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Mother-Daughter Communication about Sexual Behavior and Reproductive Health in Females with Chronic Health Conditions

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ABSTRACT

Purpose: Females with chronic health conditions (CHCs) engage in risky sexual behavior at least as frequently as their healthy counterparts. Among healthy youth, mother-daughter communication about sexual behavior and reproductive health protects against risky sexual behavior. Yet, little is known about the nature of this type of communication in female adolescents with CHCs or factors that contribute to communication. This study described mother-daughter communication frequency, timing, and comfort and examined the role of demographic/disease factors and maternal outcome expectancy (OE), in contributing variance to mother-daughter communication about risky sexual behavior and reproductive health.

Design and methods: One hundred mother-daughter dyads from outpatient clinics located within a hospital participated. Daughters [ages 14–19; *M*(*SD*) age = 16.28 (1.53)] provided demographic information and mothers self-reported frequency, timing, comfort, and OE of mother-daughter communication about sexual behavior and reproductive health.

Results: Reproductive health topics were discussed with the greatest frequency. Condom and birth control use were discussed less often. Overall, maternal comfort levels were high across topics. Maternal positive OE was associated with all communication domains, accounting for between 11 and 21% of the variance beyond relevant demographic factors.

Conclusions: Fostering positive maternal OE may enhance multiple domains of mother-daughter communication about sexual behavior and reproductive health in samples of female adolescents with various CHCs.

Practice implications: Since mothers with positive OE talk about sexual behavior earlier, more frequently, and with greater comfort; nurses are in a unique position to empower mother-daughter communication about sexual behavior and reproductive health and enhance mother OE during clinical encounters.

Introduction

Risky sexual behavior involves any sexual behavior that increases the likelihood of adverse health outcomes (Centers for Disease Control and Prevention, 2013). Examples include unprotected intercourse, intercourse with multiple partners, or behaviors that increase the risk for human immunodeficiency virus (HIV), sexually transmitted infections (STIs), or unplanned pregnancies (Centers for Disease Control and Prevention, 2010). Adolescents are known to engage in risky sexual behavior (Chandra, Martinez, Mosher, Abma, & Jones, 2005; Klosky et al., 2014; Langille & Curtis, 2002). Parent-adolescent communication about sexual behavior and reproductive health is protective against adolescent risky sexual behavior; however, mothers tend to initiate these conversations more than fathers (Harris, 2015; Miller, Levin, Whitaker, & Xu, 1998; Wilson & Koo, 2010). Specifically, mother-daughter communication tends to be more robust in decreasing risky sexual behavior than other forms of parent-adolescent communication (Miller et al., 1998). Mother-daughter communication about sexual behavior and reproductive health serves as a protective factor such that greater communication frequency is associated with lower rates of STIs and greater contraceptive use in healthy adolescents (Chandra et al., 2005; Deptula, Henry, & Schoney, 2010; Hutchinson, Jemmott, Sweet Jemmott, Braverman, & Fong, 2003; Windman, Choukas-Bradley, Noar, Nesi, & Garrett, 2016). Additionally, communication prior to initiation of sexual activity (i.e., earlier timing of communication) is associated with safer sex practices (e.g., greater condom use) (Miller et al., 1998) as is greater parent comfort with communication about sexual behavior and reproductive health (Whitaker, Miller, May, & Levin, 1999).

Abbreviations: HIV, human immunodeficiency virus; STIs, sexually transmitted infections; CHC(s), chronic health condition(s); OE, outcome expectancy; LGBTQ, Lesbian, Gay, Bisexual, Transgender, Queer; DV, dependent variable.

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Less is known about the role of parental communication about sexual behavior or reproductive health in families of adolescent females with chronic health conditions (CHCs). This is problematic since female adolescents with CHCs experience unique health risks associated with sexual behavior including increased susceptibility to STIs if the CHC or its treatment results in immunosuppression and fewer or less efficacious birth control options due to CHC symptoms or treatment (Chambers, Tutuncu, Johnson, & Jones, 2006; Faculty of Family Planning and Reproductive Health Care Effectiveness Unit, 2003; Gawron, Gawron, Kasper, Hammond, & Keefer, 2014; Kane, 2008; Schwarz, Sobota, & Charron-Prochownik, 2010; Tyer-Viola & Palan Lopez, 2014). Moreover, females with CHCs are likely to be sexually active, with some studies suggesting rates of risky sexual behaviors in this group as similar to or higher than those of healthy adolescents (Klosky et al., 2014; Loomba, Aggarwal, & Pelech, 2015; Nylander, Seidel, & Tindberg, 2013; Schwarz et al., 2010; Suris, Resnick, Cassuto, & Blum, 1996). Female adolescents with CHCs may also have fewer protective factors in place to decrease the likelihood of engaging in risky sexual behavior (Nylander et al., 2013), making them a particularly vulnerable group. The one study that could be identified on the topic indicates that maternal communication about sexual behavior or reproductive health in female adolescents with CHCs occurs infrequently, with only a third of female adolescents with diabetes reporting that they received information about birth control from their parents (Schwarz et al., 2010).

Among healthy adolescents, several demographic factors have been linked with greater frequency of maternal-adolescent communication about sexual behavior and reproductive health including younger maternal age, older adolescent age, higher maternal education level, and mother not residing with a partner (DiIorio et al., 2005; Jerman & Constantine, 2010; Miller & Whitaker, 2001). Furthermore, some research has found ethnic differences in frequency of parent communication about sexual behavior and reproductive health, as well as racial or ethnic differences in maternal comfort in communication (Lefkowitz, Boone, Au, & Sigman, 2003; Lefkowitz, Romo, Corona, Au, & Sigman, 2000; Meneses, Orrell-Valente, Gundelman, Oma, & Irwin, 2006; Swain, Ackerman, & Ackerman, 2006). In addition to demographic factors, maternal positive outcome expectancy (OE; i.e., expectations about the outcome of conversations about sexual behavior having a positive effect) has been positively correlated with mother-daughter communication about sexual behavior in samples of healthy adolescents (DiIorio et al., 2005; Guilamo-Ramos, Jaccard, Dittus, & Collins, 2008). No studies have examined relationships between demographic factors or OE and mother-daughter communication in samples of adolescents with CHCs.

Further examination of these relationships in samples of female adolescents with CHCs is warranted to identify subgroups of families at risk for lower levels of communication who may benefit from intervention. Thus, the current study aimed to 1) describe and examine interrelationships of three specific aspects of mother-daughter communication (frequency, timing, and comfort) about sexual behavior and reproductive health in a sample of females with CHCs; 2) evaluate the role of select demographic or disease factors (type of CHC) in influencing communication; and 3) evaluate the role of maternal OE in explaining additional variance in mother-daughter communication after accounting for relevant demographic and disease factors. We expected that younger mothers, those with higher levels of education, those from a minority racial or ethnic group, and those living without a partner would communicate more frequently about sexual behavior and reproductive health. We also predicted that mothers would communicate more frequently when their daughters were older. Furthermore, we expected that maternal OE would account for significant variance beyond demographic and disease variables, such that more positive OE regarding discussions about sexual behavior and reproductive health would be associated with greater frequency of communication, earlier timing, and greater comfort.

Methods

Participants

One hundred mother-daughter dyads were recruited from select outpatient clinics located within a children's hospital. Adolescent participant inclusion criteria were: 1) female gender, 2) English fluency, 3) age 14–19 years old, 4) diagnosed with a gastrointestinal, cardiac, rheumatological, or pulmonary CHC for at least one year prior to participation, 5) had a female parent/guardian who is available to participate, and 6) had no history of cognitive or developmental disorder that would hinder the participant's ability to complete study questionnaires. Parent inclusion criteria included: 1) female gender; 2) English fluency; and 3) legal guardian if adolescent was a minor. The sample was limited to mother-daughter dyads given literature that has documented differences between mother and father communication about sex with adolescents (Harris, 2015; Miller et al., 1998; Wilson & Koo, 2010) and because mother-daughter communication about sex tends to be more robust in decreasing risky sexual behavior than other forms of parental-adolescent communication (Miller et al., 1998).

Procedure

A member of the research team approached eligible participants at one of the outpatient clinics during a clinic visit. Mother-daughter dyads provided written assent (adolescents younger than 18 years old) or written consent (adolescents 18 years and older and all mothers) prior to initiating study procedures. Due to the sensitive nature of the questionnaires, mothers and daughters completed questionnaires in separate rooms within the clinic. This study was approved by the Institutional Review Board at participating institutions.

Measures

Demographics

Adolescents reported their age and type of CHC using a study-developed form. Mothers self-reported their age, racial/ethnic background, level of education, as well as whether or not they currently resided with a domestic partner. Due to a large percentage of the sample identifying as Caucasian (83%), mother racial/ethnic background was coded dichotomously as 0 = self-identified as Caucasian and 1 = self-identified as belonging to another racial or ethnic group. Maternal living arrangement was dichotomously coded as living with partner or not living with partner.

Mother-daughter communication about sexual behavior and reproductive health

Communication about sexual behavior and reproductive health was assessed via an item set developed by DiIorio and colleagues (DiIorio, Kelley, & Hockenberry-Eaton, 1999; DiIorio, McCarty, & Denzmore, 2006). The item set utilized in the present investigation included 17 discussion topics focused on sexual behavior and reproductive health. For each topic, mothers rated 1) the frequency at which they discussed each topic during the past three months; 2) whether or not they had discussed the topic with their daughter and age first discussed; and 3) their comfort in discussing each topic.

Frequency of mother-daughter communication about each of the 17 topics was rated on a 5-point scale ranging from 1 (not at all) to 5 (a lot). A frequency total score was computed by averaging ratings across the 17-items, such that higher scores indicated more frequent communication. Internal consistency for the communication frequency total score was high in the current sample ($\alpha = 0.97$).

Timing of communication was coded as either “on time” or “off time” for each of the 17 items. Based on established scoring strategies, “on time” communication was operationalized as mother-daughter communication that occurred prior to onset of sexual activity; whereas

"off time" communication was communication that either occurred after onset of sexual activity or had not occurred at all (Clawson & Reese-Weber, 2003). Any topic that was discussed "off time" was given a score of 1, and a communication timing total score was computed by averaging responses across all 17 items, such that higher scores indicated more off time communication. Internal consistency for the timing subscale was high ($\alpha = 0.92$).

Mother comfort in communicating about each of the 17 topics was rated on a 5-point Likert scale ranging from 1 (very uncomfortable) to 5 (very comfortable) (DiIorio et al., 1999). A communication comfort total score was computed by averaging ratings across the 17 items, such that higher scores indicated greater comfort with communication. Internal consistency for the total score was high in the present sample ($\alpha = 0.96$).

Maternal OE

Maternal OE was assessed via the 23-item DiIorio's OE Scale (DiIorio et al., 2001, 2005). Each item (e.g., "if I talk to my teen about sex topics, I will feel like a responsible parent") was rated on a scale of 1 (strongly disagree) to 5 (strongly agree). An OE total score was computed by averaging responses across all 23-items. Several items were reverse coded prior to computation of the total score so that higher scores indicated more positive OE. Internal consistency for this scale was high ($\alpha = 0.86$).

Data analytic plan

Analyses were carried out using IBM SPSS version 24. Descriptive analyses were conducted to summarize demographic variables. Skewness and kurtosis were examined for continuous independent and dependent variables to ensure the normality assumption was met for parametric analyses. During preliminary analyses, the total communication comfort score was found to violate the assumption of normality; however, an inverse transformation was successful in restoring normality. No other variables required transformations. When appropriate, homoscedasticity and multicollinearity analyses were also conducted and revealed no issues.

For aim 1, descriptive analyses were used to examine frequency, timing, and comfort in maternal communication about sexual behavior and reproductive health. For aim 2, bivariate correlations were used to examine associations of continuous demographic variables with mother-daughter communication frequency, timing, and comfort. One Way ANOVAs were used to examine differences in each of the three communication variables as a function of categorical demographic or disease factors. To evaluate aim 3, three forward entry multiple regressions were conducted to examine the role of maternal OE in explaining additional variance in mother-daughter communication beyond the impact of demographic or disease factors. Demographic or disease factors that were significantly correlated with frequency, timing, and comfort in bivariate analyses were considered for entry in the regression, as was maternal OE.

Results

Participant demographics

The sample consisted of 100 mother-daughter dyads. *M*(*SD*) mother age and daughter age was 45.13 (6.45) and 16.28 (1.53) years old, respectively. Daughters reported the following CHCs: 33% Gastrointestinal; 24% Cardiac, 21% Rheumatologic, 13% Pulmonary, and 9% had more than one CHC. About 25% of adolescents reported being sexually active with ages ranging from 15 to 19 years old, *M*(*SD*) age = 17.38 (1.17). Table 1 includes additional demographic information about the sample.

Table 1
Participant demographic information ($N = 100$).

Variable	*M*(*SD*)	Range	*N* (Percentage)
Female adolescent			
Age	16.28 (1.53)	14.00–19.00	
Race/Ethnicity			
Caucasian			79.00 (79.00)
African American			8.00 (8.00)
Hispanic			6.00 (6.00)
Biracial			6.00 (6.00)
Other			1.00 (1.00)
Type of CHC			
Gastrointestinal			33.00 (33.30)
Cardiac			24.00 (24.00)
Rheumatologic			21.00 (21.00)
Pulmonary			13.00 (13.00)
More than one CHC			9.00 (9.00)
Sexually active			26.00 (25.20)
Mother			
Age	45.13 (6.45)	30.00–61.00	
Race/Ethnicity			
Caucasian			83.00 (83.00)
African American			7.00 (7.00)
Hispanic			5.00 (5.00)
Biracial			3.00 (3.00)
Other			2.00 (2.00)
Living with partner			76.00 (76.00)
Education			
Less Than High School			4.00 (4.00)
High School/GED			24.00 (24.00)
Partial College			25.00 (25.00)
College or University (BA, BS)			33.00 (33.00)
Graduate or Professional Degree			14.00 (14.00)

CHC: Chronic Health Condition.

Mother-daughter communication about sexual behavior and reproductive health

Items mothers most frequently discussed during the past three months, included the teen's menstrual cycle, what the mother thinks about teenagers having sex, and how the daughter's life would change if she became a mother as a teen. The following topics were discussed least often: birth control, condom use, and what the teen's father thinks about teens having sex. Regarding timing of communication, the following three topics were discussed most often prior to the onset of sexual activity: daughter's menstrual cycle (98% of dyads discussed prior to onset of sexual activity), maternal views on teenagers having sex (86% of dyads discussed prior to onset of sexual activity), and STIs (80% of dyads discussed prior to onset of sexual activity). The following topics were rarely discussed prior to the onset of sexual activity: what the teen's father thinks about teens having sex (50%), condom use (47%), and birth control (45%). Mothers reported being comfortable discussing the vast majority of topics, as reflected by mean scores of 4 or higher on all items. Table 2 includes information on frequency, timing, and comfort for each topic assessed.

Greater frequency of communication about sexual behavior and reproductive health was associated with greater comfort in communication ($r = 0.36$, $p < .001$) and earlier timing of communication ($r = -0.45$, $p < .001$). Finally, mothers with higher levels of comfort were more likely to talk to their daughter prior to onset of sexual activity ($r = -0.24$, $p = .02$). Table 3 includes intercorrelations of maternal communication frequency, timing, and comfort.

Demographic and disease correlates of maternal-daughter communication

As predicted, more frequent mother-daughter communication occurred when mothers were not living with a partner ($r = -0.26$, $p = .01$) and among mothers from minority racial or ethnic groups ($r = 0.38$, $p < .001$). Contrary to hypotheses, maternal age, maternal

Table 2
Frequency, timing, and comfort of mother-daughter communication about sex and reproductive health.[a]

Variable	Frequency of communication *M*(*SD*)	On time communication *N*	Communication comfort *M*(*SD*)
What you think about teenagers having sex	3.61 (1.37)	86.00	4.49 (0.89)
When to have sexual intercourse	3.29 (1.45)	76.00	4.38 (0.92)
What her father thinks about teenagers having sex	2.40 (1.37)	50.00	4.32 (0.83)
What her friends think about teenagers having sex	2.77 (1.39)	68.00	4.50 (0.76)
How her life would change if she became a mother while a teenager	3.31 (1.49)	77.00	4.58 (0.80)
What the act of sexual intercourse is	2.59 (1.43)	76.00	4.13 (1.00)
Sexually transmitted infections (STIs)	2.91 (1.46)	80.00	4.48 (0.84)
Dangers of multiple sex partners	2.74 (1.53)	64.00	4.45 (0.87)
Benefits of delaying sex until older	3.24 (1.47)	78.00	4.48 (0.88)
How to prevent pregnancy	2.93 (1.55)	75.00	4.45 (0.86)
Her menstrual cycle	3.72 (1.20)	98.00	4.60 (0.72)
Birth control pills	2.44 (1.54)	55.00	4.46 (0.85)
Using a condom during sex	2.42 (1.56)	53.00	4.35 (0.92)
Getting AIDS	2.55 (1.51)	72.00	4.43 (0.81)
Reasons delaying sexual debut	3.15 (1.42)	76.00	4.48 (0.88)
Age it is ok to have sex if you love someone	2.72 (1.47)	59.00	4.41 (0.81)
Assessing if you are ready to have sexual intercourse	2.53 (1.47)	56.00	4.28 (0.95)

[a] Sample sizes ranged from 81 to 100 due to some missing data.

education, and daughter age were not associated with frequency of communication. Demographic factors were also not associated with maternal comfort in communication or timing of communication. No differences in communication frequency (Welch's $F(4,33) = 0.51$, $p = .72$), comfort (Welch's $F(4,34) = 0.19$, $p = .93$), or timing (Welch's $F(4,34) = 0.22$, $p = .93$) were documented between adolescents with different CHCs. See Table 3 for intercorrelations among study variables.

Relationship of maternal OE with mother-daughter communication

Forward regressions were conducted to examine the role of maternal OE in contributing variance to the three aforementioned domains of mother-daughter communication about sexual behavior and reproductive health, after accounting for relevant demographic or disease correlates. With communication frequency as the dependent variable, maternal OE accounted for an additional 20% of the variance in frequency of communication after accounting for the role of mother ethnicity ($t(1,92) = 3.91$, $p < .001$), such that more positive OE was associated with greater frequency of communication, which is consistent with hypothesis. This effect was medium in magnitude. With communication timing as the dependent variable, maternal OE accounted for 11% of the variance in timing of mother daughter communication. None of the demographic variables met criteria to enter the model. As predicted greater positive OE was associated with more on time communication ($R = 0.33$, $F(1,93) = 11.46$, $p = .001$), and the effect was of medium magnitude. Finally, with maternal comfort as the dependent variable, maternal OE accounted for 21% of the variance in mother comfort. None of the demographic variables met criteria to enter the model. As predicted, more positive OE was associated with greater mother comfort in discussing sexual behavior and reproductive health ($R = 0.46$, $F(1, 92) = 25.29$, $p < .001$). See Table 4.

Discussion

This study described patterns of mother-daughter communication about sexual behavior and reproductive health in a sample of female adolescents with CHCs and examined the role of demographic factors, disease factors, and maternal OE in contributing variance to mother-daughter communication. Unique contributions of this study included attention to female adolescents with various CHCs, a group that has been underrepresented in existing literature and an analysis of multiple aspects of mother-daughter communication including frequency, timing, and comfort.

Although the protective role of mother-daughter communication is well substantiated in samples of healthy adolescents (Deptula et al., 2010; Hutchinson et al., 2003; Windman et al., 2016), less research has examined this construct in female adolescents with CHCs. This is a major gap insofar as sexual behavior is associated with unique risks among adolescents with CHCs (Chambers et al., 2006; Faculty of Family Planning and Reproductive Health Care Effectiveness Unit, 2003; Gawron et al., 2014; Kane, 2008; Schwarz et al., 2010; Tyer-Viola & Palan Lopez, 2014). Our findings revealed variability in mother frequency and timing with communication about sexual behavior and reproductive health. Reproductive health topics (e.g., menstrual cycle) were one area in which mothers reported the greatest frequency of discussion and were almost always discussed prior to onset of sexual

Table 3
Correlations between participant demographics and frequency, comfort, and timing.[a]

	Frequency	Comfort	Timing	OE	Mother age	Mother education	Mother living with partner	Mother ethnicity	Adolescent age
Frequency									
Comfort	0.36***								
Timing	−0.45***	−0.24*							
OE	0.33**	0.46***	−0.33**						
Mother age	−0.14	0.11	−0.05	−0.05					
Mother education	−0.16	−0.11	−0.11	0.04	0.23*				
Mother living with partner	−0.26**	−0.15	0.11	−0.21*	0.08	−0.19			
Mother ethnicity	0.38***	0.08	−0.01	0.14	−0.36***	−0.30**	−0.31**		
Adolescent age	0.06	0.05	−0.16	0.06	0.26**	0.83	0.06	−0.16	

* $p < .05$.
** $p < .01$.
*** $p < .001$.
[a] Sample sizes ranged from 96 to 100 due to missing data.

Table 4
Forward regression examining relationships between domains of mother-daughter communication and mother outcome expectancy.[a]

	β	t	r_{sp}	R	F	R^2
DV: Communication Frequency						
Model 1				0.38	15.27***	0.14
Mother Ethnicity	1.18	3.91	0.14			
Model 2						
Mother Ethnicity	1.06	3.56	0.12	0.45	6.89*	0.20
Outcome Expectancy	0.69	2.62	0.05			
DV: Communication Timing						
Model 1						
Outcome Expectancy	−3.93	−3.39		0.33	11.46**	0.11
DV: Communication Comfort						
Model 1						
Outcome Expectancy	0.28	5.03		0.46	25.29***	0.21

DV: Dependent Variable.
* $p < .05$.
** $p < .01$.
*** $p < .001$.
[a] Sample sizes ranged from 95 to 98 due to random missing data.

activity. Other topics that mothers generally felt comfortable discussing and discussed earlier, included their opinions about their daughters being sexually active and the implications of pregnancy for their daughter's life. Mothers reported infrequently discussing condom use and birth control. This is problematic given that parent discussions about condom use are predictive of future use in adolescents (Miller et al., 1998). Our findings related to greater frequency of communication about reproductive health and less frequent communication about condom use is consistent with prior literature on parents of healthy adolescents (Jerman & Constantine, 2010).

The current study also yielded information about the role of select correlates of mother-daughter communication, including demographic factors and OE. Although several demographic factors were related to communication frequency (i.e., presence of a partner in the home, and mother race/ethnicity), none were associated with communication timing or comfort. Moreover, no differences in mother-daughter communication frequency, timing, or comfort were evident between different CHCs. Taken together, these results suggest a limited role of demographic or disease factors in contributing to differences in communication and instead, point to the importance of maternal OE as a correlate of mother-daughter communication. After accounting for relevant demographic factors, OE accounted for a significant amount of variance in all three communication domains (frequency, timing, and comfort). This is consistent with the research on communication frequency of mothers of healthy adolescents (DiIorio et al., 2005; Guilamo-Ramos et al., 2008). Our findings appear to be the first, however, to document the importance of OE on multiple domains of communication about sex in female adolescents with CHCs within the same study. Given that literature has found a positive relationship between mother OE and frequency of communication in healthy adolescents; the results of the current study add to the importance of targeted interventions towards enhancing mother positive OE in mothers of adolescents with CHCs as a means of increasing mother-daughter communication about sexual behavior and reproductive health (DiIorio et al., 2005).

Study limitations and future directions

There are several limitations to the current study that may serve as avenues for future research. First, although a diverse set of CHCs were represented, the majority of participants identified as Caucasian. Since female adolescents who identify as part of a racial or ethnic minority group may engage in riskier sexual behaviors (Kann et al., 2016; Pflieger, Cook, Niccolai, & Connell, 2013), future studies should target this subgroup. Further, the current study did not collect data on participant cultural or religious beliefs, which may impact parent-adolescent communication about sexual behavior and reproductive health (Regnerus, 2005). Attention to these factors may be of value in future studies. In addition, the current design was cross sectional, which limits the ability to make causal inferences about the role of OE in explaining communication patterns. Importantly, this study also utilized a definition of sexual behavior that was limited to heterosexual intercourse. Although a notable limitation, this was also the first study to examine multiple domains of mother-daughter communication about sexual behavior and reproductive health in female adolescents with CHCs. Yet, to enhance generalizability, future research that incorporates female adolescents that have a CHC and also identify as part of the LGBTQ community is an important next step, as is research that uses a broader definition of sexual activity. In fact, research indicates that adolescents that identify as LGBTQ are receiving inadequate education about sex from their parents (Goldfarb, Lieberman, Kwiatkowski, & Santos, 2018), and as such, they constitute a high-risk group. Additionally, the current study did not examine how mother-daughter communication impacts daughter sexual behavior. Attention to this relationship may be of value in future studies. Finally, given the sensitive nature of the study, it is possible that participants felt reluctant to answer honestly, and the extent to which responses were influenced by a social desirability bias is not known. Several steps were taken, however, to encourage honesty in responding, including having mothers and daughters complete questionnaires in separate rooms, which may have helped reduce social desirability biases and increase comfort with honest reporting (Richman, Kiesler, Weisband, & Drasgow, 1999). It is worth noting, however that sexual behavior is a difficult topic to measure. (McCallum & Peterson, 2012; Meston, Heiman, Trapnell, & Paulhus, 1998; Richman et al., 1999).

Clinical implications

Current findings that communication between mother-daughter dyads about sexual and reproductive health was suboptimal highlight an important role for health professional intervention. Specifically, healthcare providers treating female adolescents with CHCs should prioritize discussions about risky sexual behavior with the adolescents and work to empower parents to communicate about this regularly. Indeed, research shows that more healthcare provider discussions about sexual behavior and reproductive health are warranted (Alexander et al., 2013). Nurses with specialties in adolescent medicine have unique training in discussing sexual behavior and reproductive health with adolescents (Santa Maria, Guilamo-Ramos, Sweet Jemmott, Derouin, & Villarruel, 2017) and may be particularly well suited to initiate such discussions and to provide parent training. Including discussions about sexual behavior and reproductive health in the context of medical appointments prior to adolescents with CHCs transitioning to adult care may be helpful given that this population lacks knowledge on safe sex practices even in adulthood (Boyle, Farukhi, & Nosky, 2001; Nixon, Glazner, Martin, & Sawyer, 2003; Siklosi, Gallagher, & McKine, 2010). Additionally, the development of interventions that target the mother's OE may enhance domains of mother-daughter communication about sex. Although not yet studied among parents of female adolescents with CHCs, parent-focused interventions to enhance communication frequency and comfort have been successful in reducing rates of sexual behavior in groups of healthy adolescents when delivered in the context of routine medical appointments by healthcare providers (Akers, Holland, & Bost, 2011; Guilamo-Ramos, Bouris, Gonzalez, McCoy, & Aranda, 2011). Future extension of such interventions to families of female adolescents with CHCs may be beneficial and is an area for exploration.

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Declaration of interest

The authors have no conflicts of interest to disclose.

CRediT authorship contribution statement

Jessica P. Naftaly: Conceptualization, Writing - original draft, Writing - review & editing, Formal analysis. **Rachel N. Greenley:** Supervision, Methodology, Writing - review & editing.

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Data statement

Due to the sensitive nature of topics in this study, participants were informed that raw data would be kept confidential.

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