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Evaluating Teach One Reach One – A 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/STI, 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—Quasi-experimental, pre/posttest, controlled, community-based trial

Setting—Intervention was in two rural NC counties with comparison group in three adjacent counties.

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

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 ($p<0.0001$), communication about sensitive sex topics ($p<0.0001$), overall communication about sex ($p<0.0001$) existed. Differences in change in mean scores remained significant after adjusting baseline scores and other variables in the multivariate models.

Conclusions—In TORO, adult participants reported improved communication about sex, an important element to support risk reduction among youth in high prevalence areas.

Key Words and Indexing Key Words

Adult youth communication about sex; risk reduction intervention; community academic partnered research

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 (US).^{1,2} In North Carolina (NC), 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 has remained a source of concern for researchers, practitioners, and parents alike and are associated with behavioral, cultural, and biological factors.^{1,4,5}

While 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 (e.g., 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.¹⁴

Parents and other caregivers, for example, play an important role in the sexual socialization of youth during early adolescence.^{18, 15, 16, 19, 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 towards 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. TORO 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 NC. This multi-level approach provides a unique opportunity to examine intervention effects within a rural and resource-limited AA community. Therefore, the purpose of the current study is to describe the effect of TORO on one of the intervention's primary aims, adult-youth communication about sex.

METHODS

Design

We employed a pre- post-intervention 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 five rural counties in eastern NC (see table 1). Adult and youth in the intervention group were recruited from two rural counties i.e. Edgecombe and Nash, which surround one city. Although separated by county lines, the AA residents in these two counties function as one community because of shared social, cultural, and economic history. Most reside in a racially segregated area that spans the two 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 three adjacent counties i.e. 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.²² 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 five counties had higher rates of poverty and STIs compared with the state average, with the highest rates among AA residents.²¹

Recruitment and Informed Consent—A research team comprised of 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 (e.g. fliers, brochures, 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. During an earlier planning grant, academic and community partners developed a list of characteristics to be considered in the selection of LHAs.²⁵ 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 in this region.^{20, 23} 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 that was

recruited into the intervention group had to identify at least one 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 to train the trainer and teach back,²⁴ but to 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 community-based participatory research (CBPR) approach and guided by Intervention Mapping (IM). IM encourages an optimal level of participation of all partners in the planning process; it acknowledges the impact of socio-ecological 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, 29–37} 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, 22, 36, 38–40} 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.²⁸

TORO was developed by the Project GRACE (Growing, Reaching, Advocating for Change and Empowerment) Consortium which is an academic-community collaboration between partners that 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, NAACP, Project Momentum Inc., Nash Health Care Systems, etc. (see figure 1). Using community-based participatory research (CBPR) principles, Intervention Mapping, and drawing on extensive qualitative feedback from community stakeholders across two counties of NC, we designed and implemented TORO to address multiple contributors to risk among AA youth in rural eastern NC.^{20, 41} The multiple contributors of risk included in the TORO intervention spanned behavioral (e.g., age of sexual debut), social (e.g., parental influences) and physical (e.g., availability of drugs and alcohol) environmental factors (see figure 2). TORO is a multi-generational 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. TORO includes two 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, implemented in twelve weekly 1.5-hour sessions including a welcome and overview session and a graduation ceremony. Whenever possible, we incorporated elements of other evidence-based interventions that included the outcomes or behavioral determinants we were addressing. 14, 28, 41–43 Sessions were sequential, with later sessions building on concepts of earlier ones, and emphasized active learning using a variety of strategies (e.g., games, small and large group discussions, skill practice). The adult curriculum focused on parental monitoring and communication about sex 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, 5–10 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 in groups. Some activities focused on communication but others skills were also emphasized using innovative approaches to learning e.g., condom skills relay race or anatomy jeopardy. Participants received lunch and an incentive of \$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. 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 six months, thereby excluding intervention activities from the reported behaviors in the posttest. Participants received a \$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 Topics¹¹—Communication about sexual topics (primary outcome) was assessed with three 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, etc. This sub-scale included 10 items (Cronbach's alpha = .91). Similarly, sub-scale 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, had 6 items (Cronbach's alpha = .91). We report results for all three 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.^{25, 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 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) created by DiIorio.^{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 (PACS) developed by Wingood and Diclemente (5 items),¹¹ 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 chi-square 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 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 \$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%. 62 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 that 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 ($p < 0.001$) versus the comparison group. The mean difference in the change in scores for the intervention group was significantly larger ($p < 0.001$) 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 two groups ($p < 0.001$).

In addition, we saw improvements in communication about sensitive sex topics in the intervention group ($p < 0.001$) versus the comparison group. The mean difference in change of scores was statistically significantly larger for the intervention group compared to the comparison group ($p < 0.001$) and remained so after adjustment for baseline scores on communication about sensitive sex topics and the variables that differed between the two groups ($p < 0.05$).

There were statistically significant differences in overall communication about sex. Overall scores improved in both, the intervention group ($p < 0.001$) 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 ($p < 0.001$) and remained so after adjustment for baseline scores on overall communication about sex and the variables that differed between the two groups ($p < 0.001$).

We noted no significant differences in changes in mean score from baseline to post-intervention between the intervention and comparison groups for knowledge of and attitudes towards communication about sexual topics. However, from baseline to post-intervention, self-efficacy of communication about sexual topics improved in the intervention group ($p < 0.001$). The mean difference between baseline and post-intervention scores was significantly larger for the intervention group than the comparison group ($p = 0.007$) and remained so after adjustment for baseline self-efficacy score and the variables that differed between the two groups ($p < 0.001$), (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 ($p < 0.05$). 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 ($p < 0.05$).

DISCUSSION

Findings from our study provide a glimpse of the multilayered nature of parental communication about sex. The intervention group experienced statistically significant improvements over time in overall communication about sex; more specifically, improvements in domains related to general sex topics (e.g. menstrual cycle) and sensitive sex topics (i.e. masturbation). These findings are consistent with the literature.^{47–50} TORO 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.^{49–52} Both of the aforementioned findings are important because research has shown that parents, guardians and caregivers are crucial to helping youth navigate risk and challenges related to sexuality;⁵³ 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.⁵⁴ 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.

The TORO 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 US and are more likely to be religious and have conservative values⁵⁵ 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 1980–2010, there is a dearth of literature on interventions that have explored parental attitudes toward communication. The review cited one intervention study published in 1985 that examined parental attitudes; however, the intervention did not improve parents’ attitudes.⁵⁶ 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.

The TORO intervention did not have an effect on parents’ knowledge regarding open communication (i.e., 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 towards 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.⁵⁷ 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 on 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. While 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 post-test on multiple measures of communication suggests 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.

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SO WHAT?

What is already known on this topic?

AA youths are three to four 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?

TORO 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 risk;⁵⁸ therefore, open and effective adult-youth communication about sexual topics is necessary to facilitate healthy and appropriate sexual development and risk reduction.⁵⁹ 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.^{60, 61} 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.

Figure 1.
 Project GRACE Organizational Structure

Figure 2.
TORO Conceptual Framework

Table 1

Demographic Characteristics of Intervention and Comparison Counties in 2006

County	African Americans in County	% African Americans in Poverty	Whites in County	% 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%		92%	6%
Nash	34%	23%	62%	7%	82%	11%	84%		86%	12%
Control										
Halifax	53%	34%	43%	11%	85%	14%	85%		87%	8%
Northampton	59%	29%	39%	9%	89%	8%	92%		92%	6%
Wilson	39%	30%	40%	9%	90%	8%	72%		81%	5%

Table 2

TORO Intervention Sessions Overview

Session	Caregiver Session	Youth Session
Session 1	Welcome Session	Welcome Session
Session 2	Family Values & 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, & Parental Monitoring	Identifying & 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

Table 3
Demographic Characteristics of Adult Teach One Reach One (TORO) Participants and Comparison

Personal Characteristics	Overall		Intervention		Comparison	
	n	Est.	n ^a	Est.	n	Est. p
Gender						
Male	55	22.09	12	13.04	43	27.39 0.008
Female	194	77.91	80	86.96	114	72.61
Race^b						
African American	129	86.58	80	86.96	149	94.90 0.026
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 0.520
Hispanic/Latino	6	2.47	3	3.30	3	1.97
Income						
< \$5,000	56	24.78	20	25.64	36	24.32 0.997
\$5,000–19,999	71	31.42	24	30.77	47	31.76
\$20,000–39,000	61	26.99	21	26.92	40	27.03
\$40,000 or more	38	16.81	13	16.67	25	16.89
Education						
< High School (HS) Diploma	51	20.56	18	19.57	33	21.15 0.683
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 0.009
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 0.059
No	135	55.33	58	63.04	77	50.66
Relation to Youth						
Parent	137	55.02	58	63.04	79	50.32 0.015

Personal Characteristics	Overall		Intervention		Comparison		p
	n	Est.	n ^a	Est.	n	Est.	
Relative	45	18.07	19	20.65	26	16.56	
Friend/Other	67	26.91	15	16.30	52	33.12	

^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.”

Table 4

Unadjusted and adjusted difference in mean change in communication scores in adult participants in intervention versus comparison groups

Outcomes of Interest	Baseline		Post Intervention	Difference in Mean Changes in Scores		
	n ^a	X (SD)		Unadjusted	Adjusted ^b	p
<i>Attitude towards Communication</i>						
Intervention	90	15.77 (3.18)	16.11 (3.05)	0.38	0.466	0.308
Comparison	149	15.27 (3.52)	15.23 (3.17)			
<i>Knowledge Communication</i>						
Intervention	91	0.83 (0.77)	0.75 (0.64)	-0.10	0.433	0.322
Comparison	152	0.86 (0.76)	0.88(0.89)			
<i>Self-efficacy of Communication</i>						
Intervention	84	39.12 (8.29)	43.37(5.98)	3.28	0.011	0.001 [*]
Comparison	144	37.15 (10.61)	38.12(10.04)			
<i>Communication about General Sex Topics</i>						
Intervention	86	16.85 (8.47)	22.14(6.24)	5.24	<.0001	0.0002 [*]
Comparison	143	17.94 (8.63)	17.98(8.35)			
<i>Communication about Sensitive Sex Topics</i>						
Intervention	85	5.52 (5.90)	10.32(6.17)	4.27	<.0001	0.0002 [*]
Comparison	138	7.61 (7.24)	8.15(6.81)			
<i>Overall Communication about Sex</i>						
Intervention	85	27.49(15.59)	39.44(13.14)	11.02	<.0001	<.0001 [*]
Comparison	138	31.25(17.26)	32.18(15.96)			
<i>Frequency of Parent-Teen Communication about General Sex Topics</i>						
Intervention	86	16.85 (8.47)	22.14 (6.24)	5.24	<.0001	0.0002 [*]
Comparison	143	17.94 (8.63)	17.98 (8.35)			
<i>Frequency of Parent-Teen Communication about Sensitive Topics</i>						
Intervention	85	5.01 (5.24)	9.21 (5.37)	3.64	<.0001	0.0009 [*]
Comparison	138	6.89 (6.36)	7.46 (6.11)			

^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.

* Significant at alpha level < 0.05

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