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Does parental monitoring moderate the relation between parent–child communication and pre-coital sexual behaviours among urban, minority early adolescents?

Diane Santa Maria*, Christine Markham, Paul Swank, Elizabeth Baumler, Sheryl McCurdy and Susan Tortolero

Center for Health Promotion & Prevention Research, University of Texas School of Public Health, Houston, TX, USA

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This study examined parental monitoring (PM) as a potential moderator of the relation between parent–child communication (PCC) and pre-coital sexual behaviours (PCSB) in an urban, minority, early adolescent population. Seventh-grade students ($n = 1609$) reported PCC, PM and PCSB. Multivariable logistic regression was conducted to assess for moderation. PM moderated the association between PCC and PCSB. Specifically, young people reporting both high PCC and high PM had the lowest odds of PCSB. Findings suggest that PCC is more protective in combination with high PM. However, young people reporting low levels of PM had an increased probability of PCSB with higher levels of PCC. No moderating effect between PCC, PM and PCSB was found by race/ethnicity or gender. However, race/ethnicity was found to moderate the effect of PCC on PCSB. This knowledge highlights the protective role of parental factors on PCSB and may inform the development of more effective parent-based adolescent sexual health interventions that address both PCC and PM.

Keywords: parent–child communication; parental monitoring; coital behaviour; young people; USA

Introduction

Minority ethnic young people are at significant risk of early sexual debut, which may have both immediate and long-term health consequences (Eaton et al. 2012). It is associated with inconsistent use and non-use of contraceptives and is a risk factor for sexually transmitted infection and teenage pregnancy (Magnusson, Masho, and Lapane 2012). Initiation of pre-coital behaviours such as kissing and genital touching is a documented antecedent to sexual debut. One nationally representative study reported that 18% of 12–14-year-olds had experienced genital touching; however, this sample dates back to 1996. Little research has been conducted to examine the prevalence of pre-coital behaviours in early adolescents, particularly in minority ethnic youth who are at greater risk of early sexual debut (Eaton et al. 2012). One study found that African-American youth have a higher prevalence of pre-coital as well as coital behaviours than Whites. Forste and Haas (2002) found that across race/ethnicity, males who postponed intercourse engaged in fewer pre-coital sexual behaviours (PCSB), indicating that postponing pre-coital behaviours may lead to delayed sexual debut.

Parents play a pivotal role in reducing adolescent sexual risk behaviours including early sexual debut through parent–child communication (PCC), parental monitoring (PM)

*Corresponding author. Email: diane.m.santamaria@uth.tmc.edu

and family dynamics (Kirby, Lepore, and Ryan 2005; Turnbull 2011). Theoretical models such as the parent-based expansion of the theory of planned behaviour and Burrus et al.'s (2012) analytic framework demonstrate the influence of parental factors, such as communication and monitoring, on adolescent sexual behaviours and factors that influence parental communication behaviours. Turnbull, van Wersch, and van Schaik (2011, 2008) also point out the complex determinants of parent–child sexual health communication. Although PCC and its influence on adolescent sexual intercourse have been widely studied, the evidence regarding its impact is mixed. Some studies have found that parent–child sexual health communication is associated with decreased sexual risk behaviours in adolescents. Some studies have found no correlation between communication and sexual behaviours. Still others have found a negative correlation (Chen and Thompson 2007). These mixed results may demonstrate a gap in knowledge related to the construct of PCC, how it is measured and the pathway via which it affects sexual behaviours among young people. For instance, cross-sectional studies may find that communication is higher in youth who are sexually active whereas it is low in youth who are non-sexually active. This may reflect an increase in communication in response to an increased parental awareness of sexual development and/or sexual activity in youth. Longitudinal studies have found that $>50\%$ of youth engage in sexual activity prior to parent–child sexual health communication and that communication often happens simultaneously with genital touching. There is limited research on the effects of PCC on pre-coital sexual activity in minority early adolescents. One longitudinal study reported that as PCC decreased, there was an increase in moderate pre-coital behaviours (laying together) across race/ethnicity. Huebner and Howell (2003) found that minority ethnic youth reporting low PCC were more likely to engage in sexual risk behaviours than like-aged white youth.

PM has also been demonstrated to have a mixed influence on adolescent sexual risk behaviours. In a nationally representative sample, increases in PM were associated with decreased sexual risk behaviours and continued monitoring between ages 14 and 16 mitigated other risk behaviours up to age 23. However, minority ethnic youth were less likely to score high on PM and were also more likely to report sexual initiation before age 14. In contrast, several studies have found that across race/ethnicity, young adolescents who report higher levels of PM also report fewer sexual risk and problem behaviours. Additionally, one study found that PM predicted sexual abstinence in African-American and Hispanic adolescents after adjusting for age, gender, parental education and income, and family structure. Previous studies of the effects of family structure on adolescent sexual behaviour are mixed, pointing to the need for further investigation, particularly in minority populations with high prevalence of single-parent households.

Evidence suggests that PM may be the most important parental asset in predicting abstinence across race/ethnicity. Monitoring, a function of parental knowledge and child disclosure, is enhanced when PCC is open and engaged. Studies have found a positive combined effect of high monitoring and high communication on minority youth drug use and individual effects of each construct when controlling for the other. Specifically, PM has been shown to moderate the effect of family sexual communication quality on sexual behaviours in African-American adolescents in psychiatric care. However, it is not clear whether this finding holds for young people in the general population.

Tharp and Noonan (2012) suggest that parental communication may be insufficient to reduce risk, but that in combination with PM may have greater influence on youth risk-taking behaviours. In turn, PCC may be an influential and critical factor for effective monitoring. The efficacy of PM clearly benefits from parental knowledge, primarily

gained through child disclosure, which may be affected by the level of open and honest communication between a parent and child. Yet, PCC may also be more effective at decreasing and delaying PCSB when coupled with effective PM.

No studies to date have examined PM as a moderator of the relation between PCC and PCSB in a population of early adolescent minority ethnic youth. In this study, we examined the moderating relation between PCC, PM and PCSB among a seventh-grade minority population, while controlling for age and family structure. In addition, since previous studies have found racial/ethnic and gender differences in PCC and PM, we examined whether or not this moderating relation varied as a function of race/ethnicity or gender.

Methods

We conducted cross-sectional analyses to examine the relation between PCC, PM and adolescent PCSB. We examined three questions: (1) What is the prevalence of PCSB in early adolescent minority youth? (2) Does PM moderate the relation between PCC and early adolescent PCSB? and (3) Does this relation differ by race/ethnicity and gender?

Participants

Data were collected during the baseline survey for a randomised controlled trial conducted in 15 public middle schools in a large, urban south-central US school district to evaluate the efficacy of two sexual education interventions. Research staff recruited participants during elective classes. Parental consent and adolescent assent were obtained. Surveys were conducted using audio computer-assisted self-interview due to the sensitive nature of the questions. The study was approved by the Institutional Review Boards at the University of Texas Health Science Center and the US Centers for Disease Control and Prevention.

Measures

Pre-coital sexual behaviours

Two items measured the dependent variable, PCSB: self-report of touching another person's private parts or having your private parts touched by another person. Response options were yes or no. A variable labelled 'any pre-coital behaviour' was created with 0 = no if participants answered 'no' to both questions and 1 = yes if they answered 'yes' to either question.

Parent–child communication

The seven-item scale used to measure PCC has been previously studied in minority youth. A three-point numerical rating scale was used to measure students' perception of PCC frequency on six sexual topics with response options of 0 = 'we've never talked about it', 1 = 'we've talked about it once or twice' and 2 = 'we've talked about it lots of times'. Scores across items were averaged to create a PCC total score ranging from 0 to 2. Higher scores indicated more perceived communication on sexual topics between parent and child. The scale demonstrated good internal consistency (Cronbach's alpha = 0.87).

Parental monitoring

The five-item scale used to measure PM was developed and previously used with urban youth by Brown et al. (1993). Participants used a four-point numerical scale to rate their

perception of the amount their parents knew about their friends and their whereabouts. Response options were 0 = 'don't know', 1 = 'knows a little', 2 = 'knows a moderate amount' and 3 = 'knows a lot'. Scores were averaged to create a PM total score. Higher scores indicated greater perception of PM. The scale demonstrated good internal consistency (Cronbach's alpha = 0.83).

Baseline data were collected on demographic variables: age, gender, race/ethnicity and family structure, all recognised antecedents of sexual behaviour. Race/ethnicity was coded as African-American, Hispanic and other, which comprised a small group of self-reported Caucasian, Asian, Pacific Islander, Native American and mixed-race youth. Family structure was coded as living with one or two biological parents, a biological parent and step-parent, relative, or non-relative.

Data analysis

Descriptive analyses were conducted to assess relations between the variables. Principal axes factor analyses were conducted to assess the dimensionality of PCC and PM scales. Linear regression was used to analyse the relation between the demographic variables, PCC and PM. Logistic regression was conducted to determine the relation between the independent variables and covariates with PCSB and to test whether the relation between PCC and PCSB depended upon PM and whether that relation differed by race/ethnicity and gender. Main effects were analysed for PCC, PM, race/ethnicity, gender, age and family structure. Significant findings were further examined using simple effects tests. Interaction terms were computed by multiplying PCC scores by PM scores. To test for moderation, a three-way interaction was analysed for PCC × PM by race/ethnicity and gender, while controlling for family structure and age. Effects tests were conducted on significant interactions. All two-way interactions were included in the model as well. Likelihood ratio (LR) tests were used to compare the overall interaction by race/ethnicity and gender for the individual categories. STATA 12.0 was used for all analyses.

Results

Participants

Data were collected from 1725 seventh graders (aged 11–13 years). Students with missing data on the dependent variable, independent variables or covariates were dropped ($n = 133$) for a total analytical sample of $n = 1609$. Subjects with missing data were more likely to be African-American, male, older than 12 years of age and to report a family structure other than living with one or two biological parents. However, there was no significant difference regarding PCSB (32% vs. 33%).

The majority of the sample was between 12 and 13 years old and lived with one or both biological parents. The sample was predominantly female and minority, comprising African-American and Hispanic students (Table 1).

Factor analysis

Principal axis factoring method was used to evaluate dimensionality of the PCC and PM scales, retaining eigenvalues (EV) > 1 and coefficients > 0.40. PCC items asked adolescents to report the amount of communication between parent and child on various sexual health topics. A single factor was retained for PCC (variance = 3.61) accounting for 82% of the total reliable variance. All PCC items had coefficients of > 0.62 and were retained on the factor.

Table 1. Descriptive statistics of the relation between demographic variables and PCC, PM and PCSB.

	Total *n* (%)	PCC *M* (SD)	PM *M* (SD)	PCSB *N* (%)
Age				
12 years	781 (49)	1.05 (0.59)	2.11 (0.77)	208 (27)
> 12 years	828 (51)	1.10 (0.59)	1.94 (0.82)	324 (39)
Gender				
Male	635 (39)	1.05 (0.59)	1.94 (0.79)	261 (41)
Female	974 (61)	1.18 (0.60)	2.07 (0.81)	271 (28)
Race/ethnicity				
African-American	611 (38)	1.27 (0.59)	2.10 (0.79)	264 (43)
Hispanic	804 (50)	1.02 (0.59)	1.96 (0.81)	195 (24)
Other[a]	194 (12)	1.10 (0.59)	2.03 (0.80)	73 (38)
Family structure				
Lives with one parent	747 (46)	1.16 (0.61)	2.02 (0.80)	280 (37)
Lives with two parents	459 (29)	1.05 (0.59)	2.15 (0.74)	117 (25)
Other[b]	403 (25)	1.16 (0.59)	1.90 (0.84)	135 (33)

Notes: *M*, mean; SD, standard deviation.
[a] Caucasian, Asian/Pacific Islander, American Indian/Native American or multi-racial.
[b] Lives with one biological parent and step-parent or non-relative.

Scores across items were averaged to create a PCC total score. PM items assessed adolescent perceptions of parental knowledge, an important aspect of PM. A single factor was retained for PM (variance = 2.46), accounting for 88% of the total reliable variance. All PM items had coefficients of >0.53 and were retained on the factor. Scores across items were averaged to create a PM total score.

Prevalence of PCSB

Table 1 reports variable means, Table 2 reports inferential statistics and Table 3 reports final model analyses. PCSB was reported in 33% of the total sample with males (41%) being significantly more likely to report PCSB than females (28%). Significant differences in PCSB were found by family structure with young people in one-parent households and from other family structures reporting more PCSB than young people in two-parent households. Significant differences were also seen by race/ethnicity with African-Americans reporting more PCSB. PCSB also differed significantly by age with older youth reporting more PCSB.

Parent–child communication

Older children, those from one-parent or other households, females and African-Americans reported higher scores for PCC. Young people from two-parent households reported the lowest scores on communication (1.05 vs. 1.16 for one-parent and other family structures). Scores on PCC varied significantly by gender with more females (52%) than males (37%) reporting high levels of communication. Significant differences were also found between African-Americans and Hispanics ($B = -0.24$; SE of $B = 0.03$; 95% confidence interval (CI) of $B = -0.30, -0.18$, respectively) with African-Americans reporting higher levels of communication (Table 2).

Table 2. Univariable regressions examining relations between PCSB, PCC, PM and demographic characteristics.

	PCSB[a]				PCC[b]			PM[b]		
Variable	PE	SE	OR	95% CI	β	SE	95% CI	β	SE	95% CI
Gender	−0.59	0.11	0.55*	(0.45, 0.68)	0.14*	0.03	(0.08, 0.20)	0.12*	0.04	(0.04, 0.20)
Family structure										
Lives with one parent	0.17	0.13	1.19	(0.93, 1.54)	0.00	0.04	(−0.07, 0.07)	0.14*	0.05	(0.04, 0.24)
Lives with two parents	−0.39	0.15	0.68*	(0.51, 0.91)	−0.10*	0.04	(−0.18, −0.02)	0.27*	0.05	(0.16, 0.37)
Age	−0.57	0.11	0.56*	(0.46, 0.67)	−0.08*	0.03	(−0.14, −0.02)	0.17*	0.04	(0.09, 0.25)
Race/ethnicity										
African-American	0.23	0.17	1.26	(0.91, 1.56)	0.16*	0.05	(0.07, 0.26)	0.07	0.07	(−0.06, 0.20)
Hispanic	−0.63	0.17	0.53*	(0.38, 0.74)	−0.08	0.05	(−0.17, 0.02)	−0.07	0.06	(−0.19, 0.06)

Notes: *$p < 0.05$; [a]logistic regression: OR, odds ratio between African-Americans, Hispanics and others and the difference between lives with one- or two-parent and other family structures; PE, parameter estimate; SE, standard error of the parameter estimate; 95% CI of the odds ratio. [b]linear regression: PE, parameter estimate; SE, standard error of the parameter estimate; 95% CI of the parameter estimate.

Table 3. The model examining the moderating relation between PCC, PM and PCSB in the whole sample.

Variable	PE	SE	OR	95% CI
Gender	−0.62	0.12	0.54*	(0.43, 0.67)
Family structure				
Living with one parent	0.29	0.14	1.34*	(1.02, 1.77)
Living with two parents	0.12	0.17	1.13	(0.82, 1.57)
Age	−0.43	0.12	0.65*	(0.52, 0.82)
Race/ethnicity				
African-American	0.25	0.42	1.28	(0.90, 1.83)
Hispanic	−0.74	0.40	0.47*	(0.33, 0.68)
PCC	0.84	0.14	2.33*	(1.43, 3.78)
PM	−0.44	0.37	0.64*	(0.49, 0.85)
PCC × PM	−0.29	0.12	0.75*	(0.60, 0.94)

Notes: $*p < 0.05$; logistic regression. OR, odds ratio between African-Americans, Hispanics and others and the difference between lives with one- or two-parent and other family structures; PE, parameter estimate; SE, standard error of the parameter estimate; 95% CI of the odds ratio.

Parental monitoring

Scores on PM varied significantly by gender with more young women (16%) than young men (10%) reporting high levels of PM. Significant differences were also seen by age with 12-year-olds reporting higher scores ($M = 2.11$) on PM than those >12 years ($M = 1.94$). A significant race/ethnicity difference was found with African-Americans reporting higher scores on monitoring than Hispanics and youth of other race/ethnicity. Differences were also noted by family structure with two-parent households ($M = 2.15$) reporting more PM than one-parent or other family structures.

Relationship between PCC, PM and PCSB

No significant relation was found between PCC and PCSB when controlling for covariates. However, there was a significant relation between PM and PCSB when controlling for covariates such that higher monitoring was associated with lower reports of PCSB. PCC was significantly related to PM ($r^2 = 0.12$, $F\ (1, 1607) = 214.98$, $p < 0.01$). Higher scores on PCC were associated with higher scores on PM. Therefore, the conditions for a possible moderation were present (Baron and Kenny 1986).

Multivariable logistic regression analyses

Parent–child communication × parental monitoring

We tested whether PM moderated the relation between PCC and PCSB (Table 3). Results indicate that the interaction between PCC and PM was significant when controlling for covariates, suggesting that the relation between PCC and PCSB depends on the level of PM in the study sample as a whole (Figure 1). The graph depicts data for African-American 12-year-old boys from one-parent households. The odds of PCSB were lowest in youth who had both high PM and high PCC. Because no three-way interaction between PCC, PM and race/ethnicity, age, gender or family structure was found, the relation of the graph only differs by the probability of PCSB, not the direction of the relation, when considering Hispanic youth, older youth, girls or young people from two-parent households. For example, Hispanics and girls would only differ by having lower

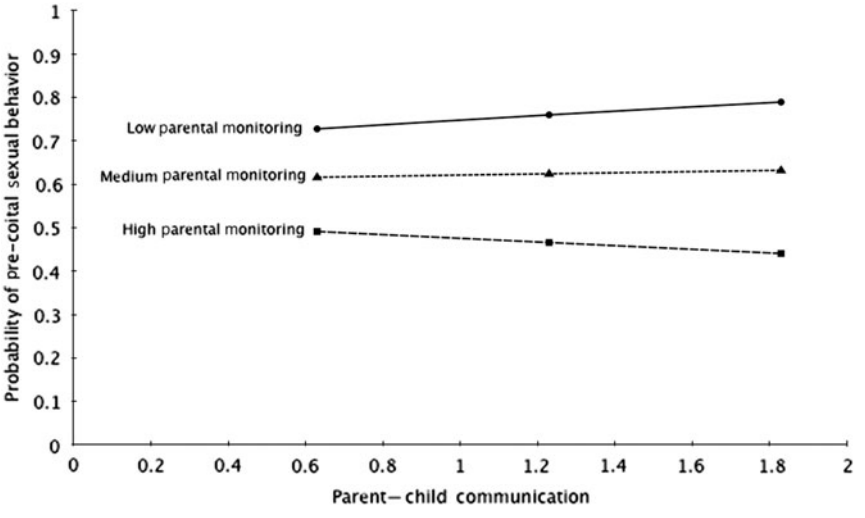

Figure 1. Interaction between PCC, PM and PCSB for entire sample. Note: Graph depicts low, medium and high levels of PM.

probability of PCSB; however, the same directional relation would hold for both subgroups as seen for boys. Similarly, young people from two-parent households would have lower levels of PCSB but maintain the same directional relation.

PCC × PM by gender

There was no moderating effect of gender on the relations between PCC, PM or their interactions and PCSB. The relation between PCC, PM and PCSB did not differ by gender nor did the interaction term PCC × PM × gender (OR = 0.83; $p = 0.41$; 95% CI 0.52, 1.31).

PCC × PM by race/ethnicity

Because race/ethnicity was analysed using three categories (African-American, Hispanic and other), we performed a LR test to compare the overall interaction for the individual categories. The LR test was not significant (LR χ^2 (2) = 0.55, $p > 0.7605$), indicating that the relation between PCC, PM and PCSB does not differ by race/ethnicity. However, there was a significant two-way interaction between PCC and race/ethnicity with odds of PCSB being greater at higher levels of communication, particularly for young people identified as 'other' (Figure 2).

The covariates included in the final model were age, family structure, gender and race/ethnicity (Table 4). There was a significant relation between age and PCSB. The odds of PCSB for the 12-year-olds were 0.64 of the odds for those who were over 12 years old (39% vs. 27%). Although family structure did not significantly contribute to the model using an omnibus test, it was retained in the final model because there was a significant pair-wise difference. This was between young people living with one-parent versus young people living in other family structures (OR = 0.88; $p = 0.36$; 95% CI 0.66, 1.17) but not between one-parent and two-parent households. The odds of PCSB were 1.37 times more for young people living in one-parent households than for young people living in other

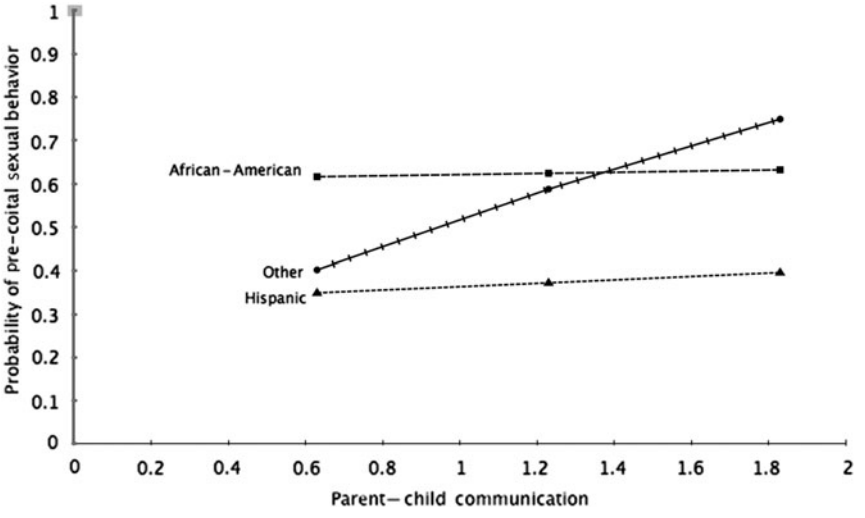

Figure 2. The relation between PCC and race/ethnicity on PCSB. Note: Graph depicts African-American 12-year-old males from one-parent households.

family structures. Gender was significant in the final model with the odds of PCSB being 0.64 times less in girls than boys. There were significant pair-wise differences in PCSB by race/ethnicity with African-Americans having a five-fold increase in the odds of PCSB over youth from other racial/ethnic groups. The adjusted odds ratios of PCSB did not differ between Hispanics and young people from other racial/ethnic groups.

Discussion

This study examined the prevalence of PCSB among early adolescent minority youth and demonstrated a moderating relation between PM and PCC on PCSB. Previous

Table 4. The final model examining the moderating relation between PCC, PM and PCSB containing PCC × race/ethnicity interaction term.

Variable	PE	SE	OR	95% CI
Gender	−0.62	0.12	0.54*	(0.43, 0.68)
Family structure				
Living with one parent	0.32	0.14	1.37*	(1.04, 1.81)
Living with two parents	0.18	0.17	1.20	(0.86, 1.67)
Age	−0.45	0.12	0.64*	(0.51, 0.80)
Race/ethnicity				
African-American	1.60	0.42	5.0*	(0.16, 0.57)
Hispanic	0.44	0.40	1.55	(0.71, 3.4)
PCC	1.81	0.14	6.10*	(2.96, 12.51)
PM	−0.46	0.37	0.63*	(0.48, 0.84)
PCC × PM	−0.28	0.12	0.75*	(0.59, 0.95)
PCC × Race/ethnicity				
African-American	−1.18	0.32	0.31*	(0.17, 0.57)
Hispanic	−1.10	0.32	0.34*	(0.18, 0.64)

Notes: $*p < 0.05$; logistic regression. OR, odds ratio between African-Americans, Hispanics and others, and the difference between lives with one- or two-parent and other family structures; PE, parameter estimate; SE, standard error of the parameter estimate; 95% CI of the odds ratio.

studies support the moderating effect of PM on the relation between PCC and PCSB. This study expands on that by examining the relation in a minority population, determining the nature of the relation among different race/ethnicities and gender, exploring the relation in an early adolescent population and demonstrating the effect of this relation on PCSB.

Findings from this study indicate that the prevalence of PCSB varied significantly by gender, race/ethnicity and family structure, with African-American boys and young people from one-parent households having the highest prevalence of PCSB. Although few studies have reported prevalence of PCSB, a nationally representative study using The National Longitudinal Study of Adolescent Health (Add Health) 1995 data found a prevalence of PCSB of 18% among 12–14-year-olds with no significant gender differences. However, they did find significant racial/ethnic differences in PCSB between African-Americans (26%) and Hispanics (18%). Similarly, other studies have found higher prevalence of PCSB in African-Americans than Hispanics or whites. The overall prevalence of PCSB found in this study (33%) may be higher than in previous studies due to the sample being predominantly low-income, minority ethnic students from single-parent households. Additionally, because of the heterogeneity of the 'other' family structure group, results should be interpreted with caution.

Findings from this study supported previous research findings that higher monitoring was associated with lower reports of PCSB when controlling for covariates, and found gender differences in levels of PCC and PM with girls reporting greater communication and monitoring than boys. A recent literature review of 24 studies found that monitoring may be more protective against sexual risk behaviours in boys than girls, whereas parental warmth and emotional connection may be more important protective factors for girls. Additionally, girls perceive themselves to be monitored more than boys. This led us to hypothesise that there may be a gender difference in the moderation relation between these factors. Yet, this study found no gender difference in the moderating relation between PCC, PM and PCSB in a predominantly minority seventh-grade population. Therefore, the way in which parental communication and PM affect PCSB may not differ by gender.

Previous studies have found racial and ethnic differences in PCC and PM. Specifically, African-American youth report less communication and monitoring than white and Latino youth. We found no difference in the interaction between PCC, PM and PCSB by race/ethnicity. However, we did find a difference in the relation of PCC to PCSB by race/ethnicity, though much of that difference was driven by the heterogeneous 'other' group and should therefore be interpreted with caution (Figure 2).

We found that the odds of PCSB were lowest in young people who had both high PM and high PCC. It is possible that communication is higher in families with young people who are already experiencing PCSB (reactive communication) as many youth become sexually active prior to parent–child sexual health communication. When there are lower levels of PM in families with high-risk youth, the young people may be at greater odds of sexual activity than when the levels of monitoring are high.

These findings highlight the importance of considering multiple parental factors and their interactions when developing adolescent sexual health interventions. Correlates of PCSB among early adolescents may be related in different ways. For instance, PCC may be reactive versus proactive, with young people perceiving an increase in PCC or parents increasing the frequency and topics of sexual health communication in response to signs of current or imminent adolescent sexual activity. Additionally, young people may drive the sexual health communication that coincides with sexual debut by initiating PCC. While

this study found that PCC is associated with higher odds of PCSB, PM moderates that relation with higher PM being associated with lower odds of PCSB.

When gender, race/ethnicity and age were taken into account, the effect of family structure on the moderation relation was not significant. However, there were significant pair-wise differences in reports of PCSB in young people residing in one- or two-parent households versus other family structures. Previous studies of the effects of family structure on adolescent sexual behaviour are mixed, pointing to the need for further investigation, particularly in minority populations with high prevalence of single-parent households. We found that young people from one-parent households reported higher PCC and PM than youth in other family structures; however, these youth had higher odds of PCSB. It is still unclear whether this communication is happening prior to or after initiation of PCSB. Alternatively, young people in one-parent households may not experience the same protection from PCC as those in two-parent households. Further longitudinal research is needed to explore the temporality of PCC and PCSB.

This study has notable strengths. By controlling for confounding factors such as age, gender and family structure, we were able to examine how the moderating relation between PCC, PM and PCSB operates in a predominately minority population. Findings highlight the importance of enhancing PM as well as PCC. However, due to the small sample size of ethnic and racial groups other than African-Americans and Hispanics, subgroup analysis of those in the 'other' group was not possible though findings indicate higher risk of PCSB in youth identifying as 'other' when PCC was high. Findings from this study support the need for further investigation into the context of parental factors across racial and ethnic minority groups, particularly when considering *pre-coital* sexual behaviours and early adolescent populations.

Study limitations must be taken into consideration. The cross-sectional design does not allow for conclusions of causality or temporality. For instance, this study cannot conclude whether PCC and monitoring led to PCSB or if PCSB led to PCC and monitoring. A longitudinal design would provide more information regarding the order of variable effects. Additionally, this study uses only adolescent self-reported data. Future studies using observational measures and dyadic qualitative reports may capture the contextual information missing from self-report surveys. Items used to measure parental factors may have affected the findings. Consensus is lacking on how to best measure PCC and PM. While this study used the two most commonly measured dimensions of communication (frequency and content), other dimensions (e.g. quality, context, directionality, skills, efficacy and timing) have also been shown to be important factors. Similarly, PM was measured from the child's perception of parental knowledge and did not capture important items such as child disclosure and PM practices (e.g. unsupervised time) also found to be important. Furthermore, although the study controlled for many known confounders, findings may be related to other unmeasured covariates such as socioeconomic status. Finally, findings from this study may only be generalisable to similar minority urban populations.

This study has significant public health and clinical implications despite its limitations. Prevalence data presented here highlight the importance of focusing adolescent sexual health interventions and parent-based intervention on early adolescents, particularly high-risk, minority populations. Findings suggest that the parent-based expansion of the theory of planned behaviour, which takes into consideration the influence of PCC and PM on young people's sexual risk behaviour, may be applicable to minority early adolescent populations (Hutchinson and Wood 2007). Findings also suggest that PCC appears to be most effective when coupled with high PM. Longitudinal studies are needed to examine the context of PCC and determine the differing effects of proactive versus reactive communication. Turnbull

et al. (2008) point out that parent–child sexual health communication depends on parental knowledge, family connectedness, child trust of parents and whether children view their parents as a positive role model. Future studies that gather data of determinants of parent–child sexual health communication may clarify the complex ways in which it influences adolescent sexual behaviour. Additionally, this study underscores the need to examine multiple parental factors that affect adolescent sexual behaviours and their interactive effects. Parent-based adolescent sexual health interventions may be more effective if they provide education and skill building on both parent–child sexual health communication and PM.

Future directions

There are several future directions that would contribute to a better understanding of parental protective factors for adolescent sexual health outcomes. Further investigation into sexual activity disclosure events, e.g. how parents become aware of a child's sexual behaviours, may help us better understand the timing and context of parent–child sexual health communication. Little is known about how parents discover the sexual activity status of their child, either through voluntary or involuntary disclosure. This understanding, whether parent–child sexual health communication is reactive versus proactive, would help clarify the context and effectiveness of communication and monitoring. Additionally, studies that account for various family structures, i.e. living with step-parents or custodial grandparents, may help us to understand how family structure influences communication and monitoring. Finally, parenting practices such as communication and monitoring change as young people age and may be dependent on moderating variables, such as temperament and developmental stage. Considering developmental variables may be highly important when attempting to better understand how parents influence young people's behaviours over time.

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