

Paternal Influences on Adolescent Sexual Risk Behaviors: A Structured Literature Review

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KEY WORDS

adolescents, fathers, paternal influences, sexual risk behavior

ABBREVIATIONS

MQS—methodologic quality score

STI—sexually transmitted infection

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abstract

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BACKGROUND AND OBJECTIVE: To date, most parent-based research has neglected the role of fathers in shaping adolescent sexual behavior and has focused on mothers. The objective of this study was to conduct a structured review to assess the role of paternal influence on adolescent sexual behavior and to assess the methodological quality of the paternal influence literature related to adolescent sexual behavior.

METHODS: We searched electronic databases: PubMed, PsychINFO, Social Services Abstracts, Family Studies Abstracts, Sociological Abstracts, and the Cumulative Index to Nursing and Allied Health Literature. Studies published between 1980 and 2011 that targeted adolescents 11 to 18 years and focused on paternal parenting processes were included. Methodological quality was assessed by using an 11-item scoring system.

RESULTS: Thirteen articles were identified and reviewed. Findings suggest paternal factors are independently associated with adolescent sexual behavior relative to maternal factors. The most commonly studied paternal influence was emotional qualities of the father-adolescent relationship. Paternal communication about sex was most consistently associated with adolescent sexual behavior, whereas paternal attitudes about sex was least associated. Methodological limitations include a tendency to rely on cross-sectional design, nonprobability sampling methods, and focus on sexual debut versus broader sexual behavior.

CONCLUSIONS: Existing research preliminarily suggests fathers influence the sexual behavior of their adolescent children; however, more rigorous research examining diverse facets of paternal influence on adolescent sexual behavior is needed. We provide recommendations for primary care providers and public health practitioners to better incorporate fathers into interventions designed to reduce adolescent sexual risk behavior. *Pediatrics* 2012;130:e1313–e1325

Adolescence is a developmental stage associated with increased risk-taking behaviors that contribute to negative sexual health outcomes.^{1,2} The 2011 Youth Risk Behavior Survey documented the prevalence of sexual risk behaviors among US high school students. This survey showed that 47% of students in grades 9 to 12 have ever had sexual intercourse and 40% of currently sexually active high school students did not use a condom at their last sexual intercourse,³ indicating that many adolescents are at risk for pregnancy and sexually transmitted infections (STIs), including HIV.

In response to this area of continued concern regarding adolescent sexual risk behaviors, researchers have investigated the role of families in supporting healthy adolescent development.⁴ This research has demonstrated a notable association between positive parent-adolescent relationships and reduced adolescent engagement in sexual risk behaviors.⁵ Specifically, parenting processes such as monitoring and discipline, parent-adolescent communication, and parent-adolescent relationship satisfaction have been associated with adolescents' involvement in sexual risk behaviors and their subsequent sexual and reproductive health outcomes.⁶⁻⁹

Although the importance of parental effects has been well established, most research has focused on how mothers shape adolescent sexual behavior. Numerous studies report associations between specific attributes of the mother-adolescent relationship, such as maternal closeness and support, and positive adolescent behaviors, such as increased contraceptive use, higher abstinence rates, and decreased sexual risk-taking.¹⁰⁻¹² Attributes of mother-adolescent communication, such as greater frequency of communication, openness, and self-disclosure about dating experiences during adolescence,

have been associated with more conservative attitudes among adolescents toward sex and delayed sexual debut.¹²⁻¹⁵

Research has largely concentrated on mothers, in part because mothers have been perceived to be the parent primarily responsible for providing directed education about sexuality.¹⁶ When research has explored paternal influences on adolescent behavior, issues of father absence and economic support have dominated the research.¹⁷⁻¹⁹ Consequently, research on father involvement has tended to conceptualize fathers with a limited perspective. More recently, however, research on fathers has explored the relationship between paternal parenting practices and child development. Evidence increasingly suggests that mothers and fathers independently shape areas of child development, such as academic success²⁰ and peer relationships.²¹ Little is known about how paternal parenting processes are associated with adolescent sexual behavior. This lack of research warrants further attention.

This review examines the relationship between father parenting processes and adolescent sexual behaviors that contribute to pregnancy and STIs, including HIV. We also assess the methodological quality of studies included in this review.

METHODS

Data Sources

A computer-based search of the literature was conducted via 6 databases: PubMed, PsychINFO, Social Services Abstracts, Family Studies Abstracts, Sociological Abstracts, and the Cumulative Index to Nursing and Allied Health Literature. Keywords for adolescent sexual behavior and parenting processes were identified. We used an ancestry approach²² to identify additional studies eligible for inclusion. With this approach, the references of articles identified through the initial computer-based search were examined. For an example of our search strategy, see Fig 1.

Inclusion Criteria

We included studies that (1) were peer-reviewed articles published in English between 1980 and 2011, (2) targeted adolescents 11 to 18 years old residing in the United States, (3) examined adolescent sexual behaviors or reproductive outcomes, and (4) focused on paternal parenting processes. We recognize that the adolescent age range of 11 to 18 years is broad; however, most studies of paternal influences recruit fathers whose children span this range and do not stratify results by adolescent age. We included studies that involved male caregivers who were biological, step, or adoptive fathers, whether they

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(paternal [Title/Abstract]) OR fathers [Title/Abstract]
AND
(adolescents [Title/Abstract] OR youth[Title/Abstract])
AND
("sexual behavior" [Title/Abstract]) OR "sexual risk behavior"[Title/Abstract]) OR "sexual
outcomes"[Title/Abstract])
AND
("1980"[Publication Date] : "2011"[Publication Date])
AND
(English [Language])
```

FIGURE 1

Sample search strategy for PubMed. A full list of the search terms is available from the first author.

resided with their children or not. We also included studies of other male figures, such as uncles or grandfathers, if these men fulfilled a primary male caregiver role. Articles were included only if adolescent sexual behaviors were examined as distinct dependent variables. In addition, we included studies that examined paternal influences on adolescent sexual behaviors and resultant reproductive outcomes, such as unintended pregnancy and STIs, including HIV.²³ We defined paternal influence variables as general parenting processes (eg, monitoring and discipline and parent-adolescent communication). Father-related family structure variables (ie, factors such as employment and absence from the home) were not the focus of the review and were excluded. Because of the focus on identifying independent paternal influences, studies that analyzed parent data in aggregate form without distinguishing paternal and maternal influences were excluded. Studies with positive, negative, or no paternal effects were included.

Data Abstraction

Eligible articles identified in each database were exported to an EndNote library. The following information was abstracted: sample characteristics, paternal variables studied, and adolescent sexual behaviors and reproductive outcomes. Abstracted paternal variables include the following thematic groupings: (1) paternal attitudes about adolescent sexual activity; (2) monitoring and discipline-related behaviors; (3) paternal involvement in their adolescent's life; (4) emotional qualities of the father-adolescent relationship (eg, warmth, closeness, attachment); and (5) father-adolescent communication about sex. Each study's analysis of the association between a paternal influence and an adolescent sexual behavior or outcome was abstracted as a separate finding.

Therefore, a study could contribute multiple findings. In studies where unadjusted and adjusted analyses were reported, only the controlled finding was abstracted. A structured review protocol²⁴ was followed and we created a database of articles that met the inclusion criteria (Fig 2).

Data Synthesis

Given heterogeneity in data available for each paternal influence examined, it was not possible to estimate effect sizes of paternal variables on each area of adolescent sexual behavior. The empirical approaches and variables were too varied to conduct a formal meta-analysis. We report data on 6 adolescent sexual behaviors and 1 reproductive outcome: (1) ever had sex, (2) frequency of sex, (3) number of sexual partners, (4) contraceptive use, (5) frequency of condom use, (6) pregnancy, and (7) a composite measure of adolescent sexual behavior. The outcome "composite measure of sexual behavior" was

created by the study authors to refer to scale constructs reported in studies that measured multiple adolescent sexual behaviors simultaneously. We synthesize findings by 3 types of study design: cross-sectional, longitudinal observation, and longitudinal intervention, with data from the cross-sectional category providing the weakest evidence and data from longitudinal intervention category providing the best evidence of paternal effects.

RESULTS

Thirteen articles examining paternal process variables on adolescent sexual behavior were identified (Table 1). Six studies were cross-sectional, 6 were longitudinal observational (henceforth "longitudinal"), and 1 was a longitudinal intervention study (henceforth "intervention"). The paternal process most frequently examined in the reviewed literature (7 of the 13 studies) was emotional qualities of the father-adolescent

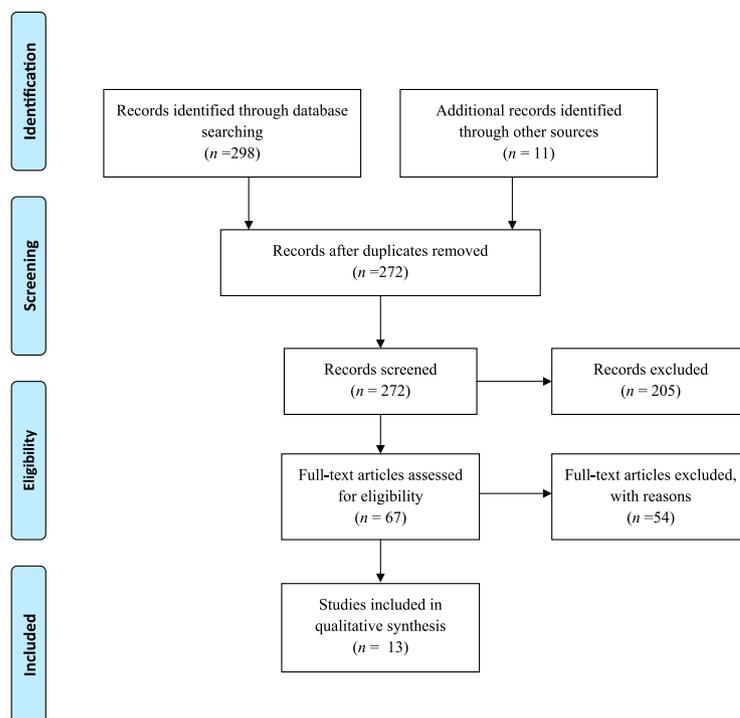


FIGURE 2
Structured review flow diagram.

TABLE 1 Research Design Among Included Studies

Research Design	Distribution of Studies by Research Design	
	Frequency, <i>n</i> (%)	Reference No.
Cross-sectional	6 (46)	25–27, 30, 33, 35
Longitudinal observational	6 (46)	28, 29, 31, 34, 36, 37
Longitudinal intervention	1 (8)	32

relationship. The least examined paternal process variables were paternal involvement and father-adolescent communication about sex (2 of 13). We provide an overview of each hypothesized paternal variable on each adolescent sexual behavior or outcome in the following sections. Additionally, we compare data for father versus mother parenting practices where such comparisons were possible.

Ever Had Sex

Eight of the 13 studies included a measure of adolescent sexual debut. Cross-sectional data were the most common type of data available (Table 2), followed by longitudinal (Table 3) and intervention (Table 4). In general, paternal attitudes toward adolescent sexual behavior were significantly associated with adolescent sexual debut. Only cross-sectional data showed that paternal approval of adolescent sexual activity was associated with earlier sexual debut, whereas paternal disapproval was associated with delayed sexual debut.^{25,26} Cross-sectional data also supported a curvilinear relationship between both low or high levels of paternal discipline and earlier adolescent sexual debut.²⁷ For emotional qualities of the father-adolescent relationship, findings varied by type of study design. Longitudinal studies found positive emotional qualities of the father-adolescent relationship, such as higher levels of connectedness or closeness, were significantly associated with delayed sexual debut.^{28,29} Conversely, cross-sectional data demonstrate negative emotional quali-

ties were associated with earlier sexual debut. For example, 1 qualitative study found poor father-adolescent relationship quality was associated with the onset of sexual activity among teenage mothers³⁰; however, prospective data provided less support for this relationship. For example, although paternal closeness³¹ and connectedness²⁹ were significantly associated with delayed sexual debut at baseline, only paternal closeness was associated with delayed sexual debut for daughters 1 year later.³¹ Mixed findings were also observed for paternal involvement. Longitudinal data suggest that paternal shared activities were negatively associated with adolescent sexual debut at baseline, with no significant association observed prospectively.³¹ Higher levels of problem-focused interactions, however, were a form of paternal involvement positively associated with adolescent sexual debut both concurrently and prospectively.³¹ For the influence of paternal communication, intervention data from 1 study only are available. A father-son HIV prevention intervention (REAL men) showed higher levels of paternal communication about sex were associated with increased rates of adolescent abstinence.³² This association, however, was observed at the 6-month postintervention time point only, limiting the generalizability of the finding.

Taken together, 8 studies documented a significant relationship between the hypothesized paternal processes: attitudes about sex,^{25,26} monitoring and discipline,²⁷ emotional qualities of the

father-adolescent relationship,^{28–31} involvement,³¹ and communication on adolescent sexual debut.³² However, the vast majority of these studies relied on cross-sectional design, therefore providing only limited correlational evidence of paternal relevance.

Frequency of Sex

Our review yielded no support for the statistically significant association between paternal variables and adolescent frequency of sex; however, cross-sectional data from 1 study that examined the association between monitoring and discipline (ie, paternal strictness) and adolescent frequency of sex were available for this outcome (Table 2).³³ Given the paucity of research, it is premature to make conclusions about the ability of paternal variables to influence frequency of sexual intercourse in youth.

Number of Sexual Partners

Cross-sectional and longitudinal data were available for the adolescent outcome number of lifetime sexual partners (Tables 2 and 3).^{33,34} Cross-sectional data indicate paternal monitoring and discipline (ie, paternal strictness) was unrelated to adolescent number of sexual partners,³³ whereas longitudinal data demonstrate some emotional qualities of the father-adolescent relationship (ie, paternal self-restraint) were associated with the reduced number of adolescent sexual partners 4 years later.³⁴ These studies provide some evidence to support the association between paternal monitoring and discipline and quality of the father-adolescent relationship on adolescent number of sexual partners, but the evidence derives from somewhat weak designs.

Contraceptive Use

Both cross-sectional and intervention data were available for the outcome of

TABLE 2 Cross-Sectional Studies Examining Father Influences on Adolescent Sexual Behaviors and Reproductive Health Outcomes

Sexual Behavior Results	Paternal Influence(s)	Sample	Age, y/Grade	Citation
Ever had sex				
Ever had sexual intercourse (+)	↑Approval of adolescent sexual behavior	n = 329 adolescents	13–18	Baker et al 1998 ²⁵
Ever had sexual intercourse (NS)	↑Tolerance of different adolescent sexual activities	(n = 164 males; n = 165 females)		
Ever had sexual intercourse (NS)	↑Approval of social activities without adult supervision	90.4% white, 4.3% black, 2.4% Asian, 2.7% other n = 184 fathers n = 286 mothers		
Sexual activity (+) ^a	↓Relationship quality	n = 10 adolescent females African American and white; percentages not reported	16–19	Burns 2008 ³⁰
Sexual debut (-) ^b	↓Approval of adolescent sexual behavior	n = 454 adolescents (n = 236 males; n = 218 females) 100% African American Subsample of adolescents from a larger study of 751 adolescents	14–17	Dittus et al 1997 ²⁶
Ever had sexual intercourse (+)	↓Control (U-shaped function)	n = 2423 adolescents (63% females; 37% males) 76% white; 15% Hispanic; 9% Other	14–19 30% 15 or younger 42% 16 30% 17 or older	Miller et al 1986 ²⁷
Frequency of sex				
Frequency of sex (NS) ^c	↑Paternal strictness	n = 200 adolescent males 100% black	11–19 (M = 15.12 y; SD = 1.33 y)	Jemmott & Jemmott 1992 ³³
No. of sexual partners				
No. of sexual partners (NS) ^c	↑Paternal strictness	n = 200 adolescent males 100% black	11–19 (M = 15.12 y; SD = 1.33 y)	Jemmott & Jemmott 1992 ³³
Contraceptive use				
Contraceptive use at first sex (NS)	↑Approval of adolescent sexual behavior	n = 329 adolescents	13–18	Baker et al 1988 ²⁵
Contraceptive use at first sex (+)	↑Tolerance of different adolescent sexual activities	(n = 164 males; n = 165 females)		
Contraceptive use at first sex (NS)	↑Approval of social activities without adult supervision	90.4% white, 4.3% black, 2.4% Asian, 2.7% other		
Contraceptive use at last sex (NS)	↑Approval of adolescent sexual behavior	n = 184 fathers		
Contraceptive use at last sex (NS)	↑Tolerance of different adolescent sexual activities	n = 286 mothers		
Contraceptive use at last sex (NS)	↑Approval of social activities without adult supervision			
Frequency of condom use				
Frequency of condom use (NS) ^d	↑Paternal strictness	n = 200 adolescent males 100% black	11–19 (M = 15.12 y; SD = 1.33 y)	Jemmott & Jemmott 1992 ³³
Pregnancy				
Son causing a pregnancy (NS) ^d	↑Paternal strictness	n = 200 adolescent males 100% black	11–19 (M = 15.12 y; SD = 1.33 y)	Jemmott & Jemmott 1992 ³³

TABLE 2 Continued

Sexual Behavior Results	Paternal Influence(s)	Sample	Age, y/Grade	Citation
Composite measure of adolescent sexual behavior				
Younger adolescents' frequency of sexual behavior (NS)	↑Attachment	n = 157 adolescents	Grades 9–12	Somers & Paulson 2000 ³⁵
Older adolescents' frequency of sexual behavior (–) ^e		(n = 62 males; n = 95 females)	14–18	
Younger and older adolescents' frequency of sexual behavior (NS) ^d	↑Warmth	Majority white (87.3%)	(M = 16.2 y)	
Younger and older adolescents' frequency of sexual behavior (NS) ^d	↑Closeness			
Younger adolescents' frequency of sexual behavior (–) ^f	↓Communication about sex			
Older adolescents' frequency of sexual behavior (+) ^f	↑Communication about sex			

Significant effects were reported at $P < .05$; M, mean; NS, no significant association; SD, standard deviation; SE, standard error; (+), significant positive association; (–), significant negative association. Arrows indicate the higher or lower levels of the paternal influence variable.

^a Qualitative study.

^b Father effect was significant above and beyond significant maternal effect.

^c Father effect was nonsignificant in the context of significant maternal effect.

^d Indicates father effect was nonsignificant in the context of nonsignificant maternal effect.

^e Father effect was significant in the context of nonsignificant maternal effect.

^f Father effect was significant in context of significant maternal effect.

adolescent contraceptive use (Tables 2 and 4). We observed mixed findings for the association of paternal variables on adolescent contraceptive use. For example, only some paternal attitudes toward adolescent sexual activity (ie, paternal tolerance of adolescent sexual behavior), were statistically associated with contraceptive use, whereas paternal attitudes of approval of adolescent sexual behavior and approval of teenage social activities without adult supervision were unrelated.²⁵ Intervention data from 1 study showed there was a positive association between paternal communication and adolescent contraceptive use at the 12-month postintervention time point only.³² These results provide weak support for the association between paternal attitudes toward adolescent sexual behavior and paternal communication about sex on adolescent contraceptive use.

Frequency of Condom Use

Our review documented no support for the significant association between paternal influence and adolescent frequency of condom use (Table 2). Specifically, cross-sectional data from 1 study found paternal monitoring and discipline (ie, paternal strictness) was unrelated to frequency of condom use.³³

Pregnancy

Only cross-sectional data from 1 study were available for measuring the association between paternal variables on the outcome of adolescent pregnancy (Table 2). Specifically, no significant relationship was found between paternal monitoring and discipline (ie, paternal strictness) and if a sample of African American adolescent male teenagers reported having ever caused a pregnancy.³³

TABLE 3 Longitudinal Observational Studies Examining Father Influences on Adolescent Sexual Behaviors and Reproductive Health Outcomes

Sexual Behavior Results	Paternal Influence(s)	Sample	Age, y/Grade	Citation
Ever had sex				
Ever had sex at Wave I (+)	↑Problem-focused interactions	<i>n</i> = 10 407 adolescents	Grades 7–12	Ream & Savin-Williams 2005 ³¹
Ever had sex between Wave I and II (+)		(<i>n</i> = 4895 males; <i>n</i> = 5512 females)	M = 15.5 y for males (SE = 0.12 y)	
Ever had sex at Wave I (-)	↑Shared activities	71% white, 13% black, 10% Latino, 4% Asian, and 2% other	M = 15.4 y for females (SE = 0.12 y)	
		Subsample from Waves I and II of Add Health		
Ever had sex between Wave I and II (NS)	↑Closeness			Regnerus & Luchies 2006 ²⁸
Ever had sex at Wave I (-)		<i>n</i> = 2368 adolescents	Grades 7–12	
Ever had sex between Wave I and II for daughters (-) and sons (NS)	↑Relationship quality	(48.9% males; 51.1% females)	15–19	
Ever had sex between Wave I and II for daughters (-) and sons (NS) ^b		65.2% white, 18.4% Hispanic, 9.7% African American, 8.7% Asian	(M = 15.97; SD = 0.94)	
Ever had sex controlling for opportunities for first sex between Wave I and II for daughters (NS) ^b and sons (NS) ^b		Subsample from Waves I and II of Add Health		Rink et al 2007 ²⁹
Ever had sex at Wave I (-) ^a	↑Connectedness	<i>n</i> = 3644 adolescent females	15–19	
Ever had sex between Waves I and II (NS) ^b		72.4% white, 26.6% non-white	16.4% 15 y	
Ever had sex by Wave III (NS) ^b		Subsample of unmarried, female adolescents from Waves I, II, and III of Add Health		
No. of sexual partners				
Number of sexual partners 4 y later (NS)	↑Paternal distress	<i>n</i> = 82 adolescent boys	Grade 6	D'Angelo et al 1995 ³⁴
Number of sexual partners 4 y later (-)	↑Paternal self-restraint	<i>n</i> = 60 fathers	Time 1: 11.0–12.6 y; M = 11.4 y Time 2: 15.0–17.1 y; M = 15.8 y	
Composite sexual behavior				
Sexual risk behavior (+)	↓Father-adolescent mutual attachment	<i>n</i> = 296 adolescents	M = 17.2 y for males; M = 17.0 y for females	Brook et al 2010 ³⁷
		<i>n</i> = 296 fathers		
		46% African American, 44% Hispanic, 8% Non-Hispanic Caucasian, 2% others		
Sexual risk behavior (+) ^a	↑Father knowledge of adolescent activities	<i>n</i> = 3206 adolescents and their residential parents	13–18	Coley et al 2009 ³⁶
		(47% females; 53% males)		
		16% African American, 22% Hispanic, 62% European American or other		

Significant effects were reported at $P < .05$; NS, no significant association; (+), significant positive association; (-), significant negative association.

^a Father effect was significant in the context of nonsignificant maternal effect.

^b Indicates father effect was nonsignificant in the context of nonsignificant maternal effect.

TABLE 4 Longitudinal Intervention Studies Examining Father Influences on Adolescent Sexual Behaviors and Reproductive Health Outcomes

Sexual Behavior Results	Paternal Influence(s)	Sample	Age, y	Citation
Ever had sex				
Experimental son ever had sex 3 mo postintervention (NS)	↑Father-son communication about sex (REAL men intervention)	<i>n</i> = 240 adolescent males	11–14	Dilorio et al 2007 ³²
Experimental son ever had sex 6 mo postintervention (–)		<i>n</i> = 240 fathers	(<i>M</i> = 12.8 y; <i>SD</i> = 1.2 y)	
Experimental son ever had sex 12 mo postintervention (NS)		96.1% African American Subsample of father-son dyads from an experimental study of 277 father-adolescents		
Contraceptive use				
Experimental son's condom use 3 mo postintervention (NS)	↑Father-son communication about sex (REAL men intervention)	<i>n</i> = 240 adolescent males	11–14	Dilorio et al 2007 ³²
Experimental son's condom use 6 mo postintervention (NS)		<i>n</i> = 240 fathers	(<i>M</i> = 12.8 y; <i>SD</i> = 1.2 y)	
Experimental son's condom use 12 mo postintervention (+)		96.1% African American Subsample of father-son dyads from an experimental study of 277 father-adolescents		

Significant effects were reported at $P < .05$; NS, no significant association; (+), significant positive association; (–) significant negative association.

Composite Measure of Adolescent Sexual Behavior

Both cross-sectional (Table 2) and longitudinal (Table 3) data were available for the composite measure of adolescent sexual behavior outcome, which across studies included measures of frequency of sex, number of sexual partners, and frequency of contraceptive use/nonuse. For the father variable of paternal communication, only cross-sectional data were available.³⁵ The study found greater paternal communication was associated with increased frequency of sexual behavior among older adolescents.³⁵ In contrast, less paternal communication was associated with decreased frequency of sexual behavior among younger adolescents, suggesting differential results depending on adolescent age. Longitudinal studies suggest both positive father variables related to paternal monitoring and discipline practices (ie, monitoring knowledge)³⁶ and negative father variables, such as poor emotional quality of the father-adolescent relationship (ie, weaker father-adolescent mutual attachment)³⁷ were significantly associated with increased adolescent sexual risk behavior. For example, although paternal

monitoring knowledge was linked to reduced risk behavior at baseline, this association waned and reversed direction over time, potentially because of fathers becoming more aware of their teenager's risky behavior as it increases over time.³⁶ In sum, all 3 studies examining a composite measure of adolescent sexual risk behavior documented a significant relationship with the father-specific variables of paternal communication, paternal monitoring and discipline practices, and emotional qualities of the father-adolescent relationship, although 1 study's use of cross-sectional design and differences in the orientation of the composite scale make it difficult to summarize the relationship between paternal influence and this outcome.

Paternal Versus Maternal Influence

Several studies included both mothers and fathers and simultaneously examined independent associations of each parenting factor on adolescent sexual behavior (see note in Tables 2 and 3). Specifically, 3 cross-sectional and 3 longitudinal studies compared maternal and paternal parenting effects. Included studies used rigorous analysis

techniques, such as canonical correlation,³⁵ multiple regression,^{26,28,29,33} and multilevel growth analysis,³⁶ to evaluate the effect of parental gender as a predictor of adolescent sexual behavior. Cross-sectional studies found paternal communication was associated with changes in adolescent sexual behavior while controlling for maternal communication,³⁵ paternal attachment was associated with decreased older adolescent sexual behavior, whereas maternal attachment was unrelated,³⁵ and paternal disapproval of adolescent behavior delayed adolescent sexual debut slightly beyond the effect of maternal disapproval. Specifically, adolescents with increasing paternal or maternal disapproval, independently, were less likely to ever have sex.²⁶ Paternal monitoring and discipline (ie, paternal strictness), however, was unrelated to adolescent sexual behavior while controlling for maternal strictness.³³ The longitudinal studies found father-daughter relationship quality, connectedness, and father monitoring knowledge influenced adolescent sexual behavior while respective maternal correlates had no effect. Adolescents with higher levels of paternal relationship quality²⁸ or

paternal connectedness²⁹ were less likely to initiate sex 1 year later, whereas maternal relationship attributes were unrelated to sexual debut. Additionally, adolescents in families with higher levels of paternal monitoring knowledge were more likely to engage in sexual activity over time, whereas maternal knowledge was unrelated.³⁶

Methodologic Quality

We characterized and scored each of the studies by using the methodologic quality scoring (MQS) system, which has been validated in previous studies.^{38,39} The MQS is composed of 11 variables and has a possible range of 0 to 20. The frequency distribution for each methodologic criterion is presented in Table 5. By using the guidelines of a previous review,⁴⁰ scores

were grouped to denote low (0–6 score), medium (7–14 score), and high (≥ 15 score) quality studies. Two primary coders independently scored the studies, with an interrater reliability of 0.84. After initial study coding, the first author met with coders to resolve issues of disagreement. Total MQS scores ranged from 7 to 19. By using the MQS classification, most studies were classified as medium quality,^{25–27,30,32–35} 5 studies were high quality,^{28,29,31,36,37} and no studies were low quality (see Table 6).

Reliability/Validity Measures

Reports of reliability and validity measures varied widely among studies. Although many studies included validity (4 studies) or reliability data (8 studies) for the paternal process variable examined, or another variable in the study

(6 studies), only 1 study reported validity or reliability data for both the paternal process variable and at least 1 main outcome variable.³⁶

Theoretical Framework

Nine studies used a theoretical framework to guide study design and analysis. The most commonly cited theory was social control theory,^{28,31–33} followed by family systems²⁹ or interaction theory.^{31,36,37} Other theoretical frameworks used were “the Big 5” domains of adult personality traits³⁴ and ecological systems theory.²⁹ No study used a theoretical framework that was father-specific.

Research Paradigm and Study Design

Most studies used a quantitative research paradigm and nearly half of

TABLE 5 Criteria for Assessing Methodologic Quality and Frequency Distributions for Each Quality Characteristic

Methodologic Characteristic	Scoring Options ^a (Maximum Total Score = 20 Points)	Distribution of Characteristics Among Included Studies	
		Frequency, <i>n</i> (%)	Reference No.
Definition of paternal influence on sexual behavior outcomes	Not reported: 0	1 (8)	30
	Global: 1	0 (0)	—
	Paternal influence domain-specific: 2	12 (92)	25–29 and 31–37
Validity data for paternal variable scores	Not reported: 0	9 (69)	25–29, 31–33, and 35
	Reported: 1	4 (31)	30, 34, 36–37
Reliability data for paternal variable scores	Not reported: 0	5 (38)	27–30 and 33
	Reported: 1	8 (61)	25–26, 31–32, and 34–37
Validity/reliability data for other variables in study	Not reported: 0	7 (53)	25–27, 31, and 33–34, 37
	Reported: 1	6 (46)	28–30, 32, and 35–36
Theoretical framework presented	Did not present: 0	4 (31)	25–26, 30, and 35
	Presented: 1	9 (69)	27–29, 31–34, 36–37
Research paradigm	Quantitative or qualitative: 1	13 (100)	25–37
	Mixed methods: 2	0 (0)	—
Study design	Correlational or cross-sectional: 1	6 (46)	25–27, 30, 33, and 35
	Longitudinal: 2	7 (53)	28–29, 31–32, 34, and 36–37
Sample size	Undetermined: 0	0 (0)	—
	<100: 1	2 (15)	30, 34
	>100 to <300: 2	4 (31)	32–33, 35, and 37
	>300: 3	7 (53)	25–29, 31, and 36
Sample design	Convenience/nonprobability: 0	6 (46)	27, 30, 33–35, and 37
	Random/probability but not nationally representative: 1	3 (23)	25–26 and 32
	Random/probability and nationally representative: 2	4 (31)	28–29, 31, and 36
Data analysis	Qualitative/univariate/descriptive: 1	1 (8)	30
	Bivariate/ANOVA: 2	3 (23)	27, 32, and 34
	Multiple/logistic regression: 3	5 (38)	25–26, 28–29, and 33
	Multivariate: 4	4 (31)	31 and 35–37
	Inappropriate: 0	3 (23)	25, 27, and 34
Appropriate inferences of causality	Appropriate: 1	10 (77)	26, 28–33, and 35–37

^a Scoring Options reflects how many points were allocated for each criteria and were summed to calculate a total MQS score for each study.

TABLE 6 MQSs for Each Study

Study	A	B	C	D	E	F	G	H	I	J	K	MQS Score
Baker et al 1988 ²⁵	2	0	1	0	0	1	1	3	1	3	0	12
Brook et al 2010 ³⁷	2	1	1	0	1	1	2	2	0	4	1	15
Burns 2008 ³⁰	0	1	0	1	0	1	1	1	0	1	1	7
Coley et al 2009 ³⁶	2	1	1	1	1	1	2	3	2	4	1	19
D'Angelo et al 1995 ³⁴	2	1	1	0	1	1	2	1	0	2	0	11
Dilorio et al 2007 ³²	2	0	1	1	1	1	2	2	1	2	1	14
Dittus et al 1997 ²⁶	2	0	1	0	0	1	1	3	1	3	1	13
Jemmott & Jemmott 1992 ⁵³	2	0	0	0	1	1	1	2	0	3	1	11
Miller et al 1986 ²⁷	2	0	0	0	1	1	1	3	0	2	0	10
Ream & Savin-Williams 2005 ³¹	2	0	1	0	1	1	2	3	2	4	1	17
Regnerus & Luchies 2006 ²⁸	2	0	0	1	1	1	2	3	2	3	1	16
Rink et al 2007 ²⁹	2	0	0	1	1	1	2	3	2	3	1	16
Somers & Paulson 2000 ³⁵	2	0	1	1	0	1	1	2	0	4	1	13

A, definition of paternal influence outcomes; B, validity data for paternal influence measures; C, reliability data for paternal influence measures; D, validity and reliability data for other intervention variables; E, theoretical framework; F, research paradigm; G, study design; H, sample size; I, sample design; J, data analysis; K, appropriate inferences of causality.

studies relied on a cross-sectional study design and self-reported survey data. Seven studies collected adolescent reports of perceived paternal influence^{26,28,29,31,33,35,36} and 2 studies collected father self-reports of paternal influence.^{25,34} Three studies collected both paternal and adolescent reports of paternal variables.^{27,32,37} One study used a qualitative research paradigm³⁰ and no study used a mixed-methods approach. More than half of the studies used an observational longitudinal design with at least 2 data-collection time points.^{28,29,31,32,34,36,37} Only 1 study used a longitudinal randomized control trial design.³²

Sample Size and Sampling Methods

Seven studies had large sample sizes ($n > 300$), 4 of which used a randomly selected, nationally representative sample: for example, data collected from a national study such as the National Longitudinal Survey of Adolescent Health.^{28,29,31,36} Most studies with small or medium sample sizes ($n < 300$) used convenience or nonprobability sampling.^{27,30,33–35,37} Authors of 1 study using convenience sampling reported a 50% or less response rate.³⁵ No study reported formal power analysis; however, 1 study was qualitative, and statistical methods such as power analysis do not apply.³⁰

Data Analytic Methods

More than one-third of studies used linear or logistic regression analysis,^{25,26,28,29,33} whereas 3 studies reported using bivariate analysis, such as correlations or *t* tests.^{27,32,34} Four studies used higher-order statistical methods, such as structural equation modeling³⁷ or path analysis.³¹ One study used qualitative analysis and presented no quantitative data.³⁰

Inferences of Causality

Ten studies made appropriate conclusions about their study's findings given its design limitations, whereas 3 did not.^{25,27,34} Studies lacking appropriate inferences of causality did not state main internal threats to study validity (such as cross-sectional design), and/or instead discussed limitations related to the generalizability of the study.

DISCUSSION

Our primary objective was to assess the specific impact of paternal parenting processes on adolescent sexual behavior. Overall, we found a lack of research on the influence of fathers despite the well-documented importance of familial variables in shaping adolescent behavior.^{4,6} Critical paternal process variables apparent in the

literature include paternal attitudes toward adolescent sexual activity, monitoring and discipline, paternal involvement in the life of their adolescent child, emotional qualities of the father-adolescent relationship, and father-adolescent communication about sex.

Our review suggests several plausible paternal mechanisms of import to adolescent sexual behavior and outcomes. The most consistent finding across reviewed studies, including those using both cross-sectional and intervention design, was the significant association between father-adolescent communication and adolescent sexual behaviors such as increased condom use and abstinence from sex.^{32,35} In general, studies suggest that more positive relationship qualities, including higher emotional quality of the father-adolescent relationship and greater paternal involvement, were associated with decreased adolescent sexual risk behavior; however, findings were mixed and likely varied owing to heterogeneity in defined paternal variables. Studies linking paternal attitudes and adolescent behavior were the most inconclusive and relied on cross-sectional designs only. For example, although paternal disapproval of sexual activity was associated with delayed sexual debut, neither paternal tolerance of adolescent sexual activities nor approval of social activities without supervision were significantly related.^{25,26} Paternal monitoring and discipline and adolescent outcomes varied by level of parental regulation and study design. Cross-sectional data indicate paternal strictness was associated with delayed adolescent sexual debut when levels were moderate²⁷; however, lenient and overly restrictive paternal strictness was associated with earlier sexual debut, suggesting a curvilinear relationship with varying levels of monitoring and discipline.^{27,36}

In contrast, longitudinal data demonstrate greater paternal monitoring knowledge was also associated with reduced adolescent sexual risk behavior at baseline; however, this association waned and reversed direction over time.³⁶

Several of the reviewed studies compared the distinct role of mother and father parenting practices on adolescent sexual behavior. Although many studies relied on cross-sectional designs, greater emotional quality of the father-adolescent relationship, paternal communication about sex, and paternal disapproval of adolescent sexual behavior were associated with reduced or delayed adolescent sexual behavior independently of the equivalent maternal variable. Although study design limitations should be considered, these results provide some preliminary evidence to suggest fathers independently shape the sexual behavior of their adolescent children relative to mothers.

The overall methodological quality of the reviewed studies is a major limitation in our ability to make causal inferences about how adolescent exposure to paternal process variables contributes to change in sexual behavior. For example, nearly half of the studies collected data at 1 time point, which reduces the ability to rule out reverse causation. Additionally, no study reported formal power analyses, so it was not possible to assess if sample size was sufficient to fully detect changes in adolescent outcomes. There was also inconsistency in the reporting of psychometric properties of measured variables. Validity data were particularly underreported.

Another notable limitation to our review includes the dearth of father-specific research addressing varied aspects of adolescent sexual behavior. For example, most articles (8 of 13 studies) assessed paternal influence on only 1

area of adolescent sexual behavior: sexual debut. Less emphasis was given to other domains of adolescent sexual behavior, such as frequency of sex (1), number of sexual partners (2), contraceptive use (2), frequency of condom use (1), pregnancy (1), and composite measures of adolescent sexual behavior, including sexual risk-taking (3). For example, a small number of studies report that paternal variables are associated with changes in adolescent contraceptive use and number of sexual partners. The dearth of research in this area, however, limits our understanding of which paternal influences are most influential in modifying these behaviors.

Also important to mention are limitations of our structured review. For example, it is possible our literature search did not yield all relevant studies and our analysis included only peer-reviewed articles, which may introduce publication bias.⁴¹ Additionally, we lacked an adequate number of studies to focus on a specific adolescent developmental period or impose a father residential status requirement. These factors should be considered in future studies. Findings related to which paternal influence was most or least influential to adolescent sexual behavior should be interpreted with care, as the magnitude of each paternal influence was not taken into consideration.

Despite these limitations, our review provides some evidence to support the role of father-specific variables as an important correlate of adolescent sexual behavior. Important to note is although extant research on mothers has developed greatly over the years, the state of mother-specific research on adolescent sexual behavior was once similar to that of fathers. For example, as research on families and mothers has evolved, more complex conceptual models that delineate the

specific mediating mechanisms by which parental process variables shape adolescent behavior have been developed.^{42–44} In contrast, few prevention studies focus on fathers and no reviewed study examined a father-specific theory of influence. A well-defined theoretical framework can inform intervention development by identifying what parenting practices are most amenable to change and likely to yield the biggest impact on adolescent sexual behavior. Although a growing evidence base supports interventions that target parenting practices as a mechanism to decrease sexual risk-taking among adolescents,^{45,46} these programs are likely to focus on mothers and not fathers.⁴⁷ This represents a critical missed opportunity to improve the sexual and reproductive health of adolescents, as fathers are key figures in their children's lives and may parent in ways that differ from mothers. Future intervention development should take advantage of unique paternal influences, as fathers represent an additional opportunity to influence teenage sexual behavior. Greater research adhering to a higher methodological standard should isolate paternal-specific influences by simultaneously evaluating the maternal and paternal process variables examined in this review, as well as other potential mechanisms of father influence. Future research is also needed to identify strategies to best target, recruit, and retain fathers in intervention programs. This research can better inform pediatricians and public health practitioners on how to best involve fathers in interventions to reduce adolescent sexual risk behaviors that lead to unintended pregnancy, STIs, and HIV infection.

CONCLUSIONS

Our review makes clear that fathers have the potential to uniquely influence

adolescent sexual behavior, yet have been overlooked in family-based intervention development. We argue for

greater research to identify potential mechanisms of father-specific influence that will support successful de-

velopment of father-based interventions and expand the opportunity to support adolescent health and well-being.

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