a limitation in the current study. However, their presence does offer some preliminary support for the validity of our theoretical framework. The KO condition reported decreases in DV as well as decreases in depressive symptomatology, reinforcing the link between depression and DV and suggesting that depression may be a critical target mechanism in reducing DV involvement. These findings are consistent with other studies that have identified bidirectional links between DV and depression (Johnson, Giordano, Longmore, & Manning, 2014) and support the role of depression in both DV victimization and perpetration. Thus, depression is an ideal target for prevention programming aimed at reducing mutual violence.

Limitations

One significant limitation in the current study is the lack of a passive control. That is, the KO condition was originally intended to be knowledge only; however, because the group facilitators were all trained clinicians and many of the topics discussed were similar across arms, the KO arm became an active therapeutic group that unintentionally provided therapeutic processing and social support. Consequently, only one between-group effect was found and causal inferences are limited. Further, although we attempted to balance groups through urn randomization, the small sample size led to significant group imbalance on primary outcomes. We attempted to account for this imbalance using propensity scores, but this statistical correction could not completely address the group differences. Given that youth randomized to the DS group presented at baseline with a more “severe” profile than their KO group counterparts, it can be argued that these participant scores were also more likely regress toward the mean. However, scores for these participants dropped consistently below baseline levels at all timepoints and thus our findings are unlikely to be due to chance. Additionally, given our short nine-month follow up period, we were not able to observe whether the cognitive behavioral skills provided in the DS group led to a more sustained

intervention effect when compared to the shifts in social support, knowledge and attitudes observed in the KO group. Finally, a large-scale trial with a longer follow-up would help determine if participants in the skills-based Date SMART group are more likely to sustain intervention effects over time and allow us to explore the longitudinal interplay of sexual risk behavior and DV.

Despite the limitations, there are a number of important findings to consider. First, our study demonstrated the feasibility of developing and implementing a CBT-based group intervention for girls with histories of physical DV that successfully targeted both DV and sexual risk behavior. These two domains are not easily addressed in one brief intervention, but our findings are clear that participants eagerly accepted the content and responded positively to session activities. Recruitment, enrollment, attendance and retention were excellent, especially for an intervention targeting a high-risk sample of adolescents. The engaging nature of our intervention modules which covered topics that participants rated positively, as well as our decision to provide transportation to group likely contributed to our excellent attendance rates. Conducting follow-up assessments in the participants' homes helped to achieve high retention rates. Second, although the small sample size of this pilot trial decreased the power available to detect significant behavioral change, our DS groups evidenced clinically meaningful change on all targeted behaviors. Additionally, the KO groups also revealed significant behavioral shifts. This pattern suggests that we successfully developed two active interventions with the most comprehensive intervention effects observed in the Date SMART group.

Finally, our observation of a significant between-group difference in sexual DV involvement over the follow-up period supports the utility of Date SMART in addressing this serious form of DV among high-risk adolescents. Such a finding highlights an important clinical and theoretical implication: the development of behavioral skills in the context of partner conflict *and* sexual decision making, may be critical for reducing sexual DV among high-risk adolescent females. Given that between-group differences in sexual DV emerged in the context of a highly active comparison group, it is reasonable to conclude that the specific, skills-based components addressing perpetration and victimization within dating and sexual risk contexts were vital for affecting change in this select group of adolescent females.

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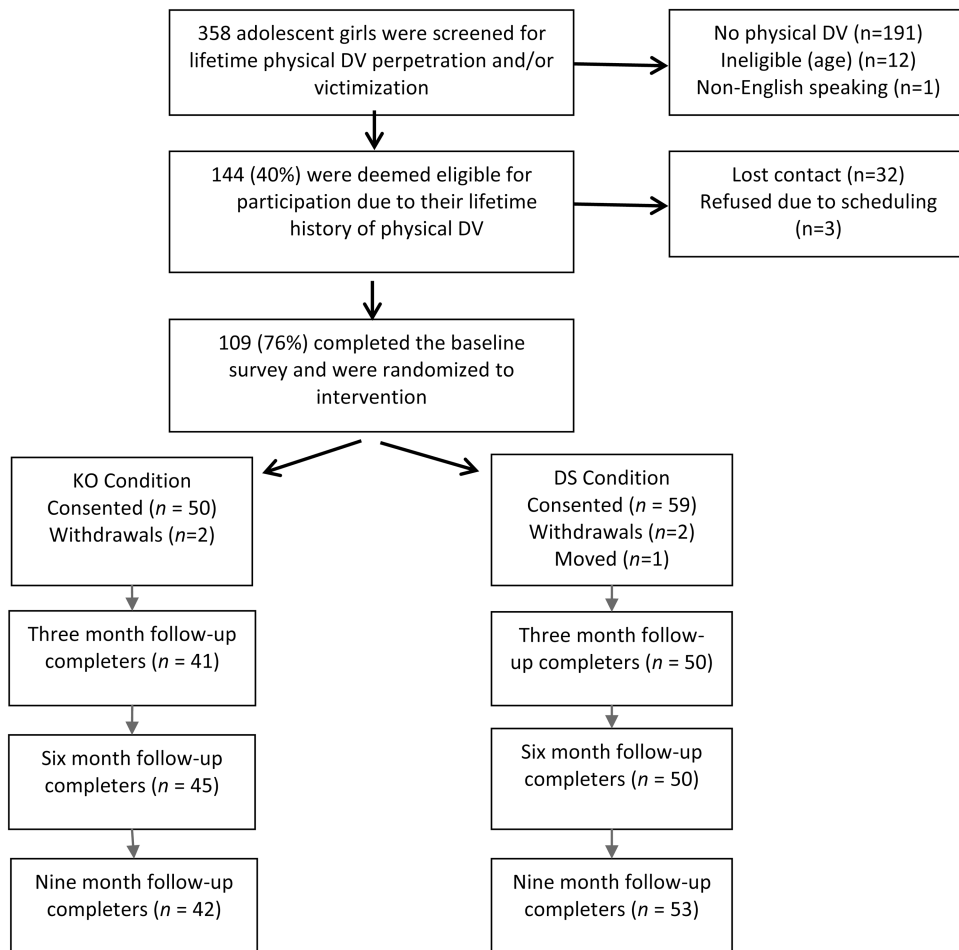


Figure 1. Participant consent, randomization, and retention (CONSORT flowchart) for Project Date SMART (Skills to Manage Aggression in Relationships for Teens).

Table 1
Intervention Modules

	Date SMART	Knowledge Only
Session 1	<ul style="list-style-type: none"> • Healthy v. Unhealthy Relationships(brainstorm) • Dating Violence Behaviors • HIV/STD Facts (part 1) • Thoughts→Feelings→Behaviors • SMART Problem Solving 	<ul style="list-style-type: none"> • Healthy v. Unhealthy Relationships (list) • Dating Violence Behaviors • HIV/STD Facts (part 1) • Identifying Relationship Role Models
Session 2	<ul style="list-style-type: none"> • Dating Violence Safety Planning (brainstorm) • Self-Checks • Cognitive Restructuring/Thinking Errors 	<ul style="list-style-type: none"> • Dating Violence Safety Planning (list) • Dating Violence in the Media • Gender Roles
Session 3	<ul style="list-style-type: none"> • Affect Management (ANGER and JEALOUSY) • Emotional Thermometer • Identifying and Avoiding Triggers • Opposite Action (Part 1) • Mindfulness and Self-soothing (part 1) 	<ul style="list-style-type: none"> • Identifying Peer and Relational Aggression • Cyber bullying • Online Safety • Alcohol Facts
Session 4	<ul style="list-style-type: none"> • Affect Management (DEPRESSION) • Changing Unhealthy Thoughts • Opposite Action (Part 2) • Mindfulness and Self-soothing (Part 2) • Evaluating Relationships/Partner Selection • Communication Skills (Part 1) 	<ul style="list-style-type: none"> • Mental Health Symptoms and Disorders • Marijuana Facts • Facts and Risks of Other Drugs
Session 5	<ul style="list-style-type: none"> • Communication Skills (Part 2) • Sexual Communication • Condom Skills/Practice • Identifying Sexual Values 	<ul style="list-style-type: none"> • Body Image • HIV/STDs (part 2) • Condom Steps (handout)
Session 6	<ul style="list-style-type: none"> • HIV/STD Testing • Social Support • Personalized Skills Plan • Relationship Values Discussion 	<ul style="list-style-type: none"> • HIV/STD Testing • Family of Origin • Handling Violence at Home • Role Models
Booster/Review	<ul style="list-style-type: none"> • Skills Review • Values/Integrity/Empowerment 	<ul style="list-style-type: none"> • Facts Review • Role Models

Table 2
Unadjusted means and adjusted effect sizes for mechanisms at baseline, 3 months, and 9 months Mechanism

	KO		DS		Between Condition Effect Size [95% CI]
	Unadjusted Means	d [95% CI]	Unadjusted Means	d [95% CI]	
Functional Emotion Regulation	Baseline	2.84 (0.78)	--	2.70 (0.84)	--
	3-month	2.71 (0.85)	-0.07 [-0.23; 0.08]	2.87 (1.03)	0.06 [-0.05; 0.18]
	9-months	2.89 (0.98)	-0.00 [-0.13; 0.13]	2.73 (0.93)	0.04 [-0.08; 0.15]
Dysfunctional Emotion Regulation	Baseline	1.98 (0.50)	--	1.98 (0.61)	--
	3-month	1.83 (0.62)	-0.14 [-0.28; 0.01]	1.67 (0.54)	-0.13 [-0.23; -0.02]
	9-months	1.77 (0.69)	-0.15 [-0.29; 0.01]	1.84 (0.75)	-0.1 [-0.27; 0.07]
Depression	Baseline	1.75 (0.47)	--	1.85 (0.59)	--
	3-month	1.34 (0.34)	-0.34 [-0.44; -0.24]	1.36 (0.45)	-0.39 [-0.50; -0.28]
	9-months	1.30 (0.55)	-0.35 [-0.48; -0.22]	1.48 (0.57)	-0.31 [-0.43; -0.19]
Condom Self-Efficacy	Baseline	1.90 (0.84)	--	1.84 (0.87)	--
	3-month	1.80 (0.94)	-0.04 [-0.20; 0.12]	1.65 (0.97)	-0.15 [-0.35; 0.05]
	9-months	1.70 (1.05)	-0.13 [-0.31; 0.05]	1.46 (0.80)	-0.27 [-0.47; -0.07]
Acceptance of Couples' Violence	Baseline	1.40 (0.40)	--	1.51 (0.57)	--
	3-month	1.34 (0.58)	-0.03 [-0.26; 0.19]	1.34 (0.57)	-0.18 [-0.32; -0.05]
	9-months	1.22 (0.35)	-0.17 [-0.28; -0.05]	1.18 (0.30)	-0.31 [-0.43; -0.20]
HIV Knowledge	Baseline	0.52 (0.16)	--	0.53 (0.15)	--
	3-month	0.7 (0.18)	0.46 [0.32; 0.61]	0.68 (0.18)	0.43 [0.3; 0.56]
	9-months	0.63 (0.20)	0.29 [0.15; 0.42]	0.65 (0.17)	0.34 [0.21; 0.47]

Note.

^aHigher scores indicate lower self-efficacy. Effect Sizes are standardized difference scores.

Bold=p <.05

Table 3

Unadjusted means and adjusted effect sizes for outcomes

	KO		DS		Between Condition Effect Size ^a [95% CI]		Effect Size ^a [95% CI]
	Baseline	9-month	Effect Size ^a [95% CI]	Baseline	9-month	9-month	
Continuous Outcomes							
CADRI-Threatening Behaviors	0.11 (0.24)	0.02 (.07)	-0.24 [-.48; .01]	0.17 (0.33)	0.04 (0.11)	-0.41 [-0.68; -0.14]	-0.17 [-0.53; 0.19]
CADRI-Physical Abuse	0.20 (0.40)	0.04 (0.12)	-0.36 [-0.67; -0.05]	0.17 (0.36)	0.03 (0.12)	-0.28 [-0.52; -0.05]	0.08 [-0.31; 0.46]
CADRI -Sexual Abuse	0.20 (0.47)	0.10 (0.20)	-0.12 [-0.40; 0.16]	0.27 (0.35)	0.04 (0.11)	-0.67 [-0.96; -0.37]	-0.55 [-0.95; -0.15]
CADRI-Emotional/ Verbal Abuse	0.67 (0.66)	0.28 (0.42)	-0.48 [-0.73; -0.22]	0.69 (0.64)	0.40 (0.52)	-0.46 [-0.70; -0.21]	0.02 [-0.33; 0.37]
Social Networking and Controlling Behaviors Survey	1.07 (0.97)	0.68 (0.89)	-0.31 [-0.55; -0.07]	1.56 (1.08)	0.95 (1.02)	-0.52 [-0.75; -0.28]	-0.20 [-0.54; 0.13]
Behavioral Counts ^b							
Number of dating relationships	0.28 (0.23)	0.09 (0.08)	0.30 [0.21; 0.41]	0.28 (0.24)	0.10 (0.10)	0.30 [0.22; 0.41]	1.02 [0.65; 1.60]
Number of total sex acts	0.89 (2.41)	0.48 (1.07)	0.58 [0.23; 1.49]	1.06 (2.33)	0.56 (1.11)	0.52 [0.27; 0.97]	0.89 [0.29; 2.73]
Number of condomless sex acts	0.39 (1.45)	0.18 (0.44)	0.42 [0.12; 1.44]	0.46 (1.65)	0.06 (0.10)	0.61 [0.18; 2.04]	1.47 [0.26; 8.21]
Number of violent acts	0.07 (0.23)	0.03 (0.12)	0.23 [0.05; 0.99]	0.16 (0.46)	0.03 (0.16)	0.16 [0.03; 0.87]	0.71 [0.08; 6.77]
Time Variables							
Total time in dating relationship(days/month)	12.02 (13.35)	6.96 (6.05)	-0.31 [-0.53; 0.09]	14.19 (16.26)	7.21 (6.26)	-0.45 [-0.71; -0.19]	-0.14 [0.19; -0.48]

Note.

^aEffect Sizes are rate ratios for behavioral counts and standardized difference scores for continuous outcomes and time variables.

^bBehavioral counts are shown as average of monthly rates.

Bold=*p*-value <.05