

Evaluating Teach One Reach One—An STI/HIV Risk-Reduction Intervention to Enhance Adult–Youth Communication About Sex and Reduce the Burden of HIV/STI

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Abstract

Purpose: Parents and caregivers play an important role in sexual socialization of youth, often serving as the primary source of information about sex. For African American rural youth who experience disparate rates of HIV/sexually transmitted infection, improving caregiver–youth communication about sexual topics may help to reduce risky behaviors. This study assessed the impact of an intervention to improve sexual topic communication.

Design: A Preintervention–postintervention, quasi-experimental, controlled, and community-based trial.

Setting: Intervention was in 2 rural North Carolina counties with comparison group in 3 adjacent counties.

Subjects: Participants (n = 249) were parents, caregivers, or parental figures for African American youth aged 10 to 14.

Intervention: Twelve-session curriculum for participating dyads.

Measures: Audio computer-assisted self-interview to assess changes at 9 months from baseline in communication about general and sensitive sex topics and overall communication about sex.

Analysis: Multivariable models were used to examine the differences between the changes in mean of scores for intervention and comparison groups.

Results: Statistically significant differences in changes in mean scores for communication about general sex topics ($P < .0001$), communication about sensitive sex topics ($P < .0001$), and overall communication about sex ($P < .0001$) existed. Differences in change in mean scores remained significant after adjusting baseline scores and other variables in the multivariate models.

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Conclusions: In Teach One Reach One intervention, adult participants reported improved communication about sex, an important element to support risk reduction among youth in high-prevalence areas.

Keywords

adult–youth communication about sex, risk-reduction intervention, community academic partnered research

Purpose

The risk of acquiring sexually transmitted infections (STIs) and HIV increases significantly between the adolescent and young adult years. The burden of infection is strongest for African Americans (AAs) in southern, rural areas of the United States.^{1,2} In North Carolina, for example, AAs in rural communities account for 65% of all HIV cases, 19% of whom are children and youth between the ages of 13 and 24.^{1,3} High rates of teen pregnancy, STIs, and sexual risk behaviors among youth have remained a source of concern for researchers, practitioners, and parents alike and are associated with behavioral, cultural, and biological factors.^{1,4,5}

Although many interventions have focused on reducing sexual risk behaviors among AA youth, a major critique of many of these programs is their tendency to focus on individual or proximal factors.^{6–9} Other risky and problematic behaviors (eg, teen dating violence, substance use, etc) tend to surface during the same developmental period as sexual risk behaviors.^{10,11} Due to the co-occurrence of risk behaviors as well as the overlap in ecological predictors during adolescence, multilevel interventions are needed to address co-occurring risk behaviors.^{10,11} Moreover, many interventions have been limited as a result of a sole focus on youth and failure to engage others within their social networks.¹² Others have been limited by a sole focus on caregivers, while failing to equally engage youth or engage parents and youth in dyads.^{13–14}

Parents and other caregivers, for example, play an important role in the sexual socialization of youth during early adolescence.^{15–20} As a result, including them in intervention efforts could increase the likelihood of positive outcomes, such as higher levels of family functioning, improved attitudes toward condom use, and informed beliefs about birth control.¹⁶

Researchers have been urged to develop intervention programs that not only engage youth but also engage others who influence the development of health behaviors in youth. Teach One Reach One (TORO), a multilevel risk-reduction program, used community-based participatory research (CBPR) methods to engage youth, parents, peers, and community members in intervention implementation. Teach One Reach One utilized a lay health advisor (LHA) model to reduce problem behaviors, such as sexual risk and teen dating violence, and increase healthy sexual, dating, and familial relationships among AAs in rural North Carolina. This multilevel approach provides a unique opportunity to examine intervention effects within a rural and resource-limited AA community. Therefore, the purpose of this study is to describe the effect of TORO on 1 of the intervention's primary aims, adult–youth communication about sex.

Methods

Design

We employed a preintervention–postintervention study design to conduct a quasi-experimental, controlled, community-based trial with a comparison group, to determine the impact of TORO on communication about sex. The study and all related procedures were approved by the institutional review board at the University of North Carolina at Chapel Hill (UNC).

Sample

The study took place in 5 rural counties in eastern North Carolina (see Table 1). Adult and youth in the intervention group were recruited from 2 rural counties, that is, Edgecombe and Nash, which surround 1 city. Although separated by county lines, the AA residents in these 2 counties function as 1 community because of shared social, cultural, and economic history. Most reside in a racially segregated area that spans the 2 counties with a railroad track that bisects the area. The counties have 94 000 (37%) and 53 000 (57%) AA residents, respectively.²⁰ We recruited participants in the comparison group from 3 adjacent counties, that is, Halifax, Northampton, and Wilson, with similar demographic profiles. These counties were part of another feasibility study to disseminate a 12-session diabetes prevention intervention, Power to Prevent (P2P), though we did not recruit directly from those P2P participants.²¹ This design allowed us to use a more rigorous study design with a comparison arm, with exposure to another intervention, to address an important health issue in the comparison communities, and to pragmatically address resource constraints. All 5 counties had higher rates of poverty and STIs compared with the state average, with the highest rates among AA residents.²²

Recruitment and informed consent. A research team comprised staff from UNC and partnering faith- or community-based organizations recruited participants, organized and facilitated sessions, and monitored the program's progress. We recruited participating dyads using a variety of strategies that were developed with our community partners. We recruited through local organizations, churches, schools, print media (eg, fliers, brochures, and newspaper), and via radio. Adult individuals, interested in participating were directed to call the study office. A study staff member would provide an overview of the study inclusion criteria, goals, and activities. In the intervention counties, we used a screening interview to determine eligibility.

Table 1. Demographic Characteristics of Intervention and Comparison Counties in 2006.

County	African Americans in County (%)	Percentage of African Americans in Poverty	Whites in County (%)	Percentage of Whites in Poverty	HIV Cases		Chlamydia Cases		Gonorrhea Cases	
					African Americans (%)	Whites (%)	African Americans (%)	Whites (%)	African Americans (%)	Whites (%)
Intervention										
Edgecombe	58	27	40	9	86	11	92	5	92	6
Nash	34	23	62	7	82	11	84	9	86	12
Control										
Halifax	53	34	43	11	85	14	85	11	87	8
Northampton	59	29	39	9	89	8	92	6	92	6
Wilson	39	30	40	9	90	8	72	12	81	5

During an earlier planning grant, academic and community partners developed a list of characteristics to be considered in the selection of LHAs.²³ Recruitment staff used this list to assess individuals. Adults who were interested and eligible were asked to sign a consent form for themselves and their youth. Youth were asked to sign an assent form. The same recruitment protocol was used to identify youth and adult dyads in the comparison counties.

Eligibility. To be eligible to participate, youth had to self-identify as AA, participate voluntarily, and be between 10 and 14 years of age at recruitment. Youth in early adolescence were targeted because the average age of sexual debut is 13 years in AA youth of this region.^{20,24} Adults had to be over age 18 years and the parent, primary caregiver, or parental figure for a participating youth. In addition, each adult–youth dyad who was recruited into the intervention group had to identify at least 1 other dyad or more if possible, with whom they would engage during the intervention period and share information they learned during the training. The rationale was to not only train the trainer and teach back²⁵ but also reinforce the training and importance of communication about sex and risk behaviors among individuals who were not study participants.

Intervention

Intervention theoretical framework and design. Our study was principally driven by a CBPR approach and guided by intervention mapping (IM). The IM encourages an optimal level of participation of all partners in the planning process, it acknowledges the impact of socioecological factors on health outcomes, and it highlights the application of health behavior theory in program development.^{14,26,27} In addition to health behavior theory, TORO incorporates constructs from the theory of planned behavior to address individual-level factors and social cognitive theory to address the influences of the social environment that influence sexual risk behaviors among AA youth.^{11,27} In addition to parental influence, we have also targeted *sexual norms*. Multiple studies have shown that adolescents who perceived their peers have engaged in sexual behavior are more likely to also engage in sexual behavior, to have an earlier sexual debut, and to continue the sexual behavior and/or

intercourse.^{20,28–36} Existing research also indicates that adolescents who had peers and/or parents who held less favorable attitudes or views about engaging in sexual behavior were more likely to practice abstinence and delay sexual debut.^{20,21,35,37–39} While a broader range of behavioral, social, and physical environmental factors may influence HIV/STI risk, our conceptual model was grounded in theory, existing literature, and our assessment of community needs and assets, so the intervention addresses HIV/STI risk among rural AA youth.⁴⁰

Teach One Reach One was developed by the Project GRACE (Growing, Reaching, Advocating for Change and Empowerment) Consortium which is an academic–community collaboration between partners who share the common goal of eliminating health disparities in AA communities through CBPR approaches to partnership development and intervention design. The consortium involved a broad representation of community stakeholder organizations including but not limited to Area L AHEC, Edgecombe and Nash County Health Departments, Heritage Hospital, National Association for the Advancement of Colored People, Project Momentum Inc., Nash Health Care Systems, and so on (see Figure 1). Using CBPR principles, IM, and drawing on extensive qualitative feedback from community stakeholders across 2 counties of NC, we designed and implemented TORO to address multiple contributors of risk among AA youth in rural eastern North Carolina.^{20,41} The multiple contributors of risk included in the TORO intervention spanned behavioral (eg, age of sexual debut), social (eg, parental influences), and physical (eg, availability of drugs and alcohol) environmental factors (see Figure 2). Teach One Reach One is a multigenerational intervention consisting of a 12-session HIV/STI risk-reduction program that trains dyads of early adolescents and their adult counterparts (parent, caregiver, or primary parental figure) using social learning and cognitive behavioral approaches. Teach One Reach One includes 2 primary components: (1) a curriculum for youth on condom use, healthy dating relationships, and abstinence and (2) a curriculum for adults on parental monitoring and communication about sexual health and healthy dating (see Table 2).

The intervention is divided into a curriculum for youth and one for adults, which is implemented in 12 weekly 1.5-hour sessions including a welcome and an overview session and a

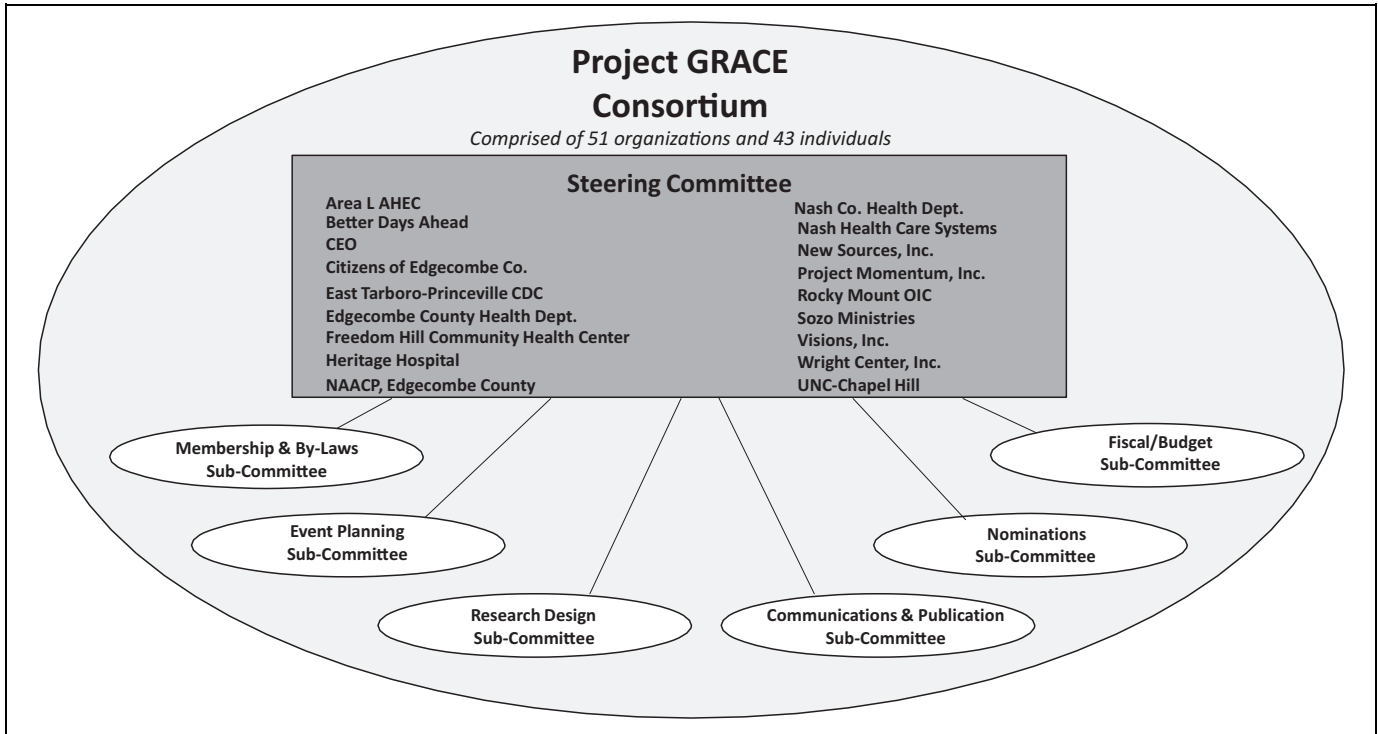


Figure 1. Project GRACE organizational structure. GRACE indicates Growing, Reaching, Advocating for Change and Empowerment.

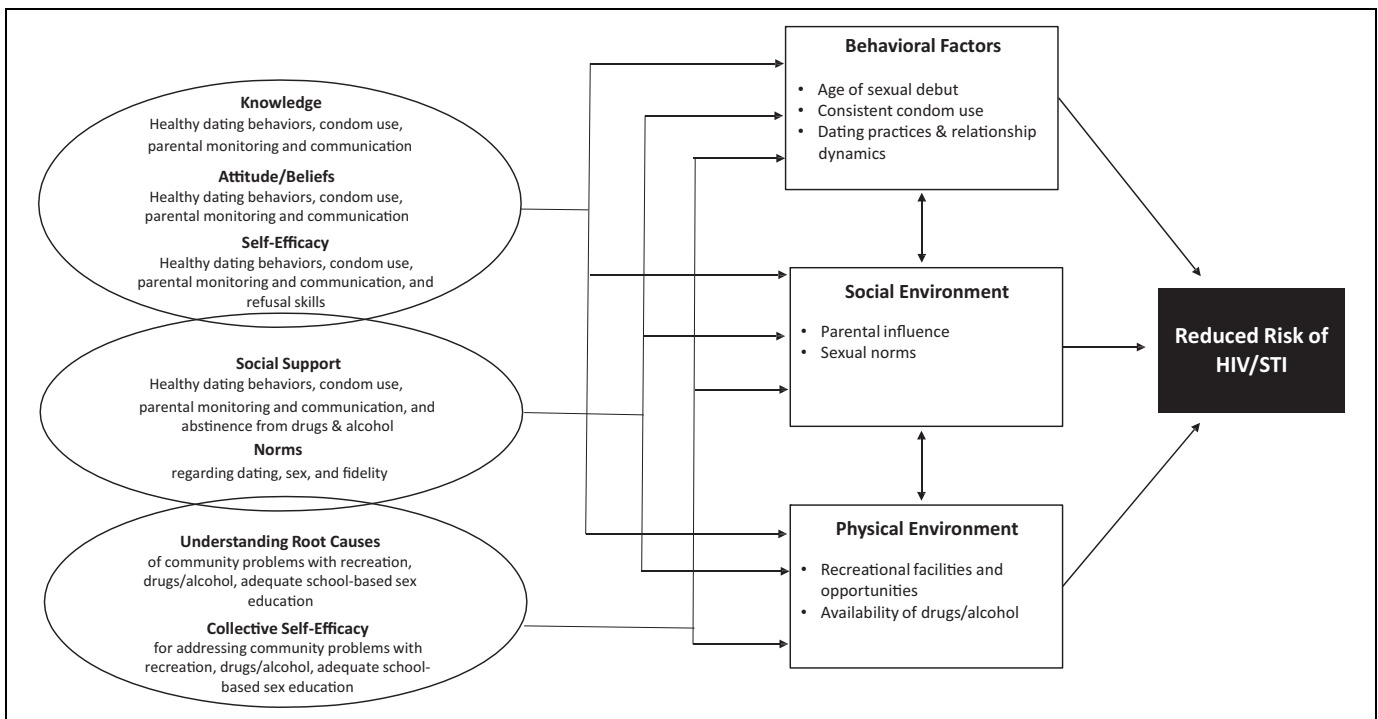


Figure 2. Teach One Reach One conceptual framework.

graduation ceremony. Whenever possible, we incorporated elements of other evidence-based interventions that included the outcomes or behavioral determinants we were addressing.^{14,40,41-43} Sessions were sequential, with later sessions

building on concepts of earlier ones, and emphasized active learning using a variety of strategies (eg, games, small and large group discussions, skill practice). The adult curriculum focused on parental monitoring and communication about sex

Table 2. TORO Intervention Sessions Overview.

Session	Caregiver Session	Youth Session
Session 1	Welcome session	Welcome session
Session 2	Family values and decision-making	Making plans for me
Session 3	Healthy relationships	Healthy relationships
Session 4	Setting healthy boundaries	Setting limits for yourself
Session 5	Rules, boundaries, and parental monitoring	Identifying and resisting pressure
Session 6	Preparing for “the big talk”	Your body—the facts
Session 7	Preparing for “the big talk”	HIV/STI facts
Session 8	Consequences of choosing abstinence of choosing to have sex	Examining the consequences of having sex as a teen
Session 9	Helping youth navigate	Resisting pressure
Session 10	Managing media	Using condoms
Session 11	Advising skills, part 1	Advising skills, part 1
Session 12	Advising skills, part 2	Advising skills, part 2
Session 13	Graduation	Graduation

Abbreviations: STI, sexually transmitted infection; TORO, Teach One Reach One.

and healthy dating. Each session was structured to target specific behavioral determinants from our guiding theoretical framework and included knowledge, attitudes, skills, self-efficacy, outcome expectations, social support/social networks, and perceived norms for youth and parents on abstinence, condom use, healthy dating, communication, and parental monitoring. The youth curriculum focused on abstinence, condom use, and healthy dating relationships.

Sessions were held on Saturday mornings. To keep the training sessions relatively small and allow for more interactive activities and individualized feedback, 5 to 10 dyads were trained in each wave. Adult and youth attended sessions separately for the first hour and then together for the last half hour. During the joint session, adults and youth had the opportunity to process what they learned and practice new skills. The dyadic activities included communication skills in pairs and groups. Some activities focused on communication, but other skills were also emphasized using innovative approaches to learning, for example, condom skills relay race or anatomy jeopardy. Participants received lunch and an incentive of US\$10 for participating in each session.

Data collection. To address potential low literacy in our participants and afford maximal privacy, we used audio computer-assisted self-interview (A-CASI) for data collection in both groups. The A-CASI has been shown to be more effective than face-to-face interviews or self-administered surveys to elicit valid self-reports of sexual activity. Outcome measures were assessed at baseline and 9 months. The posttest questionnaire assessed parent–teen communication in the last 6 months, thereby excluding intervention activities from the reported behaviors in the

posttest. Participants received a US\$30 incentive after completing each data collection session.

Measures

We assessed the effectiveness of TORO on communication about sex using the following primary and secondary outcomes.

Communication about sexual topics. Communication about sexual topics¹¹ (primary outcome) was assessed with 3 measures. First, we created an overall measure using a 20-item scale (Cronbach’s $\alpha = .94$) adapted from previously published instruments.¹¹ Because this scale was combined from multiple sources, we conducted exploratory factor analyses. Two subscales emerged: *Communication about General Sex Topics*, wherein items were scaled based on the following question—Please remember to think about how often you have talked with the youth in the program about these topics. The topics included menstruation, pregnancy, condom use, and so on. This subscale included 10 items (Cronbach’s $\alpha = .91$). Similarly, Subscales 2, *Communication about Sensitive Sexual Topics*, also assessed how often parents discussed these topics with their children and included items such as satisfaction (orgasm), masturbation, and wet dreams, and this subscale had 6 items (Cronbach’s $\alpha = .91$). We report results for all 3 measures because there is some overlap with item distribution between the subscales and the overall measure of communication about sex.

Knowledge of open communication. Knowledge of open communication (secondary outcome) was measured using a 4-item true/false scale.^{23,44} The scale was scored based on the number of items answered correctly. Example item, “A good way to open the door of communication is to watch TV or movies with your child and follow that with a discussion about the characters.”

Attitudes toward communication about sex topics. Attitudes toward communication about sexual topics (secondary outcome) was measured using a 10-item scale developed de novo to assess parental beliefs about discussing sex with youth in the study.^{45,46} For example, we assessed the level of agreement on, “Parents should talk to their child about dating” and “I am afraid to talk to my child about sex.” Item scores ranged from *strongly agree* to *strongly disagree*, and a composite score was developed by averaging individual items within the different groups. Higher scores indicate more favorable attitudes to talking to youth about sexual topics.

Self-efficacy of communication about sex topics. Self-efficacy of communication about sexual topics (secondary outcome) was measured using a 16-item scale (Cronbach’s $\alpha = .85$).^{11,44,45} Adults were asked to rate their confidence in explaining sexual questions such as “How to put on a condom” and “Why an unmarried person should use a condom when they have sex.”

The final value for this scale was computed by adding all items, which are scored on a range from 0 (*not sure at all*) to 3 (*completely sure*). Higher scores indicate greater self-efficacy.

Frequency of communication. Adult–youth communication was measured using the parent–adolescent community scale developed by Wingood and Diclemente (5 items),⁴⁷ that assessed the frequency of communicating about sexually related topics. The adults were asked, “In the past six months, how often have you and your parent(s) talked about the following things: (1) sex, (2) how to use condoms, (3) protecting yourself from STIs, (4) protecting yourself from the AIDS virus, and (5) protecting yourself from becoming pregnant.”

Demographic characteristics. We queried adult participants on the following demographic characteristics: gender, race, ethnicity, household income, educational attainment, marital status, employment, insurance status, and relation to enrolled youth.

Analysis

We used data collected at baseline and 9 months from the adults in the intervention and control groups. We calculated descriptive statistics (means, medians, proportions, and standard errors) to summarize baseline sample characteristics and used *t* tests and χ^2 tests to compare these characteristics between adults in the intervention and control groups. We used paired *t* tests to compare pre-post changes within groups and simple *t* tests for differences in the mean changes between the intervention and comparison groups for all study outcomes. Similarly, we compared the characteristics between those adults who dropped out and those retained in the study. In addition, we used multivariate regression models that included covariates that differed between the intervention and comparison groups (gender, marital status, duration of intervention, relation to the child, and age) along with the baseline value of the outcome variable of interest. All analyses were conducted using SAS 9.2.

Results

Demographic Characteristics

The average age of our adult sample was 36 years. Most were women (87%), non-Hispanic blacks (87%), and unemployed (63%), with an annual household income of less than US\$40,000 (73%) and educational attainment less than a college degree (83%; see Table 3). The majority of adult participants were either parents (63%) or relatives (21%) of youth in the study. There were statistically significant differences between the intervention and comparison groups on gender, race, marital status, relation to the child, and age. In addition, among intervention participants, more than half ($n = 67$, 61%) completed all of the TORO sessions and more than two-thirds of the sample ($n = 99$, 91%) completed at least 50%. Sixty-two youths participated in the intervention trial. Their mean age was 12.6 years,

half (50%) were female, and most (96.5%) self-identified as AA, with the remainder identifying as multiracial or from an unspecified background. In addition, the dyads who were trained were able to recruit more than 100 allies in the treatment ($n = 130$) and comparison ($n = 143$) groups.

Primary and Secondary Outcomes

Improvement in communication about general sex topics was greater in the intervention group ($P < .001$) versus the comparison group. The mean difference in the change in scores for the intervention group was significantly larger ($P < .001$) than the mean change in the comparison group and remained so after adjustment for baseline scores on communication about general sex topics and the variables that differed between the 2 groups ($P < .001$).

In addition, we saw improvements in communication about sensitive sex topics in the intervention group ($P < .001$) versus the comparison group. The mean difference in change of scores was statistically significantly larger for the intervention group compared to the comparison group ($P < .001$) and remained so after adjustment for baseline scores on communication about sensitive sex topics and the variables that differed between the 2 groups ($P < .05$).

There were statistically significant differences in the overall communication about sex. Overall scores improved in both, the intervention group ($P < .001$) and the comparison group. Here, too, the mean difference in the change in scores was significantly larger for the intervention group than for the comparison group ($P < .001$) and remained so after adjustment for baseline scores on overall communication about sex and the variables that differed between the 2 groups ($P < .001$).

No significant differences were noted in changes in mean score from baseline to postintervention between the intervention and comparison groups for knowledge of and attitudes toward communication about sexual topics. However, from baseline to postintervention, self-efficacy of communication about sexual topics improved in the intervention group ($P < .001$). The mean difference between baseline and postintervention scores was significantly larger for the intervention group than the comparison group ($P = .007$) and remained so after adjustment for baseline self-efficacy score and the variables that differed between the 2 groups ($P < .001$; see Table 4).

Finally, there were statistically significant differences in the overall frequencies of communication about sex. Frequency of communication between adults and youths about general topics increased ($P < .0001$, unadjusted) for the intervention group. This change remained significant after adjusting the mean change when compared to the control group mean change ($P < .05$). Similar findings were seen for change in the frequency of communication about sensitive topics at the end of TORO among the intervention group which remained significant after adjustment ($P < .05$).

Table 3. Demographic Characteristics of Adult TORO Participants and Comparison.

Personal Characteristics	Overall		Intervention		Comparison		P
	n	Est	n ^a	Est	n	Est	
Gender							
Male	55	22.09	12	13.04	43	27.39	.008
Female	194	77.91	80	86.96	114	72.61	
Race ^b							
African American	129	86.58	80	86.96	149	94.90	.026
Other/not reported	20	13.42	12	13.04	8	5.10	
Ethnicity							
Non-Hispanic/Latino	237	97.53	88	96.70	149	98.03	.520
Hispanic/Latino	6	2.47	3	3.30	3	1.97	
Income							
<US\$5000	56	24.78	20	25.64	36	24.32	.997
US\$5000-19 999	71	31.42	24	30.77	47	31.76	
US\$20 000-39 000	61	26.99	21	26.92	40	27.03	
US\$40 000 or more	38	16.81	13	16.67	25	16.89	
Education							
<HS diploma	51	20.56	18	19.57	33	21.15	.683
HS diploma to some college or technical school	148	59.68	58	63.04	90	57.69	
College degree or higher	49	19.76	16	17.39	33	21.15	
Marital status							
Married/cohabitating	81	32.79	35	38.04	46	29.68	.009
Separated/divorced/widowed	55	22.27	27	29.35	28	18.06	
Never married	111	44.94	30	32.61	81	52.26	
Employed for wages							
Yes	109	44.67	34	36.96	75	49.34	.059
No	135	55.33	58	63.04	77	50.66	
Relation to youth							
Parent	137	55.02	58	63.04	79	50.32	.015
Relative	45	18.07	19	20.65	26	16.56	
Friend/other	67	26.91	15	16.30	52	33.12	

Abbreviation: Est, estimate; HS, high school; TORO, Teach One Reach One.

^aTotals do not sum to the sample size due to missing data.

^b"Other/not reported" includes 1 adult participant from the comparison group who selected "American native."

Discussion

Findings from our study provide a glimpse of the multi-layered nature of parental communication about sex. The intervention group experienced statistically significant improvements over time in the overall communication about sex; more specifically, improvements in domains related to general sex topics (eg, menstrual cycle) and sensitive sex topics (ie, masturbation). These findings are consistent with the literature.⁴⁸⁻⁵¹ Teach One Reach One was also successful in enhancing the intervention group's self-efficacy in communicating about topics such as sexual risk taking, condom use, abstinence, and healthy dating behaviors. Many interventions that aim to increase adults' self-efficacy in communicating about sex with their child have illustrated similar effects.⁵⁰⁻⁵³ Both of the aforementioned findings are important because research has shown that parents, guardians, and caregivers are crucial in helping youth navigate through the risks and challenges related to sexuality⁵⁴; however, many well-meaning parents fail to effectively communicate with their youth about sex because of perceptions related to their

own discomfort, poor knowledge, and inadequate communication skills.⁵⁵ Therefore, interventions like TORO that aim to improve parents' communication about sex topics and their self-efficacy related to communication have the potential to reduce youth sexual risk behaviors.

Teach One Reach One intervention did not have an effect on parents' attitude toward communicating with their youth about sex. A reason for the null finding could be related to sex being a sensitive topic for most parents; therefore, parents discussing sex with their youth may be difficult and seem taboo. This particular finding may be the case for our sample of AA parents who reside in the southeast "Bible Belt" region of the United States and are more likely to be religious and have conservative values⁵⁶ that may conflict with openly discussing sex topics. Essentially, their beliefs and values may be the basis for the negative attitude about engaging in discussions related to sex with their youth. As illustrated in a systematic review of parent-child sex communication literature from 1980 to 2010, there is a dearth of literature on interventions that have explored parental attitudes toward communication. The review cited 1

Table 4. Unadjusted and Adjusted Difference in Mean Change in Communication Scores in Adult Participants in Intervention Versus Comparison Groups.

Outcomes of Interest	Baseline		Postintervention	Difference in Mean Changes in Scores			
	n ^a	X (SD)	X (SD)	Unadjusted	P	Adjusted ^b	P
Attitude toward communication							
Intervention	90	15.77 (3.18)	16.11 (3.05)	0.38	.466	0.42	.308
Comparison	149	15.27 (3.52)	15.23 (3.17)				
Knowledge communication							
Intervention	91	0.83 (0.77)	0.75 (0.64)	−0.10	.433	−0.11	.322
Comparison	152	0.86 (0.76)	0.88 (0.89)				
Self-efficacy of communication							
Intervention	84	39.12 (8.29)	43.37 (5.98)	3.28	.011	3.47	.001 ^c
Comparison	144	37.15 (10.61)	38.12 (10.04)				
Communication about general sex topics							
Intervention	86	16.85 (8.47)	22.14 (6.24)	5.24	<.0001	3.55	.0002 ^c
Comparison	143	17.94 (8.63)	17.98 (8.35)				
Communication about sensitive sex topics							
Intervention	85	5.52 (5.90)	10.32 (6.17)	4.27	<.0001	2.93	.0002 ^c
Comparison	138	7.61 (7.24)	8.15 (6.81)				
Overall communication about sex							
Intervention	85	27.49 (15.59)	39.44 (13.14)	11.02	<.0001	7.57	<.0001 ^c
Comparison	138	31.25 (17.26)	32.18 (15.96)				
Frequency of parent–teen communication about general sex topics							
Intervention	86	16.85 (8.47)	22.14 (6.24)	5.24	<.0001	3.56	.0002 ^c
Comparison	143	17.94 (8.63)	17.98 (8.35)				
Frequency of parent–teen communication about sensitive topics							
Intervention	85	5.01 (5.24)	9.21 (5.37)	3.64	<.0001	2.48	.0009 ^c
Comparison	138	6.89 (6.36)	7.46 (6.11)				

Abbreviations: X, mean; SD, standard deviation.

^aTotals do not sum to the sample size due to missing data.

^bModels control for variable scores for each outcome, respectively, and demographic (gender, marital status, duration of intervention, relation to the child, and age) variables.

^cSignificant at α level < .05.

intervention study published in 1985 that examined parental attitudes; however, the intervention did not improve parents' attitudes.⁵⁷ The paucity of research regarding attitudes toward communication suggest that we need to conduct more research on this construct as it may be a key barrier and facilitator to parents engaging in conversation with their youth about sex.

Teach One Reach One intervention did not have an effect on parents' knowledge regarding open communication (ie, displaying appropriate body language, engaging in active listening and effective ways to begin communication, and being nonjudgmental). This finding aligns with the null result related to parental attitudes because tenets of open communication may not resonate with or be perceived as essential for a parent who has a discouraging attitude toward communicating sex information. Nevertheless, it is important to educate parents about the fundamentals of open communication because research has shown that open and frequent communication about sex between parents and youth is linked to delayed sexual debut and increased use of contraceptives.⁵⁸ However, additional research is needed to understand if and how attitudes toward communication and knowledge of open communication are associated; this research will help refine our intervention

and increase the probability that parents will experience improvements in both constructs.

Limitations

As in all studies, our findings should be considered in the context of its limitations. Our measures of communication were self-report. Although consistent with current methods, there is always potential for recall and social desirability bias; even though we intentionally selected A-CASI as a data collection method to mitigate the potential bias. In addition, there were baseline differences in demographic characteristics, which we adjusted for in our multivariable models; however, there may be unmeasured and unequally distributed confounders for which we were unable to control in our analyses. In this community-based controlled study, it was not feasible to randomize or have blind participants in the intervention or comparison groups. However, the statistically significant large differences we found in the intervention group from baseline to posttest on multiple measures of communication suggest the findings are robust. We did not measure actual HIV/STI risk behaviors or examine the relationship between communication and actual HIV/STI risk behaviors. Therefore, we can only

hypothesize on TORO's overarching ability to reduce youth sexual risky behaviors. Future implementation of TORO can focus on investigating links between effective parent–youth communication about sex and actual HIV/STI risk behavior outcomes.

SO WHAT?

What is already known on this topic?

African American youths are 3 to 4 times more likely than other ethnic groups to begin sexual activity at an early age. Active and ongoing parental involvement in teen sexual development has been well-documented as positively influencing behaviors to reduce sexual risk.

What does this article add?

Teach One Reach One intervention was effective in improving adult–youth communication about general and sensitive sex topics, frequency, self-efficacy, and knowledge of open communication. Our findings underscore the complex and dynamic nature of parental communication and warrants further research to determine how various aspects of communication may be associated with decreasing risky sexual behaviors among youth.

What are the implications for health promotion practice or research?

Adolescence is characterized by increases in sexual interest, experimentation, and risk⁵⁹; therefore, open and effective adult–youth communication about sexual topics is necessary to facilitate healthy and appropriate sexual development and risk reduction.⁶⁰ Caregivers play a critical role in shaping the way in which youth develop and transition from adolescence to adulthood; they are in a unique position to communicate values, beliefs, expectations, and knowledge to youth.^{61,62} Our findings support the feasibility and utility of improving caregiver communication skills as a potential strategy to mitigate sexual risk among youth. In addition, our findings suggest that future research should aim to understand the relationship between attitudes toward communication and knowledge of open communication as a means to refine the TORO intervention and ensure parents engage in positive and open sex health communication with their youth.

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