

Interventions to Improve Parental Communication About Sex: A Systematic Review

abstract



CONTEXT: The relative effectiveness of interventions to improve parental communication with adolescents about sex is not known.

OBJECTIVE: To compare the effectiveness and methodologic quality of interventions for improving parental communication with adolescents about sex.

METHODS: We searched 6 databases: OVID/Medline, PsychInfo, ERIC, Cochrane Review, Communication and Mass Media, and the Cumulative Index to Nursing and Allied Health Literature. We included studies published between 1980 and July 2010 in peer-reviewed English-language journals that targeted US parents of adolescents aged 11 to 18 years, used an experimental or quasi-experimental design, included a control group, and had a pretest/posttest design. We abstracted data on multiple communication outcomes defined by the integrative conceptual model (communication frequency, content, skills, intentions, self-efficacy, perceived environmental barriers/facilitators, perceived social norms, attitudes, outcome expectations, knowledge, and beliefs). Methodologic quality was assessed using the 11-item methodologic quality score.

RESULTS: Twelve studies met inclusion criteria. Compared with controls, parents who participated in these interventions experienced improvements in multiple communication domains including the frequency, quality, intentions, comfort, and self-efficacy for communicating. We noted no effects on parental attitudes toward communicating or the outcomes they expected to occur as a result of communicating. Four studies were of high quality, 7 were of medium quality, and 1 was of lower quality.

CONCLUSIONS: Our review was limited by the lack of standardized measures for assessing parental communication. Still, interventions for improving parent-adolescent sex communication are well designed and have some targeted effects. Wider dissemination could augment efforts by schools, clinicians, and health educators. *Pediatrics* 2011; 127:494–510

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KEY WORDS

parent, adolescent, communication, sex, systematic review

ABBREVIATION

MQS—methodologic quality score

Dr Akers designed the study; Dr Akers and Ms Holland abstracted the data; and Dr Akers, Ms Holland, and Dr Bost analyzed the data and prepared and reviewed the manuscript.

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Adolescent sexual behavior is a normal developmental milestone. However, the social and public health consequences of adolescent sexual activity are tremendous. Of the 18 million sexually transmitted infections diagnosed in the United States each year,^{1,2} half occur in adolescents.^{3–5} Pregnancy affects 750 000 adolescents annually, 80% of which are unintended.⁶ Despite recent declines in the number of sexually active adolescents, engagement in risky sexual behaviors remains problematic.⁷

Adolescents who recall a parent talking with them about sex are more likely to report delaying sexual initiation^{8–10} and increasing condom^{8,11,12} and contraceptive^{11,13} use. In light of these findings, interventions for improving parental communication about sex have been developed.¹⁴ Although dozens of interventions exist, they have not been rigorously compared. We sought to examine whether interventions for improving parental communication with adolescents about sex are effective at strengthening multiple communication domains and to assess the methodologic quality of these interventions.

METHODS

With the assistance of health science librarians, 6 databases were searched: OVID/Medline (1980 to July 2010), PsychInfo (1980 to July 2010), ERIC (1980 to July 2010), Cochrane Review (until July 2010), Communication and Mass Media (1980 to July 2010), and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to July 2010). We used terms for parent (eg, parent, caregiver), parenting (eg, mother-child relations, father-child relations), communication (eg, communication, health promotion), sex (eg, sex education, sex counseling), and experimental design (eg, intervention studies, pilot projects, clinical trials) along with Boolean con-

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("Parents"[MeSH] OR "Parents"[tw] OR "Single-Parent Family"[MeSH] OR "Single-Parent Family"[tw] OR "Parent-Child Relations"[MeSH] OR "Parent-Child Relations"[tw] OR "Caregivers"[MeSH] OR "Caregivers"[tw] OR "Mothers"[MeSH] OR "Mothers"[tw] OR "Fathers"[MeSH] OR "Fathers"[tw] OR "Single Parent"[MeSH] OR "Family"[MeSH] OR "Mother-Child Relations"[MeSH] OR "Father-Child Relations"[MeSH] OR "Single Parent"[tw] OR "Family"[tw] OR "Mother-Child Relations"[tw] OR "Father-Child Relations"[tw])
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AND

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("adolescent"[tw] OR "adolescence"[tw] OR "teens"[tw] OR "adolescent"[MeSH] OR "adolescent"[tw])
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AND

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("health promotion"[MeSH Terms] OR "health promotion"[tw] OR "Family plan*"[tw] OR "Sex education"[mh] OR "Sex counseling"[mh])
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AND

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("Intervention Studies"[MeSH] OR "Intervention"[ti] OR "Controlled Clinical Trials"[MeSH] OR "Controlled Clinical Trial"[pt] OR "trial"[ti] OR "clinical trials"[mh] OR "clinical trial"[pt])
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AND

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(English[Lang])
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AND

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("1980"[PDAT] : "2010"[PDAT])
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FIGURE 1

Sample search strategy for OVID/Medline.

nectors (ie, and, or). To identify additional articles that met our inclusion criteria, we hand-searched the reference list of each article on parent-adolescent communication, including review articles (see Fig 1 for an example of 1 of our search strategies).

Inclusion Criteria

We included studies that were published between January 1980 and July 2010; were published in peer-reviewed, English-language journals; empirically measured the effectiveness of interventions for improving parental communication with adolescents about sex; targeted parents of adolescents aged 11 to 18 years in the United States; and used an experimental or quasi-experimental study design that included a control group and a pretest/posttest design. Studies could target mothers, fathers, or both. Studies could target communication by parents with daughters, sons, or adolescents of both genders.

Data Abstraction

We initially searched each database to create a list of potentially eligible arti-

cles on the basis of title review. If there was any question of the article's relevance based on the title, we reviewed the abstract. If an abstract was not available or the articles' eligibility remained questionable after reading the abstract, we read the full text. For instances in which a single intervention was described in multiple published articles, we counted the interventions only once. The paper-based abstract and article review forms were pilot-tested and revised 3 times before the final forms were selected. Each pilot test was performed in a new electronic database. After the third pilot test, the forms functioned well for data abstraction from the remaining databases. We double-entered the abstracted data into a structured Excel database (Microsoft, Redmond, WA). Our review protocol is available on request.

Study Characteristics

Abstracted information included the interventions' inclusion and exclusion criteria, when the intervention was conducted, recruitment strategies, geographic setting, intervention- and

control-group characteristics, study design (eg, number of intervention sessions, intervention site and content), data-collection methods, primary outcomes, and attrition rate.

Only findings that resulted from statistical tests of hypotheses assessing relationships between the intervention (exposure) and its effects on parental communication (outcome) were extracted. For cases in which multiple postintervention assessments (eg, immediate postintervention, 3-month, 6-month) were made, we abstracted outcome data for each assessment time point. When insufficient data were presented in the published article to determine outcome results, we contacted the study authors to obtain the necessary data. We contacted the authors of 2 studies to obtain the means and SDs for the communication outcome measures they reported to permit comparison with data reported from other included studies. These data also would have aided in calculating effect sizes. In both instances, we reached the study authors but were unable to obtain the necessary data. However, we did not exclude any data. We report study results as they were cited in each author's original article.

Communication Outcomes

We abstracted data on multiple aspects of communication. Our selection of outcomes was guided by the integrated conceptual model (ICM).^{15,16} This model had previously been used to examine parental communication about sex. Developed by a National Institutes of Health consensus panel of health behavior experts, the ICM posits that 3 factors are necessary and sufficient for parent-adolescent communication to occur: skills; intentions; and the absence of environmental barriers or presence of facilitators of the behavior. Four factors influence intentions: self-efficacy; perceived social

norms; attitudes toward the behavior; and outcomes expected to occur as a result of engaging in the target behavior. Finally, 2 factors influence the previous 4: knowledge and beliefs about the behavior. We acknowledge that systematic reviews usually select only 1 outcome variable to examine. We included multiple domains of parental communication, because we recognized that a strict approach would severely limit the number of studies that would meet our inclusion criteria and, more importantly, would provide a less robust description of interventions' effect on parent-adolescent communication. When available, we included outcomes reported by parents and adolescents, because their perspectives regarding whether and how discussions about sex have occurred are often incongruent.^{17–20}

Each study's test of the relationship between intervention participation and a communication domain was counted as a separate finding. Thus, a single study could contribute multiple findings (eg, communication frequency, quality, self-efficacy). Furthermore, when unadjusted and controlled analyses were reported in the same study, only findings from the controlled analyses were abstracted, because they provide a more precise measure of effect. Two reviewers independently abstracted all data and then met to discuss and compare their findings. The interrater reliability for data abstraction was 0.97.

Data Synthesis

Ideally, each intervention's effect on a given communication domain would have been converted to an effect size that provides a standardized measure of the magnitude of each intervention's effect, which would have allowed us to perform a meta-analysis and calculate pooled effect sizes for each communication domain. However, this

was not possible because of variability in how communication domains were defined and measured across the studies.

Methodologic Quality

We systematically recorded information regarding each intervention's methodologic characteristics. We used a previously described and validated methodologic quality scoring (MQS) system.^{21,22} Scores on the 11-item MQS ranged from 0 to 20. Scores were grouped to denote lower- (score of 0–6), medium- (score of 7–14), and higher- (score ≥ 15) quality studies. The data were again abstracted by 2 independent coders, and the interrater reliability was 0.90.

RESULTS

Thirty-three parent-adolescent communication interventions were identified; 12 met inclusion criteria. Fig 2 shows the flow diagram for study inclusion and exclusion. Twenty-one studies were excluded. Several studies met more than 1 exclusion criteria. Four studies were excluded because they lacked a control group^{23–26}; 9 did not report parent-adolescent communication outcome data^{27–35}; 1 did not report outcome data for parent participants, only for adolescent participants³⁶; 3 included parents of younger children but did not stratify outcome data on the basis of the age of participating parents' children^{25,26,37}; 1 only included parents of preschool-aged children³⁸; parents participated in multiple interventions simultaneously in 1 study, which made it impossible to determine the individual effects of the parent-adolescent communication program³⁹; and 4 included non-US samples.^{40–43}

Study Characteristics

Of the 12 included studies, 8 were published between 2000 and 2008.^{44–51} The studies were published in 11 journals

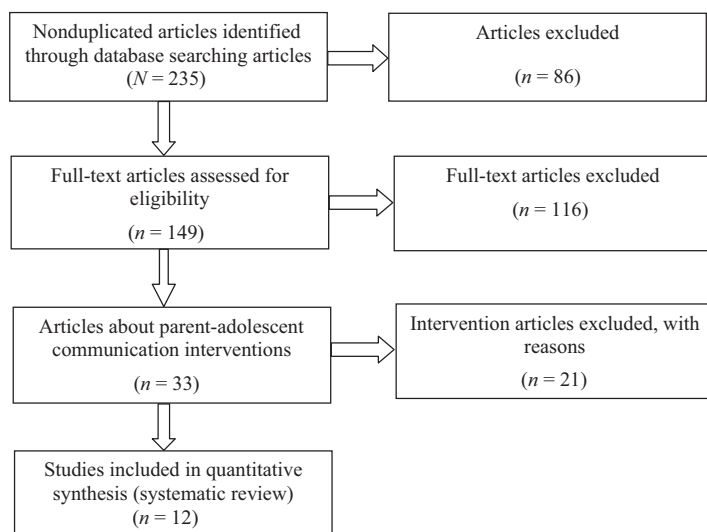


FIGURE 2
Systematic review flow diagram.

that represent a variety of disciplinary fields including psychology,^{46,50,52} family relations,^{44,53,54} adolescent health,^{47,55} general medicine,⁵¹ public health,⁴⁸ nursing,⁵⁶ and sexual health.⁴⁹

Overview of Communication Outcomes

Across all 12 studies, we identified 2 measures of actual communication: the frequency of parent-adolescent discussions about sex-related topics and the content of those discussions. Content of communication was assessed by using 3 measures: the number of sexuality-related topics ever discussed, as well as new and repeated topics discussed between follow-up periods. Specific measures regarding skills, intentions, self-efficacy (or comfort), attitudes, and outcomes expectations were identified. No studies assessed communication knowledge, environmental barriers/facilitators of communication, or perceived social norms regarding communication. Although we also found no measures that were explicitly titled “beliefs about communicating,” items contained in measures of perceived quality of communication seemed to tap parental beliefs about communicating. Hence,

we review outcome data on quality measures in “Quality (ie, Beliefs) of Communication.”

Studies varied widely in the number of communication domains assessed. The 2 most common domains measured were frequency and content of communication. Eight studies assessed communication outcomes by using both parent and adolescent reports. Every intervention used different measures to assess each of the communication domains. Most of these measures were developed by the investigators for their individual study.

Intervention Characteristics

Table 1 summarizes the characteristics of each of the 12 interventions included in this review. Six interventions were conducted in the South,^{47,48,50,54–56} 3 in the West,^{46,51,53} 2 in the Midwest,^{44,52} and 1 in the Northeast.⁴⁹ Only 2 targeted rural populations.^{50,53} We assigned each intervention an urban/rural designation on the basis of the authors’ report of intervention location and the US Census definition of urban/rural areas.⁵⁷ Nine studies were conducted as randomized controlled

trials, and the remainder used quasi-experimental designs.

Although the studies targeted parents of adolescents in different age ranges, all of them included parents of middle school students aged 11 to 14. Only 2 included high school students.^{46,51} One-third of the studies specifically targeted fathers⁴⁸ or mothers,^{46,50,56} and the remainder included predominantly mothers despite both parents being eligible. Participants in 3 studies consisted mostly of white respondents,^{53–55} 6 included predominantly black respondents,^{44,45,47–50} and the remainder included samples with more than 2 racial/ethnic groups.^{46,51,52}

Intervention Effectiveness

In general, authors of the studies reported that their interventions increased parental reports of parent-adolescent communication regardless of the communication domain assessed (Table 2).

Compared with adolescents, parents seemed more likely to report that interventions had a positive effect on communication domains and reported larger preintervention/postintervention changes. We summarize the findings for each communication domain below.

Frequency of Communication

In 5 of the 6 studies that assessed frequency of communication, parents reported an increase in communication from before to after testing.^{44,47,52,53,55} No change was noted in 1 study.⁴⁶ Four studies assessed adolescent reports of changes in the frequency of communication: 2 resulted in increases^{47,53}; the adolescent result was not reported for 1 study⁵²; and 1 resulted in no change.⁴⁶ Only 1 study compared the magnitude of change in the frequency of communication between parents and adolescents; parents reported a larger change than adolescents.⁴⁷

TABLE 1 Intervention Characteristics: Reviewed Studies and Their Methods and Findings

Intervention	Parent Participants	Racial Composition (%)	Intervention Year(s)	Sample Size, Parents, n	Sample Size, Adolescents, n	% Mothers	Region	Urbanicity	Study Design	Sessions	Site	Theoretic Framework	Attrition, %
Keepin' it REAL	Mothers of 11- to 14-y-olds	Black (97%); other (3%)	1996–2001	I: 160 (LSK); I: 154 (SCT); C: 156	I: 187 (LSK); I: 194 (SCT); C: 201	100	South	Urban	RCT	n = 7	CBO	PBT, SCT	I: 7 (SCT); I: 9 (LSK); C: 13
Facts and Feelings	Parents of 12- to 14-y-olds	White (95%); other (5%)	1989–1994	I: 126 families (full); C: 290 families (short)	I: 132 families (short)	NA	West	Urban and rural	RCT	n = 6	Home	None	I: 4.7; C: 10
Parents Matter!	Parents of 9- to 12-y-olds	Black (100%)	2001–2004	I: 378 (full); I: 371 (short); C: 366	I: 378 (full); I: 371 (short); C: 366	88	South	Urban	RCT	n = 5	School, CBO	SLT, PBT, TRA	26–30
Strong African American Families (SAAF)	Mothers of 11-y-olds	Black (100%)	1999–present	I: 172 (families); C: 150 (families)	I: 172 (families); C: 150 (families)	100	South	Rural	RCT	n = 7	CBO	Authors' model	I: 4; C: 3
REAL Men	Fathers of 11- to 14-y-old boys	Black (97%); other (3%)	1998–2005	I: 141; C: 132	I: 141; C: 132	NA	South	Urban	RCT	n = 7	CBO	SCT	20
Talking Parents, Healthy Teens	Parents of 6th- to 10th-graders	White (47%); black (17%); Hispanic (16%); Asian (14%); other (5%)	2002–2005	I: 269; C: 266	I: 315; C: 312	72	West	NA	RCT	n = 8	Worksite	IGM	P: 6; A: 4
Saving Sex for Later	Parents of 5th- to 6th-graders	Black (64%); Hispanic (28%); other (8%)	2003–2005	I: 345; C: 335	I: 362; C: 348	92	Northeast	Urban	RCT	NA	Home	SDT, DOI, TPB	NA
Huston Intervention	Parents of 6th- to 8th-graders	White (63%); Hispanic (31%); Asian (6%)	1988	I: 24; C: 8	NA	84	South	Urban	NRT	n = 4	School	None	I: 49; C: 53
CHAMP	Parents of 10- to 14-y-olds	Black (100%)	1996–2000 (first 2 waves)	I: 201; C: 264	I: 201; C: 264	59	Midwest	Urban	NRT	n = 12	Churches, schools, CBO	Authors' model	NA
Lefkowitz intervention	Mothers of 11- to 15-y-olds	White (50%); black (15%); Hispanic (18%); Asian (10%); mixed (6%)	1995–1997	I: 20; C: 20	I: 20; C: 20	100	West	Urban	RCT	n = 2	NA	None	I: 13; C: 26
Families in Touch-Understanding AIDS	Parents of 8th-graders	White (34%); black (33%); Hispanic (20%); Asian (5%); other (8%)	1998	94 ^a	93 ^a	NA	Midwest	Urban	RCT	6 d	Home	None	NA
Parent, Young Adolescent Family Life Education Project (PYALE)	Parents of 10- to 14-y-olds	White (77%); black (16%); other (7%)	1979–1981	I: 162; C: 23	I: 191; C: 24	79	South	Urban	NRT	n = 8	Church, school, CBO	None	25

I indicates intervention; C, control; LSK, life skills training; SCT, social cognitive theory; RCT, randomized controlled trial; CBO, community-based organization; PBT, problem behavior theory; DOI, diffusion of innovation theory; TPB, theory of planned behavior; NRT, nonrandomized trial; P, Parent; A, Adolescent. ^a Unclear how many parents were in the intervention group and how many were in the control group.

Content of Discussions

Six studies assessed the content of parent-adolescent conversations.^{45,46,48–51} Because of heterogeneity in how this communication domain was defined (ie, number of new topics discussed, repeated topics, individual topics discussed, percentage of topics discussed, mean number of topics discussed, and percentage that reported lower scores from scale measures), it is difficult to summarize the findings. In general, parents reported an increase in the content of communication, whereas adolescent reports were highly varied. Only 1 study compared the magnitude of change in the mean number of repeated topics reported by parents and adolescents.⁵¹ The study authors found that parents reported discussing more topics at the postintervention assessment than adolescents.

Skills for Communicating

One study assessed parental skills for communicating.⁴⁶ In that study, parents and adolescents were directly observed discussing both sexuality and AIDS. The skills assessed were how long the mothers and adolescents each spoke, how many questions mothers asked, the number of open-ended questions the mothers asked, maternal display of warmth, maternal display of support, and maternal use of nonjudgmental behaviors. Compared with mothers in a control condition, mothers who participated in the intervention group spoke less and were less judgmental when discussing AIDS at the postintervention assessment compared with the preintervention assessment. Compared with mothers in a control condition, mothers who participated in the intervention group asked more open-ended questions when discussing sexuality or AIDS at the postintervention assessment compared with the preintervention assessment.

TABLE 2 Intervention Outcomes for Each Communication Domain

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
Frequency	Parents Matter ^a	9-item scale; 2-point Likert scale (eg, never, lots of times); higher scores denote more frequent communication	No pre/post outcome data were presented for parents or adolescents, only differences in mean change between each of the 3 intervention arms for each assessment period	See right	Parents and adolescents in the enhanced intervention (2 sessions) reported increased communication compared to single-session intervention or the control group; magnitude of change between pre- and immediate postintervention assessments was reportedly greater among adolescents than parents; at subsequent follow-up postintervention assessments; magnitude of change was reportedly greater among parents than adolescents, although the magnitude of the difference in means decreased over time
	CHAMP ^b	Measure not described or referenced; lower scores denote more frequent communication	Pre: 13.5 (5.0); post: 11.8 (5.2); <i>t</i> score ^d : -0.30 (NS)	Pre: NR; post: 14.1 (4.6); <i>t</i> score: -6.9	Parents in the intervention group reported increased frequency of communication relative to the control group
	Huston ^b	Assess No. of times 11 sexual topics were discussed; 6 response options (ie, 0, 1, 2, 3, 4, >5 times); responses summed yielding frequency score; compared difference in frequency score pre- and postintervention; higher scores denote more frequent communication	Pre: NR; post: 10.9 (7.3) ^f	Pre: NR; post: -2.50 (5.66) ^f	Parents in the intervention group reported increased frequency of communication relative to the control group
	Lefkowitz ^a	Assessment of discussions regarding 10 sexuality- and AIDS-related topics during previous 2 wk; dichotomous response (yes/no); reported mean No. of topics discussed	Parents: pre: 0.5 (0.9); post: 0.4 (1.1) Adolescents: pre: 0.5 (1.1); post: 0.9 (2.3)	Parents: pre: 0.3 (0.6); post: 0.4 (1.0) Adolescents: pre: 0.3 (0.5); post: 0.5 (0.8)	No difference reported for parents or adolescents
	Facts and Feelings ^a	Parents: assessed frequency of discussion of 14 topics in previous 3 mo; 4-point Likert scale (eg, no talk, >4 times); higher scores denote more frequent communication Adolescents: assessed frequency of discussion of 15 topics in previous 3 mo; 4-point Likert scale (eg, no talk, >4 times); higher scores denote more frequent communication	Exact point estimates for pre- and postintervention (3- and 12- mo) outcomes not presented	See right	Parents: parents in the video-only and the video + newsletter groups showed a larger increase in the frequency of communication than those in the control group; half the gain in communication frequency was lost in both intervention groups by 12 mo; control-group parents experienced a gradual increase in communication Adolescents: adolescents whose parents were in either intervention group showed a larger increase in the frequency of communication than those in the control group; adolescents whose parents were in the video + newsletter group showed a larger increase than those in the video-only group; at 12 mo, all 3 groups returned to their baseline frequency of communication

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
Families in Touch ^a	Families in Touch ^a	The modified Fisher scale measured parent-child communication about sex by using a 8-item scale; 4-point Likert scale; scores ranged from 0-32; higher scores denote more frequent communication	Parent: MPre: NR MPost: NR Pre(F _{statistic}): NR Post(F _{statistic}): NR 2 wk(F _{1,52}) = 5.53 (.05) Adolescent: MPre: NR MPost: NR Pre(F _{1,143}) = 6.17 (.01) (mother); F _{1,138} = 4.68 (<.05) (father) Post(F _{statistic}): NR 2 wk(F _{statistic}): NR	Parents: pre: NR; 2 wk: NR Adolescents: pre: NR; 2 wk: NR	Parents in the intervention group reported increased frequency of communication relative to control group
			Parent: MPre: NR MPost: 2.53 Pre(F _{statistic}): NR Post(F _{1,52}): 4.36 (<.05) M2 wk(F _{1,52}) = 5.86 (<.05) Adolescent: MPre: NR MPost: NR Pre(F _{1,143}) = 5.05 (<.05) (mother); F _{1,138} = 4.82 (<.05) (father) Post(F _{statistic}): NR 2 wk(F _{statistic}): NR	Parents: pre: NR; 2 wk: see F statistic (left) Adolescents: pre: see F statistics (left); 2 wk: 1.85	Parents in the intervention group reported speaking with their adolescent more about AIDS compared to the control group
Ever discussed Talking Parents ^a	Talking Parents ^a	Parents: assessed whether ever discussed 24 sex-related topics at baseline and summed the responses; at each postintervention assessment, calculated the No. of new topics discussed between visits and the No. of repeated topics Adolescents: assessed whether ever discussed 22 sex-related topics at baseline and summed the responses; at each postintervention assessment, calculated the No. of new topics discussed between visits and the No. of repeated topics	Parents: pre: 8.9 (5.5); 1 wk (No. of new topics): 4.0 (NR); 3 mo (No. of new topics): NR; 9 mo (No. of new topics): NR; 1 wk (repeat topics): 6.4 (NR); 3 mo (repeat topics): NR; 9 mo (repeat topics): NR Adolescents: pre: 7.2 (5.3); 1 wk (No. of new topics): 3.3 (NR); 3 mo (No. of new topics): NR; 9 mo (No. of new topics): NR; 1 wk (repeat topics): NR; 3 mo (repeat topics): 4.5 (NR); 3 mo (repeat topics): NR; 9 mo (repeat topics): NR	Parents: pre NR; 1 wk (No. of new topics): 0.8 (NR); 3 mo (No. of new topics): NR; 9 mo (No. of new topics): NR; 1 wk (repeat topics): 3.7 (NR); 3 mo (repeat topics): NR; 9 mo (repeat topics): NR Adolescents: pre: NR; 1 wk (No. of new topics): 1.4 (NR); 3 mo (No. of new topics): NR; 9 mo (No. of new topics): NR; 1 wk (repeat topics): 3.3 (NR); 3 mo (repeat topics): NR; 9 mo (repeat topics): NR	The mean No. of new topics parents and adolescents reportedly discussed between baseline and the immediate postintervention assessment increased; the magnitude of the mean difference in the No. of new topics reportedly discussed by parents and adolescents in the intervention and control group was the same at 3 and 9 mo as at 1 wk after the intervention; the difference in the mean No. of repeated topics reported by parents and adolescents increased significantly at 3 and 9 mo

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
Lefkowitz ^a	Lefkowitz ^a	One item assessed whether ever communicated about AIDS; 5-point Likert scale (eg, not at all, a lot)	Exact point estimates for pretest or postintervention outcomes not presented	See right	No increase in communication about AIDS reported by mothers or adolescents
		One item assessed whether ever communicated about sexuality; 5-point Likert scale (eg, not at all, a lot)	Exact point estimates for pretest or postintervention outcomes not presented	See right	No increase in communication about sexuality reported by mothers or adolescents
Lefkowitz ^a	Lefkowitz ^a	One item assessed whether ever communicated about birth control; 5-point Likert scale (eg, not at all, a lot)	Parents: pre: NR; post: NR Adolescents: pre: 1.5 (1.0); post: 2.2 (1.4)	Parents: pre: NR; post: NR Adolescents: pre: 1.7 (1.1); post: 1.8 (1.3)	Increased communication about birth control reported among intervention adolescents but not mothers
		Fathers: assessed whether 16 topics had ever been discussed between fathers and sons; 3 response options (eg, not discussed, discussed a lot); responses summed to yield a summary score that ranged from 0 to 48	Parents: pre: NR; 3 mo: 22.60 (14.22); 6 mo: 22.98 (13.97); 12 mo: 23.33 (14.37)	Parents: pre: NR; 3 mo: 18.29 (15.89); 6 mo: 20.38 (16.01); 12 mo: 19.77 (15.27)	Fathers: intervention fathers reported having ever discussed more topics than control-group fathers at 3 and 12 mo but not at the 6-mo postintervention assessment
REAL Men ^a	REAL Men ^a	Adolescent sons: assessed whether 13 topics had ever been discussed; 3 response options (eg, not discussed, discussed a lot); responses summed to yield a summary score that ranged from 0 to 39	Adolescents: pre: NR; 3 mo: 23.19 (12.57); 6 mo: 22.73 (13.91); 12 mo: 23.63 (12.50)	Adolescents: pre: NR; 3 mo: 20.54 (13.51); 6 mo: 21.93 (14.35); 12 mo: 20.02 (13.73)	Adolescent sons: there were no significant differences between reports of discussions by sons whose fathers were in the intervention group; did not report more discussions than those in the control groups at any of the postintervention assessments
		Assessed whether 14 topics had ever been discussed; responses summed to yield a score that ranged from 0 to 14; scores outcome denotes percent reporting lower scores	Pre: 22.6%; post: 13.9%	Pre: 18.7%; post: 25.7%	Parents in the intervention group were less likely to report low levels of communication after the intervention
Strong African American Families ^b	Strong African American Families ^b	Assessed whether 9 topics had ever been discussed; 3 response options (ie, no, yes, quite a bit)	Pre: 4.97 (3.01); post (3 mo): 0.14 (0.12) ^h	Pre: 5.76 (3.03); post (3 mo): -0.16 (0.13) ^h	Parents reported greater communication between the pretest and posttest assessments
		Assessed whether mothers had ever discussed 15 items; reported percentage of topics discussed in the previous 3 mo	Parents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 55% (intervention based on SCT); 54% (intervention based on LSK)	Parents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 45%	Mothers in the SCT group reported discussing a greater proportion of topics compared to those in the control group; there was no difference in the proportion of topics discussed between mothers in the LSK group compared with the control group
Skills	Lefkowitz	External assessment of maternal and adolescent speaking time and 4 maternal communication behaviors (asking questions, asking open-ended questions, showing support, being nonjudgmental) when discussing sexuality and AIDS	Adolescents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: NR Conversations about sexuality Speaking time: NR Asking questions: pre: 3.8 (1.5); post: 4.3 (1.0); F statistic: 1.49 (23)	Adolescents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: NR Conversations about sexuality Speaking time: NR Asking questions: pre: 3.6 (1.6); post: 3.4 (1.4)	Parents: intervention mothers spoke less at time 2 than at time 1 compared with the delayed control group when discussing AIDS; intervention mothers were less judgmental at time 2 than at time 1 compared with the delayed control group when discussing AIDS; intervention mothers asked more open-ended questions at time 2 than at time 1 compared with the delayed control group when discussing AIDS or sexuality
			Asking open-ended questions: pre: 3.2 (1.1); post: 3.6 (1.3); F statistic: 3.80 (0.06)	Asking open-ended questions: pre: 3.4 (1.5); post: 2.8 (1.4)	

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
Intentions	REAL Men ^b	Assessed intentions regarding discussing 16 sexual topics in the future; 5 response options (eg, definitely won't, definitely will); responses summed to yield a summary score that and ranged from 16 to 80.	Showing warmth/support: pre: 3.6 (0.6); post: 3.4 (0.8); F statistic: 0.55 (47) Being non-judgmental: pre: 4.8 (0.4); post: 4.8 (0.5); F statistic: 2.05 (16) Conversations about AIDS Speaking time: 38 s less than controls ($P = .4$) Asking questions: pre: 3.0 (1.4); post: 3.4 (1.3); F statistic: 0.62 (0.44) Asking open-ended questions: pre: 2.3 (1.3); post: 3.2 (1.3); F statistic: 6.03 (0.02) Showing warmth/support: pre: 3.6 (0.6); post: 3.6 (0.7); F statistic: 0.30 (0.59) Being nonjudgmental: pre: 4.7 (0.4); post: 5.0 (0.2); F statistic: 9.08 (0.004) Pre: NR; 3 mo: 72.75 (10.05); 6 mo: 70.51 (10.12); 12 mo: 70.37 (12.37)	Showing warmth/support: pre: 3.9 (0.5); post: 3.4 (1.2) Being nonjudgmental: pre: 4.8 (0.5); post: 4.4 (1.2) Conversations about AIDS Speaking time: 38 s more than intervention ($P = .4$) Asking questions: pre: 3.0 (1.7); post: 2.9 (1.2) Asking open-ended questions: pre: 2.7 (1.5); post: 2.3 (1.2) Showing warmth/support: pre: 3.8 (0.5); post: 3.7 (0.8) Being nonjudgmental: pre: 4.9 (0.4); post: 4.6 (0.6) Pre: NR; 3 mo: 70.10 (13.69); 6 mo: 70.50 (13.28); 12 mo: 67.32 (14.66)	There were no differences in intentions to communicate between the intervention and control groups at 3 and 6 mo; fathers in the intervention group had greater intentions to communicate at the 12-mo postintervention assessment
Self-efficacy	Keepin' it REAL ^b Parents Matter ^a	Assessed intentions to discuss each of 15 sexual topics in the future; reported percentage of topics mothers intended to discuss in future Parents: 5-item scale; 3-point Likert scale (eg, not true at all, very true); higher score denotes greater self-efficacy Adolescents: 6-item scale; 3-point Likert scale; higher score denotes greater perceived parental self-efficacy	Pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 78% (SCT); 69% (LSK) No pre/post outcome data were presented, only differences in mean change between assessment periods	Pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 60% See right	Mothers in the SCT and LSK groups reported greater intentions to discuss topics compared with those in the control group Enhanced intervention (2 sessions) showed improved parental self-efficacy (parental and adolescent reports) compared with single-session intervention or control group Magnitude of change between preintervention and immediate postintervention assessments was greater among adolescents than parents; at subsequent follow-up visits, magnitude of change was reportedly greater among parents than adolescents, although the magnitude of difference in means declined over time

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
	Saving Sex for Later ^b	Assessed how prepared parents felt to discuss specific sexual health issues; 7-item scale; 4 response options (eg, not at all, very prepared); responses summed to yield a score that ranged from 7 to 28; scores were dichotomized, outcome denotes the percentage with lower scores	Pre: 32.9; post: 16.4	Pre: 27.0; post: 23.6	Parents in the intervention group were less likely to report low levels of self-efficacy compared to control group parents
	Keepin' it REAL ^b	16-item scale assessing parenting self-efficacy for talking with adolescents about sex; 7-point scale (eg, not sure at all, completely sure); higher scores denote greater self-efficacy	Exact point estimates for pretest or postintervention (4, 12, and 24 mo) outcomes were not presented	See right	Data were not reported, but authors stated that self-efficacy for communication increased over time
	REAL Men ^b	Assessed confidence talking with sons about sex; 17 items; 7-point Likert scale (eg, not sure at all, completely sure); responses summed to yield a summary score that ranged from 17 to 119; higher scores denote greater confidence	Pre: NR; 3 mo: 96.55 (13.16)	Pre: NR; 3 mo: 88.73 (21.80)	Fathers in the intervention group had increased self-efficacy scores compared to control group fathers
	Talking Parents ^a	One item assessed ability to communicate about sexual health topics; 7-point Likert scale (eg, excellent, terrible)	Exact point estimates for pretest or postintervention (1 wk, 3, and 9 mo) outcomes not presented	See right	Parents: intervention parents reported significantly higher self-efficacy for communication at each follow up assessment (1 wk, 3 and 9 mo) Adolescents: intervention adolescents reported significantly higher self-efficacy for communicating with parents at 3 and 9 mo
Comfort	CHAMP ^b	Number and type of items not described, 4-point Likert scale	Pre: 16.2 (4.3); post: 9.5 (3.8); <i>t</i> score: -17.4	Pre: NR; post: 17.3 (4.2); <i>t</i> score: -10.4	Increased comfort with communicating among intervention group relative to control group
	Lefkowitz ^a	Comfort talking about 10 sexuality-related topics; 7-point Likert scale; responses summed and mean score reported	Parents: pre: 4.6 (1.4); post: 4.8 (0.9) Adolescents: pre: 5.0 (0.7); post: 5.2 (0.6)	Parents: pre: 5.1 (0.6); post: 5.0 (0.7) Adolescents: pre: 4.7 (1.0); post: 4.5 (1.0)	Increased comfort with general communication reported by adolescents but not mothers
	Keepin' it REAL ^a	Assessed comfort discussing each of 15 topics; reported percentage of topics mothers comfortable discussing in the previous 3 mo	Parents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 62% (SCT); 59% (LSK) Adolescents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: NR	Parents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: 44% Adolescents: pre: NR; 4 mo: NR; 12 mo: NR; 24 mo: NR	Mothers in the SCT and LSK groups reported greater comfort compared to the control group

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
Attitudes	Parent, Young Adolescent Family Life Education (PYAFLE) project ^a	Assessed self-reported personal attitudes toward parent-adolescent communication with adolescent about sex; No. of items not provided; 4-point Likert scale (eg, strongly agree, strongly disagree)	Parents: pre: NR (P0); NR (A0); NR (PAT); NR (PAS); NR (PAST); 2 mo: NR (P0); NR (A0); NR (PAT); NR (PAS); NR (PAST)	Parents: pre: NR; 2 mo: NR	Parents: the difference between pretest and posttest means for the control and all intervention groups was "minimal"; the control group experienced no change in the pretest and posttest means; the P0 and PAT groups experienced a decrease in mean attitudinal scores between the pre- and postintervention assessment; the greatest improvement in self-reported personal attitudes was among parents in the PAS group
Outcome expectations	Keepin' it REAL ^b	Assessed mothers' perception of outcomes associated with talking about sexual topics using a 15-item scale; 5-point scale (eg, strongly disagree, strongly agree); responses summed to yield a summary score that ranged from 15 to 75; higher scores denote greater perceived positive outcomes	Adolescents: pre: 2.84 (NR) (P0); 2.71 (NR) (A0); 2.89 (NR) (PAT); 2.82 (NR) (PAS); 2.83 (NR) (PAST); 2 mo: 2.95 (NR) (P0); 2.78 (NR) (A0); 2.90 (NR) (PAT); 2.83 (NR) (PAS); 2.92 (NR) (PAST)	Adolescents: pre: 2.82; 2 mo: 2.83	Adolescents: the control group and the PAS and PAT groups experienced no change; the greatest improvement in attitudes was among the P0 and PAST groups
	REAL Men ^b	Perceptions of outcomes expected to occur after talking with sons about sexual topics; 23 items; 5-point Likert scale (eg, strongly agree, strongly disagree); responses summed to yield a summary score that ranged from 23 to 115; higher scores correspond to more positive outcomes	NR	NR	There was no difference between pre- and postintervention assessment in outcome expectations
Quality	Facts and Feelings ^a	Parents: 5 items assessed quality of communication; 5-point Likert scale (eg, strongly agree, strongly disagree); higher scores denote higher quality	Exact point estimates for pretest or postintervention (4, 12, and 24 mo) outcomes were not present	See right	Parents: parents in the video-only and the video+newsletter groups showed a larger increase in the quality of communication than those in the control group; observed increase decreased by half in both intervention groups by 12 mo; control-group parents showed no change across assessment periods
		Adolescents: 10 items; 5-point Likert scale (eg, strongly agree, strongly disagree); higher scores denote higher quality			Adolescents: there was no difference in adolescent reports of the quality of communication from pre- to postintervention assessment

TABLE 2 Continued

Communication Domain	Intervention	Description of Outcome Measure	Intervention-Group Outcomes ^c	Control-Group Outcomes ^c	Direction of Change
	Talking Parents ^a	Parents: 12-item scale assessed openness of parent-adolescent communication about sexual topics; 4-point Likert scale (eg, strongly agree, strongly disagree); the overall baseline distribution; higher scores denote more openness Adolescents: 7-item scale assessed openness of parent-adolescent communication about sexual topics; 4-point Likert scale (eg, strongly agree, strongly disagree); scores assessed as the centile of the overall baseline distribution; higher scores denote more openness	Exact point estimates for preintervention and postintervention outcomes not presented	See right	Parents: parents in the intervention group reported higher scores at each follow up (1 wk and 3 and 9 mo) Adolescents: adolescents reported significantly higher scores at each follow up (1 wk and 3 and 9 mo)

Reported results are significant unless otherwise specified. NS indicates not significant; NR, not reported; SCT, social cognitive theory; LSK, life skills program; PO, parent only; AO, adolescent only; PAT, parent and adolescent together; PAS, parent and adolescent separate; PAST, parent and adolescent separate then together.

^a Data were reported from both parents and adolescents.

^b Data were reported from parents only.

^c Responses are reported as mean (SD), unless otherwise noted.

^d Compared pretest/posttest means for the intervention group only.

^e Compared posttest mean for the intervention group to the control group.

^f Change in mean scale score between preassessment and postassessment periods with SD deviation in parentheses.

^g The F statistic tests the treatment effect at the posttest while controlling for the pretest result.

^h z score.

Intentions to Communicate

Two studies assessed communication intentions. In both studies, parents reported an increase in their intentions to communicate.^{45,48} Data were not collected from adolescents in either study.

Self-efficacy for Communicating

Five studies assessed parental self-efficacy for communicating.^{45,47–49,51} Data were reported from only 4 studies.^{47–49,51} In all 4 studies, parents reported an increase in their self-efficacy for communicating. Two studies assessed adolescent reports of changes in self-efficacy. In 1 study, adolescents reported an increase in their perception of their parents' self-efficacy for communicating with them about sex.⁴⁷ In the second study, adolescents reported an increase in their self-efficacy for communicating with their parent about sex.⁵¹ Only 1 study compared the magnitude of change reported by parents versus adolescents, and the authors noted that parents reported a larger change than adolescents.⁴⁷

Comfort With Communicating

Three studies reported communication comfort instead of or in addition to self-efficacy.^{44–46} Parents reported an increase in comfort in 2 studies.^{44,45} Only 1 study reported data from adolescents, and the authors noted an improvement.⁴⁶ The magnitude of the change in communication comfort reported by parents and adolescents was not compared in any of these studies.

Attitudes Toward Communicating

One study assessed attitudes toward communicating, and the authors noted no significant change in parents' or adolescents' self-reported personal attitudes towards parent-adolescent communication about sex.⁵⁴

Outcomes Expected to Occur After Communicating

Two studies assessed the outcomes expected to occur as a result of parent-adolescent discussions about sex.^{45,48} Both studies assessed only parental perspectives, but the authors of only 1 study reported actual data for this outcome⁴⁵ and noted no change in outcome expectations.

Quality (ie, Beliefs) of Communication

Quality of communication was included as a marker of parental beliefs about communicating. In both studies that assessed the quality of communication, parents reported improvements.^{51,53} The duration of this effect seemed to decline over time in 1 study⁵³ yet continued to improve significantly in the other.⁵¹ Adolescents reported improvement in the quality of communication in 1 study⁵¹ but no change in quality in the other.⁵³ The magnitude of the change in quality reported by parents and adolescents was not compared in either study.

Methodologic Quality

The frequency distributions for each element of the MQS are listed in Table 3. MQSs ranged from 6 to 16 points (mean: 12 ± 3) (Table 4). Only 1 study had an MQS in the lower-quality range⁵⁴; 7 were of medium quality,^{44,46,48,49,51,52,55} and 4 were of high quality.^{45,47,50,53}

Reliability/Validity Assessment

Studies infrequently reported validity or reliability data for the measures used to assess study outcomes. For 7 studies the communication outcome measures were developed de novo,^{46,47,49,51,53–55} and psychometric data were reported for their scales in only 3 studies.

Theoretical Grounding

The authors of 7 studies reported using a theoretical framework to guide the intervention design and analytic inquiry.^{44,45,47–51} The most commonly used theory was social cognitive theory.^{45,48}

TABLE 3 Criteria for Assessing Methodologic Quality and Frequency Distributions for Each Quality Characteristic

Methodologic Characteristic	Scoring Options (Maximum Total Score = 20 Points)	Distribution of Characteristics Among Included Studies	
		Frequency, n (%)	Reference No.
Definition of parental communication	Not reported: 0	1 (8)	54
	Global: 1	0 (0)	—
	Communication domain-specific: 2	11 (92)	44–53 and 55
Validity data for parental communication scores	Not reported: 0	11 (92)	44 and 46–55
	Reported: 1	1 (8)	45
Reliability data for parental communication scores	Not reported: 0	5 (42)	44, 46, 49, 51, and 54
	Reported: 1	7 (58)	45, 47, 48, 50, 52, 53, and 55
Validity/reliability data for other main variables in study	Not reported: 0	9 (75)	44, 46–49, 51, 52, 54, and 55
	Reported: 1	3 (25)	45, 50, and 53
Theoretical framework presented	Did not present: 0	5 (42)	46 and 52–55
	Presented: 1	7 (58)	44, 45, and 47–51
Research paradigm	Quantitative or qualitative: 1	12 (100)	44–55
	Mixed methods: 2	0 (0)	—
	Correlational or cross-sectional: 1	6 (50)	44, 49, 50, 52, 54, and 55
Study design	Longitudinal: 2	6 (50)	45–48, 51, and 53
	Undetermined: 0	1 (8)	52
	<100: 1	2 (17)	46 and 55
Sample size	>100 to <300: 2	4 (33)	44, 48, 50, and 54
	>300: 3	5 (42)	45, 47, 49, and 51, 53
	Convenience/nonprobability: 0	4 (33)	44, 52, 54, and 55
Sample design	Random/probability but not nationally representative: 1	8 (67)	45–51 and 53
	Random/probability and nationally representative: 2	0 (0)	—
	Qualitative/univariate/descriptive: 1	0 (0)	—
Data analysis	Bivariate/ANOVA: 2	4 (33)	44, 46, 52, and 54
	Multiple/logistic regressions: 3	6 (50)	45, 47, 48, 51, 53, and 55
	Multivariate: 4	2 (17)	49 and 50
	Inappropriate: 0	2 (17)	49 and 54
Appropriate inferences of causality	Inappropriate: 0	2 (17)	49 and 54
	Appropriate: 1	10 (83)	44–48, 50–53, and 55

ANOVA indicates analysis of variance.

TABLE 4 Methodologic Quality Scores for Each Intervention

Intervention	A	B	C	D	E	F	G	H	I	J	K	MQS Score
Keepin' it Real ⁴⁵	2	1	1	1	1	1	2	3	1	3	1	17
Facts and Feelings ⁵³	2	0	1	1	0	1	2	3	1	3	1	15
Parents Matter! ⁴⁷	2	0	1	0	1	1	2	3	1	3	1	15
Strong African American Families (SAAF) ⁵⁰	2	0	1	1	1	1	1	2	1	4	1	15
REAL Men ⁴⁸	2	0	1	0	1	1	2	2	1	3	1	14
Talking Parents, Healthy Teens ⁵¹	2	0	0	0	1	1	2	3	1	3	1	14
Saving Sex for Later ⁴⁹	2	0	0	0	1	1	1	3	1	4	0	13
Huston intervention ⁵⁵	2	0	1	0	0	1	1	1	0	3	1	10
CHAMP ⁴⁴	2	0	0	0	1	1	1	2	0	2	1	10
Lefkowitz intervention ⁴⁶	2	0	0	0	0	1	2	1	1	2	1	10
Families in Touch ⁵²	2	0	1	0	0	1	1	0	0	2	1	8
Parent, Young Adolescent Family Life Education Project (PYAFLE) ⁵⁴	0	0	0	0	0	1	1	2	0	2	0	6

Definition of parental communication outcomes: B, validity data for parental communication measures; C, reliability data for parental communication measures; D, validity and reliability data for other intervention variables; E, theoretical framework; F, research paradigm; G, design; H, sample size; I, sample design; J, data analysis; K, appropriate inferences of causality.

Research Paradigm

All the interventions used a quantitative, questionnaire-based analytic par-

adigm; follow-up cross-sectional study designs were the most frequently used. None of the studies used a qual-

itative research paradigm or mixed-methods evaluation approach.

Study Design

Five studies used a longitudinal design (ie, postintervention assessment with at least 1 additional follow-up assessment). Four of these studies conducted 1 immediate postintervention assessment and 2 additional follow-up assessments; the other study included 1 postintervention assessment and 1 additional follow-up assessment. In these longitudinal studies, participants were followed for a maximum of 9,⁵¹ 12,^{47,48} or 24⁴⁵ months.

Sample Size and Design

Nine studies used a medium sample size^{44,48,50,53,54} (100–300 participants) or larger^{45,47,49,51} (>300 participants), but the majority of them used convenience, nonprobability samples. None of the studies included a sample that was both randomly selected and nationally representative. Conduction of a power calculation to determine the sample size needed to assess the study outcomes was reported for only 2 studies.

Analytic Approach

Half the studies used multiple or logistic regression techniques to analyze their data,^{45,47,48,51,53,55} whereas one-third reported only bivariate methods (eg, correlations or analysis of variance).^{44,46,52,54} The authors of only 2 studies cited using a repeated-measures design.^{49,50} Similarly, few authors reported using analytic techniques to account for nested study designs for studies in which the participants participated in group-based facilitated interventions or when they were recruited from multiple settings (eg, schools, community organizations). Use of multivariate analytical techniques (eg, structural equation modeling) was not reported from any study.

Inferences of Causality

Given many of the studies' sample and design limitations, we were interested

in assessing each researcher group's awareness and acknowledgment of their study's limitations and ability (or not) to establish cause-effect relationships. Among the reviewed studies, limitations of the findings were accurately reported for 10; authors of 2 reports inappropriately stated or implied that their intervention was effective despite multiple threats to internal validity (eg, sample size, analytic approach, limited follow-up data) that made such determination difficult.

DISCUSSION

We compared the effectiveness and methodologic quality of select interventions that met our inclusion criteria and were designed to improve parents' ability to communicate with their adolescents about sex. Our evaluation was limited by the fact that every study used a different measure to assess the same communication domain. Which measures are used will certainly affect whether significant findings are observed. Despite this heterogeneity among the communication-outcome measures, the data suggest that parent-adolescent communication interventions have some targeted effects. Compared with controls, parents who participate in these interventions experience improvements in multiple communication domains. We noted improvements in the frequency, quality, intentions, comfort, and self-efficacy for communicating. We did not find any effect on parental attitudes toward communicating or the outcomes they expected to occur as a result of communicating.

Communication is a complex process. We assessed specific aspects of the communication process defined by our guiding conceptual model. However, other facets of communication and other conceptual frameworks are likely equally important. For example, Jaccard⁵⁸ identified 5 aspects of parent-adolescent

communication as important: the extent of communication as measured by frequency and depth of discussions; the style or manner in which information is communicated; the content of the information discussed; the timing of communication; and the general family environment or overall relationship between the parent and child. Had we assessed a different set of communication outcomes, our overall perception of the effectiveness of these interventions may have differed.

Although positive effects on the frequency, content, and psychosocial mediators of parental communication with adolescents about sex were noted for most interventions, few studies assessed the durability of these effects over time. Those that did found mixed results. Because adolescents' sexual knowledge and behaviors change throughout adolescence, parents' approach to discussing sex with their adolescents must change as well. It remains unclear whether participation in these interventions provides sufficient support for parents' communication efforts throughout their child's adolescence. Future studies should seek to clarify the long-term effect of these interventions on parent-adolescent communication about sex.

The explicit teaching and measurement of communication-skills acquisition received little attention in the studies included in this evaluation. Yet, the results indicate that the approaches parents take when talking with their adolescent about sex may have a tremendous influence on the adolescent. For example, parents who dominate conversations (ie, talk more) have adolescents who are less knowledgeable about sexual health topics.^{59,60} Because communication skills are important, researchers have suggested that parents be taught certain general communication skills such as how to talk less and listen more, be less directive, ask more questions of their ad-

olescent, and behave in a nonjudgmental fashion.^{46,61–63} Adolescents whose parents engage in these behaviors report greater comfort discussing sex with their parents and discussing more topics.⁴⁶ Research in this area needs a greater focus on identifying which communication skills are most effective for transmitting sexual health knowledge and decision-making skills to their adolescents.

With 1 exception, mothers were the primary participant in all interventions. None of the studies compared intervention effects on fathers and mothers. Although mothers primarily communicate with adolescents about sex,^{11,64–66} fathers do play a role in their adolescents' sexual socialization.⁶⁷ However, mothers and fathers play different roles.^{68,69} Kirkman et al⁶⁸ examined the role of fathers in family discussions about sex through in-depth interviews with parents and adolescents of both genders. They found that the pubertal transition often disrupts the relationship and communication patterns fathers have with their children; that fathers find discussions about sex difficult and distressing; and that fathers generally leave the task of talking about sex to mothers, although fathers perceive the responsibility of communicating to be a shared one. Additional work is needed to explore intervention effects on mothers versus fathers, because interventions for improving parental communication about sex may require tailoring to maximize their effectiveness among each. Similarly, none of the included interventions explored whether intervention effects varied according to adolescent gender. Given that parental discussions about sex vary in frequency and content for adolescent boys and girls,^{66,69,70} additional work is needed to determine if these interventions produce differential effects based on adolescent gender.

Implications

Despite the limitations inherent in parent-adolescent communication interventions, our interpretation of the data is that these interventions, at a minimum, improve the frequency and content of discussions about sex between parents and their adolescents. Wider dissemination of the interventions seems warranted but should be done in conjunction with additional studies that clarify these interventions' effects. For example, communication measures should be standardized, and differential intervention effects among mothers versus fathers and among adolescent boys versus girls should be explored.

The need to expand delivery of interventions for improving parental communication with adolescents about sex is exemplified by a recent troubling report. The report cited data from 1988, 1995, and 2002 and showed significant declines in US female adolescents' reports of parent-adolescent communication about contraception and sexually transmitted infections and stable but low reporting by adolescent boys of discussions with parents about contraception.⁷¹ These declines coincided with decreases in adolescent reports of receiving school-based sex education and increases in adolescent birth rates.⁷² Thus, adolescents seem to be experiencing a historic reversal in reproductive health trends while receiving less information about sexual health topics from both parents and schools. Increasing delivery of content via parent-adolescent communication interventions could play a critical role in reducing adverse outcomes among adolescents.

A major challenge in scaling up delivery of parent-adolescent communication interventions is achieving economy of scale. As noted in our review, most existing interventions involve face-to-face facilitated formats. Face-to-face interventions require trained personnel, require significant time

commitments by parents, and have limited reach because few parents can be accommodated per training cycle. Mass media, multimedia, and some of the new social-networking programs may be critical for disseminating these interventions more widely. They are less costly once development costs have been expended, which makes them potentially more affordable and easier to disseminate. Few of the interventions included used mass-media formats, and none of them used small media (eg, Web, text-messaging).

Limitations

When evaluating interventions, it is useful to know not only whether an intervention is effective but to understand what intervention components are most correlated with success. Because we were unable to calculate effect sizes, we cannot state whether more effective studies have specific characteristics or components in common. Moreover, few authors reported whether their sample size was sufficiently powered, which makes it impossible to know whether the findings are truly significant. Each study used different communication measures, often creating them de novo and infrequently providing details about the measures' psychometric properties. Lack of detail about the measures' generalizability or reliability when tested in different populations makes it difficult to compare results across studies. It also means we were unable to determine which communication domains are most strongly affected by parent-targeted interventions.

CONCLUSIONS

Parent-targeted interventions for improving parental communication with adolescents about sex have been well designed and improve multiple facets of family communication. However, communication measures need to be standardized to make it easier to compare the effectiveness of various inter-

ventions. The relative effect of these interventions among mothers and fathers are unknown. Given that parental communication is associated with positive effects on adolescent sexual behavior, these interventions may represent a valuable tool for improving adolescent sexual and reproductive health.

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