Leveraging a relationship-based sexual health framework for sexual risk prevention in adolescent men in the United States

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Abstract

Background: Studies link sexual health to lower sexual risk in adolescent women, yet no empirical literature evaluates these associations in adolescent men.

Methods: Data were drawn from a longitudinal cohort study of sexual relationships and sexual behaviour among adolescent men ($n = 72$; 14–16 years) in the US. Participants contributed quarterly partner-specific interviews, from which sexual health information and partnered sexual behaviours were drawn. A multidimensional measure of sexual health was constructed and linked to partnered outcomes, including oral–genital, vaginal and anal sex, condom use, partner concurrency and intimate partner violence. Random intercept, mixed-effects linear, ordinal logistic or binary logistic regression were for analyses. Models controlled for participant age, race/ethnicity and relationship length.

Results: Adolescent men contributed 651 unique partner-specific interviews. A higher sexual health score with partners was significantly associated with more frequent oral–genital and vaginal sex, as well as higher condom use, lower partner concurrency and lower received and perpetuated intimate partner violence.

Conclusion: Positive sexually related experiences in adolescent men contribute to a core of sexual wellbeing, which in turn is linked to lower levels of sexual risk with partners. The present study data support both developmental and public health applications of sexual health, with attention on promoting healthy sexuality as well as risk reduction. Higher sexual health among adolescent men from the US is associated with more frequent condom use, lower partner concurrency and less frequent intimate partner violence. Young men's exercising the skills

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associated with healthy sexuality may also reinforce the skills needed to both enjoy sexuality with partners *and* to avoid adverse sexual outcomes.

Additional keywords:

condom use; intimate partner violence; partner concurrency; sexual behaviour

Introduction

Adolescent and young adult men in the United States (USA) represent a disproportionate share of the adverse outcomes associated with sexual activity – including sexually transmissible infections (STI) and early unintended child bearing – as compared with other age groups.[1] In nationally representative data among 15- to 25-year-old young men in the USA, 1.66% were infected with chlamydia, 0.32% with gonorrhoea and 3.86% with genital herpes.[2] Moreover, 15% of adolescent men father a child before the age of 20 years.[3] Most USA prevention efforts target the *individual* risk behaviours that lead to these outcomes (e.g. delaying sex, condom use),[4] but have had a relatively poor effect on reducing STI and childbearing rates in this population.[5,6] A significant limitation of these models is that they do not account for how the context of a specific *relationship* organises a young man's decisions about sexual behaviour.[7,8]

Many researchers – both in the USA and internationally – are beginning to recognise the potential value of including partnership factors as elements of STI and pregnancy prevention programs. The concept of sexual health is one example of how a relationship-focussed, risk-reduction effort could work.[9–11] Sexual health is an evolving paradigm that broadly and inclusively recognises the different ways in which individual experience sexual wellbeing throughout their lifespan, as well as the effect of these dimensions on people's decisions about how and when to have sex.[12–15] As a result, these elements of sexual wellbeing are important additions to an existing public health focus on primary prevention, as they can be leveraged to help people reduce and avoid risk behaviours, when sex occurs.[9,16,17]

During adolescence, the sexual health framework also importantly emphasises the positive developmental contributions that sexuality provides to adolescent wellbeing in the context of emerging romantic and/or sexual relationships.[7,18] Participating in relationships affords young people the opportunity to learn the different skills associated with expressing and managing sexuality.[19–21] As we describe in more detail below, this 'sexual learning' perspective emphasises these relationship-based skills – such as sexual communication, trust, intimacy and sexual pleasure – as important pieces in helping adolescents to evaluate their readiness for sex, appraise the benefits and risks associated with different types of sex, and proactively use methods to prevent STI and unintended pregnancy.[7,8,16]

Three definitions of sexual health each address integration of healthy sexuality and risk prevention. The World Health Organization (WHO)[13] definessexual health as '…a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence….'.

The Consensus Statement of the National Commission on Adolescent Sexual Health (NCASH) from the USA[22] focuses on the construction of sexual health in *adolescence*: 'sexual health encompasses sexual development and reproductive health, as well as such characteristics as the ability to develop and maintain meaningful interpersonal relationships; appreciate one's own body; interact with both genders in respectful and appropriate ways; and express affection, love, and intimacy in ways consistent with one's own values'. The Consensus Statement additionally comments that all 'intimate relationships' should be 'consensual, non-exploitative, honest, pleasurable, and protected against unintended pregnancy and STDs if any type of intercourse occurs'.

More recently, the Centers for Disease Control and Prevention (CDC)/Health Resources and Services Administration Advisory Committee on HIV, Viral Hepatitis, and STD Prevention and Treatment (CHAC) added that '…Sexual health is a state of well-being in relation to sexuality across the life span…it is an intrinsic element of human health and is based on a positive, equitable, and respectful approach to sexuality, relationships, and reproduction… and includes the ability to understand the benefits, risks, and responsibilities of sexual behavior; the prevention and care of disease and other adverse outcomes; and the possibility of fulfilling sexual relationships'.[23]

Collectively, these definitions suggest that an effective model of sexual risk prevention is intimately tied to experiences with sexuality and romantic/sexual relationships during adolescence. Our prior sexual health work has described a conceptual model of this process for adolescent women,[11,24,25] which we now hypothesise also applies to adolescent men (Fig. 1).

In our model, four domains of normative healthy sexual development – emotional, attitudinal, physical and social – support sexual health during adolescence. Emerging romantic and/or sexual relationships become a primary location where adolescents build their learning in these domains.[21] Between adolescence and adulthood, young men may sequentially participate in several different partnerships.[26] Each of these unique relationships provides a context for him to learn and refine the interpersonal (e.g. communicating needs, balancing emotions, ending unwanted partnerships) and behavioural (e.g. choosing specific sexual behaviours, negotiating condom and contraceptive use) management skills that become necessary pieces in healthy sexuality regulation in adulthood.[19,27] For example, many young men desire intimacy, love and closeness in their romantic relationships,[26,28,29] and these emotional qualities help to inform their readiness for sex, the types of sex they choose with partners and decisions about condom and contraceptive use with specific partners.[18,30,31]

Importantly, the *collective* of these sexual health skills links to the sexual and contraceptive outcomes that occur in a given relationship. In adolescent women, for example, we have shown that higher sexual health is associated with more frequent condom use during vaginal sex, consistent contraception use, absence of STIs, a lower likelihood of sexual coercion, as well as a lower likelihood of a young woman's or her partner's using alcohol or marijuana before sex.[11,24,25,32] Many of these protective effects hold even across concurrent partnerships in adolescent women,[25] emphasising the broader utility of relationship-based

sexual health as a programmatic approach to prevention. We hypothesise that these relationships should also extend to adolescent men. Currently, however, no empirical studies have evaluated the association between sexual health and different sexual outcomes.

Accordingly, the objectives of this study were to examine the influence of a partner-specific measure of sexual health on adolescent men's partner-specific sexual behaviours, including frequency of condom use, relational and sexual concurrency, intimate partner violence as well as sexual coercion.

Methods

Study design and participants

Data were collected as part of a larger longitudinal cohort study of adolescent men's sexual relationships, sexual behaviours and STIs among young men in middle- to late-adolescence. Participants ($n = 72$) were young men recruited through respondent-driven and community-focussed methods in lower- and middle-income areas of Indianapolis, IN, USA associated with high rates of early childbearing and STIs. The average maternal and paternal education levels were 12th grade. Eligibility included being 14–16 years of age, English speaking and being biologically male. Neither sexual experience nor sexual orientation were entry criterion in either study. The majority (99%) of reported partners were female. Recruitment strategies remained the same during the duration of the study. Participant characteristics are presented in Table 1.

At quarterly intervals, the adolescent male participants contributed quantitative partner-specific interview data on their sexual history, the traits associated with specific relationships, their sexual attitudes and the sexual behaviour and contraception that occurred with specific partners. In each interview, participants could provide information on up to five 'partners' – identified by initials or first name – including friends, dating partners, boyfriends and sexual partners. While most studies define 'partner' in the context of previous coital contact, the definition was broadened to include 'personal relationships associated with close physical contact (like having sex, kissing or holding hands) or spending time together'. Such a focus permits understanding of how ongoing relationship-related dynamics affects sexual health and related outcomes for young men, independent of the relatively static status labels (e.g. 'main' or 'casual') that may be associated with these relationships. As described in more detail below, sexual health and the outcomes we hypothesised to be linked to sexual health, were measured for any partner on whom data were available in a given quarter.

Interviews were self-administered by the participant via audio computer-assisted interviewing (ACASI) on study-associated tablets, either in the home of the adolescent, in a mutually acceptable public location (e.g. a public library) or in a research-dedicated space in one of the adolescent primary care clinics. Prior to initiating the interview, study staff reviewed they types of information that would be asked. Study staff were also present nearby to answer any questions and/or troubleshoot technology if needed, but did otherwise not interact with the participant during his entry of information.

In total, participants contributed a total of 651 partner-specific quarterly interviews on which analysis was performed. Thus, the quarterly partner-specific interviews were the unit of analysis for the current study. These interviews represented 77 unique partners during the study; for each individual partner, the median number of interviews contributed was four (range: 1–27). Data collection procedures remained the same throughout the duration of the study. This research was approved by the institutional review board of Indiana University/ Purdue University at Indianapolis. Informed consent was obtained from each participant and permission obtained from a parent or legal guardian.

Measures

Sexual health—We constructed our empirical measure of sexual health in several steps. Guided by our conceptual model (Fig. 1), as well as our own empirical sexual health work among adolescent women,[11,24,25,32] we first identified 11 partner-specific quarterly interview scales (relationship quality, partner meeting needs, emotional intimacy, sexual satisfaction, sexual autonomy, condom use efficacy, sexual safety, partner sexual communication, partner closeness to family, shared sexual decision-making and shared social decision-making) to operationalise the wellbeing domains outlined in the WHO,[33] NCASH[22] and CDC[23] definitions of sexual health. Descriptive and reliability information associated with each scale, as well as associated with the individual items in each scale, are contained in Table 2. Multi-level reliability for all scales was good.[34] Next, we assessed the unidimensionality of our sexual health measure by conducting a confirmatory factor analysis using baseline interview data from each relationship, modelling each scale as an indicator of a single sexual health latent factor. This single model factor fit the data well (chi-square [χ^2] [df] = 95.705 [23], $P < 0.001$; Comparative Fit Index = 0.978, Root Mean Square Error of Approximation [90% CI] = 0.056 [0.033–0.078], and modification indices did not suggest any major measurement or structural alterations. We concluded that the single factor structure of our sexual health approach was sound.

Finally, because of the longitudinal nature of the data, we opted to use a regression based, rather than SEM-based, approach for statistical analysis in the paper. While s.e.m. is capable of handling more than one wave of data, the complicated nested structure (e.g. multiple partnerships within participants over time), we felt a regression approach was a more parsimonious means of examining the data. More detail is given in the statistical procedure section. To use sexual health as a predictor variable in these regression models, we first standardised each scale using Z-transformations to put them on the same measurement metric (e.g. to be able to directly compare a scale with all five-point items with a scale using three-point items). Using these standardised measures, we created a single, additive, partner-specific measure of sexual health to be used as the primary predictor variable in all analyses. This process created one measure for each unique partner in a given quarter; the multi-level reliability for this final measure was good ($\alpha = 0.81$).[34]

Behaviour outcomes—We selected 20 different partner-specific behaviour variables known to be associated with increased risk of STI and pregnancy risk in young men's romantic/sexual relationships. Descriptive statistics associated with these variables are provided in Table 3.

Condom use behaviours were (both measures constructed as a ratio: total number of condom events/total number of sexual events): *condom use during vaginal sex* and *condom use during insertive anal sex*.

Relational concurrency included [both single, three-point items: never, sometimes, often; recoded no/yes (sometimes and often) for analyses]: *had another boyfriend/girlfriend at the same time*, *partner had another boyfriend/girlfriend at the same time*. Sexual concurrency included [both single, three-point items, never, sometimes, often; recoded no/yes (sometimes and often) analyses]: *had sex with other people* and *partner had sex with other people*.

Monitoring behaviours were [all single, four-point items: never, sometimes, seldom, often; recoded no/yes (sometimes, seldom, often) for analyses]: *checked partner's phone to see who s/he called* and *partner checked participant's phone to see who s/he called*.

Intimate partner violence behaviours included [all single, four-point items: never, sometimes, seldom, often; assessed for both participant and partner; recoded no/yes (sometimes, seldom, often) for analyses]: (*I/partner*) *threw something* (*at me/partner*), (*I/partner*) *kicked, hit or punched* (*partner/me*), (*I/partner*) *pushed, shoved or shook* (*partner/me*), (*I/partner*) *slapped* (*me/partner*) *or pulled* (*my/partner's*) *hair*.

Sexual coercion included [all single, three-point item: definitely no, maybe, definitely yes; recoded no/yes (may be and definitely yes) for analyses]: (*partner*) *gave me money for sex* (no/yes), (*partner*) *made me have sex when I didn't want to* (no/yes), (*partner*) *would get mad if (I) didn't want to have sex*, (*partner*) *would break up with (me) if (I) unless (I) had sex*.

In support of public health approaches to sexual health as a means for sexual risk reduction in relationships, we expected that a higher partnership sexual health score would be positively associated with condom use during vaginal sex and during anal sex, and negatively associated with partner concurrency, monitoring and violence, and sexual coercion.

Statistical procedure—Random intercept, two-level (level 1: time; level two: partnerships) mixed-effects linear (for continuous measures) and binary logistic regression (for dichotomous measures) were used to estimate the influence of partner-specific sexual health on partner-specific sexual behaviour outcomes.[35] The mixed-effects model was chosen to adjust estimates both for the repeated interview information contributed on the same partners, as well as for different partnerships contributed by the same participant. In all models, sexual health was used as a continuous predictor such that the corresponding estimate (β for linear regression and odds ratio for logistic regression) presented the change in the outcome variable for each one unit increase in the sexual health score. All models were conducted in Stata, 13.0 (StataCorp, College Station, TX, USA), and additionally controlled for participant age, race/ethnicity and relationship length.

Results

Participant characteristics

Participant characteristics are provided in Table 1. This cohort of young men were ~16 years at study entry, and approximately half of the sample (53.3%) was African American. Approximately half ever reported ever giving oral sex, and one-quarter ever receiving oral sex. Slightly less than half reported they had ever had vaginal sex. Few (12.0%) reported ever having anal sex. Among those reporting past sexual experience, the median age of oral–genital sex was 15 years, and 14 years for vaginal and anal sex. Young men reported three or fewer median lifetime partners for any sexual activity. Approximately one-third of the young men reported experience with alcohol or marijuana; other drug use was noted in less than 10% of the sample. Some type of physical contact (83.1%: 541/651) was reported in the majority of partnered interviews.

Multivariate analyses

As shown in Table 3, a higher partnership sexual health score was associated with a young man's reporting of more frequent condom use during vaginal sex during that quarter (β = 0.18), as well as lower odds of a young man's (OR = 0.18) or his partner's (OR = 0.37) having another boyfriend/girlfriend in that same quarter and lower odds of a young man's or his man's (OR = 0.57) or his partner's (OR = 0.48) having sex with someone else outside the relationship in that same quarter.

A higher partnership sexual health score was associated with lower odds in that quarter of a young man's (OR = 0.18) or his partner's (OR = 0.38) checking the other's phone to see who called, a partner's throwing something at a young man (OR = 0.18), either a young man's or his partner's (OR = 0.26–0.56) hitting, punching or kicking the other, a partner's pushing, shoving or shaking a young man and either a young man's or his partner's (OR = 0.20–0.98) slapping or pulling the hair of the other. Finally, a higher partnership sexual health score in that quarter was associated with lower odds of a partner's being mad if a young man didn't want to have sex (OR = 0.54) or a partner's breaking up with a young man unless he had sex with him (OR = 0.33).

Discussion

Domestic and international public health initiatives underscore both the developmental and the prevention importance of romantic relationships to adolescent sexual health,[7,8] arguing that positive relationship-specific attributes collectively empower young people to manage the risks associated with sexual activity.[16] Existing studies have investigated these associations in young women,[11,24,25,32] but not in young men. Our data address this gap by linking a multidimensional measure of sexual health to different sexual and reproductive behaviours in a cohort of adolescent men. These findings provide support for the idea that, controlling for age, race/ethnicity and relationship length, young men's exercising of the skills associated with healthy sexuality[19] – such as communication, trust and negotiation – also reinforce the skills that teenage males need to both experience, explore and enjoy sexual activity with partners *and* to avoid adverse sexual outcomes while they do so.

From a developmental perspective, our data join an expanding literature noting the significance of sexuality and relationships in adolescent men's lives. Outdated, but still widely prevalent, risk-based gender ideologies typically overemphasise young men's constant quest for sex, while stigmatising their needs for close and intimate relationships.[36] A key contribution of these data is their demonstration that – in a process similar to adolescent women[11,24,25,32] – young men's relationships are multidimensional, with these attributes contributing to a core of sexual wellbeing during this timeframe. In turn, this core empowers adolescent men to enact safer sexual behaviours with partners, to reinforce relational and sexual fidelity and to create intimacy and trust with partners. Such findings support models addressing the possibility of young men's having 'healthy' sex during adolescence.[37,38]

The association between young men's sexual health and partnered behaviours is also relevant from a public health perspective.[15] Recent discussion has called into focus the challenges with the actual practice of implementing sexual health as a framework for primary prevention in the United States.[39] Our data provide support for the feasibility of this approach in adolescent men, showing that key STI- and pregnancy-related indicators, including condom use, relational and sexual concurrency and intimate partner violence, are reduced in association with higher levels of sexual health within a given relationship. This information reinforces the idea that relationship-focussed risk reduction[7,8,40,41] can be operationalised with a set of measures that are relatively simple to collect during a clinical or health education encounter. As we have suggested in prior studies,[24,25] the idea that 'sexual well-being' can be assessed and implemented as a frontline-prevention approach in young people continues to be virtually unaddressed in the literature. Yet, as our data show, contextualising the 'sexual' back in 'relationships' may, in fact, hold the greatest promise for risk reduction in this population.[42]

Limitations

Several limitations regarding the current data should be considered. First, while these data provide a view as to the association of sexual health with partnered sexual outcomes in an urban sample of racially/ethnically diverse young men, additional data will be needed to evaluate our findings in other demographically and geographically balanced samples. We also do not know how sexual health may be associated with risk reduction in adolescent men who choose primarily male sexual partners, or in adolescent men who choose both male and female partners. Many studies note substantial challenges exist in recruiting sufficient numbers of sexual minority youth for studies related to sexual health.[39] Moreover, we were not able to assess the sexual health of participants' partners, precluding an understanding of how sexual health may operate synergistically to impact sexual behaviour(s) in a given relationship. Future research may seek to understand the ways in which dyad members mutually influence each other's sexual health levels, how development in this mutuality affects participation in sexual behaviours over time, as well as the between-relationship characteristics that affects change in sexual health over time. All these data may have implications for the types of interventions that are implemented at different junctures in a given relationship. We also did not assess any bi-directionality between our sexual health construct and the outcomes examined. It is possible that participation in some behaviours

– such as partner concurrency or condom non-use – could negatively affect the traits underlying sexual health. Finally, the larger study from which our data were drawn was not designed specifically to assess the sexual health scale used in this paper. From this perspective, we are unable to formally examine aspects of testing (e.g. face or content validity) that is customary in scale development analysis. It is important to note, however, that the larger study was designed to robustly understand a wide range of sexual wellbeing concepts in young men's relationships. All instruments in this larger study were thoroughly reviewed by clinical, behavioural and psychological experts in adolescent-related fields, and all items were piloted with young men from the population of interest before the study's formal recruitment and data collection stage, including review of items for clarity. Future work that is more narrowly focussed on using this sexual health scale approach in different populations should seek to explicitly evaluate scale validity.

Conclusion

Even within the context of these limitations, the data presented here provide emerging, but promising evidence as to the intersection between adolescent men's relationship experiences with sexual health and the ways in which they choose sexual behaviours, as well as the ways in which they protect themselves and partners from sexual risk. Our data suggest a complementarity, rather than an exclusivity, between developmental and public health perspectives around emerging sexuality; the experience of navigating relationships helps young men strengthen the core set of skills they need to both explore sexuality with partners in a healthy way and to reduce adverse outcomes during this exploration.

Acknowledgements

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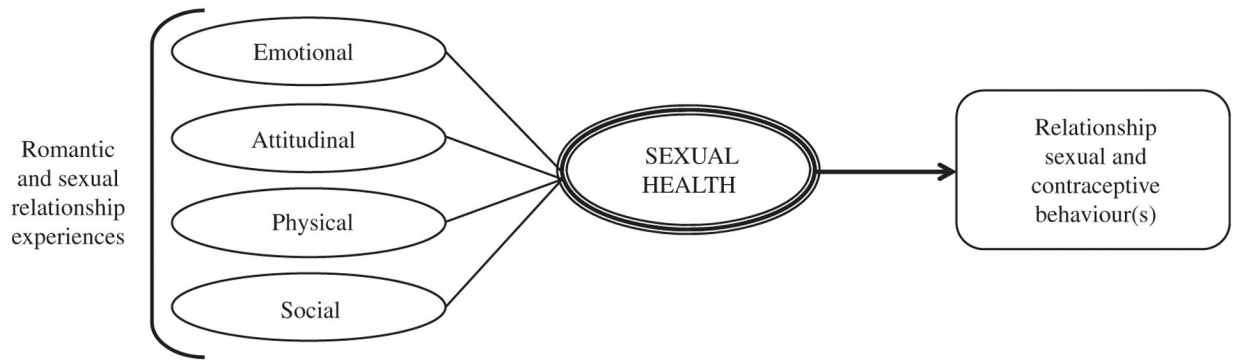
Fig. 1.
Conceptual model of relationship experiences, sexual health and relationship-specific sexual and contraceptive behaviour(s) in adolescent men.

Table 1.

Background characteristics of adolescent men's ($n = 72$)

Characteristic	Descriptive statistic
Age (years; mean, s.d.)	16.1 (1.2)
Race/ethnicity (%)	
African American	53.3
White	25.7
Other	12.0
Maternal education completion (median)	High school
Paternal education completion (median)	High school
Lifetime sexual behaviours (yes: %)	
Ever received oral sex	53.3
Ever gave oral sex	22.7
Ever had vaginal sex	45.3
Ever anal sex	12.0
Age (years) of first sexual experiences (median)	
Receiving oral sex	15
Giving oral sex	15
Vaginal sex	14
Anal sex	14
Lifetime sexual partners (median)	
Vaginal sex	3
Anal sex	1
Vaginal and anal sex	1
Lifetime drug use (yes: %)	
Nicotine	24.4
Alcohol	35.4
Marijuana	36.4
Prescription medication	5.0
Other	6.6

s.d., standard deviation

Table 2.

Descriptive statistics, reliability and World Health Organization (WHO) domain for sexual health scale interview items

Sexual health variables	WHO definition domain	Mean (s.d.)	Average Cronbach's alpha
Relationship quality (all four-point: strongly disagree to strongly agree; range 6–24)	Emotional	12.78 (5.95)	0.956
'I think I understand him/her as a person'		2.28 (1.13)	
'We have a strong emotional relationship'		2.05 (1.06)	
'We enjoy spending time together'		2.25 (1.13)	
'He/she is a very important person in my life'		2.14 (1.10)	
'I think I am in love with him/her'		1.82 (1.01)	
'I feel happy when we are together'		2.25 (1.11)	
Emotional intimacy and trust (all four-point: strongly disagree to strongly agree; range 5–20)	Emotional	8.78 (2.80)	0.780
'My partner cares about me'		1.55 (1.08)	
'I care about my partner'		1.68 (1.05)	
'There are times when my partner cannot be trusted' (reverse)		1.74 (1.01)	
'I would be uncomfortable having intimate conversations with my partner' (reverse)		1.89 (0.92)	
'Sometimes I find it hard to talk about my feelings with my partner' (reverse)		1.91 (0.90)	
Meets needs (all four-point: not at all to completely; range 4–12)	Emotional	6.34 (3.01)	0.829
'How well does your partner meet your sexual needs?'		1.97 (1.14)	
'How well does your partner meet your needs for friendship?'		2.38 (1.20)	
'How committed are you to your partner?'		2.00 (1.14)	
Sexual satisfaction (all seven-point: semantic differential; range 7–35)	Physical	19.27 (8.97)	0.991
'Worthless to valuable'		3.84 (1.83)	
'Very bad to very good'		3.85 (1.83)	
'Very unpleasant to very pleasant'		3.85 (1.82)	
'Very negative to very positive'		3.85 (1.83)	
'Very unsatisfying to very satisfying'		3.89 (1.82)	
Sexual autonomy (all four-point: strongly disagree to strongly agree; range 4–12)	Physical	6.54 (1.58)	0.655
'It's easy for me to say no if I don't want to have sex'		1.67 (1.20)	
'Sometimes things just get out of control with him/her' (reverse)		2.37 (0.83)	
'It's easy for him/her to take advantage of me' (reverse)		2.50 (0.78)	
Condom use efficacy (all four-point: strongly disagree to strongly agree; range 4–20)	Attitudinal	7.65 (5.08)	0.937

Sexual health variables	WHO definition domain	Mean (s.d.)	Average Cronbach's alpha
'It will be easy to use a condom/dental dam if we have sex'		1.63 (1.15)	
'He/she thinks condoms/dental dams are good for protection'		1.64 (1.13)	
'He/she thinks condoms/dental dams are easy to use'		1.58 (1.13)	
'He/she will have a condom/dental dam if we have sex'		1.40 (1.10)	
'I won't have sex with my partner unless we use a condom'		1.40 (1.15)	
Sexual safety (both three-point: no chance to probably; range 1–6)	Attitudinal	1.14 (0.94)	0.887
'What are the chances you'll get a sexually transmitted disease (STD) from your partner in the next 3 months?' (reverse)		0.57 (0.49)	
'What are the chances you'll get your partner pregnant in the next 3 months?' (reverse)		0.43 (0.49)	
Partner knows family (all three-point: don't know each other at all to know each other well; range 3–12)	Social	1.59 (2.22)	0.844
'Indicate how well your partner knows your mother'		0.67 (0.79)	
'Indicate how well your partner knows your father'		0.37 (0.67)	
'Indicate how well your partner knows your grandmother'		0.35 (0.66)	
'Indicate how well your partner knows your grandfather'		0.21 (0.54)	
Shared general decision-making (original all three-point: my partner, both equally, me; recoded: equal (1) or one-sided (0); range 0–4)	Social	2.91 (1.53)	0.882
'Who usually has more say about whose friends you go out with?'		0.70 (0.45)	
'Who usually has more say about what you do together?'		0.74 (0.43)	
'Who usually has more say about how often you see one another?'		0.74 (0.43)	
'Who usually has more say about when you talk about serious things?'		0.71 (0.44)	
Shared sexual decision-making (original all three-point: my partner, both equally, me; recoded: equal (1) or one-sided (0); range 0–3)	Social	1.14 (1.12)	0.753
'Who usually has more say about whether you have sex?'		0.57 (0.56)	
'Who usually has more say about whether you use protection?'		0.72 (0.73)	
'Who usually has more say about what types of sex you have?'		0.48 (0.48)	
Sexual communication (all four-point: strongly disagree to strongly agree; range 4–12)	Social	3.93 (3.12)	0.909
'It is easy to talk to him/her about sex'		1.28 (1.12)	
'It is easy to talk to him/her about condoms'		1.40 (1.14)	
'It is easy to talk to him/her about birth control'		1.25 (1.12)	

s.d., standard deviation

Table 3.

Multivariate linear and binary regression estimates of sexual health score on adolescent men's ($n = 72$) sexual behaviours in partnered interviews ($n = 651$)[A]

Outcome variables	Descriptive statistics	β (SE)[C]	OR (95% CI)[C]
Condom use ratio (mean, s.d.)[A,B]			
Vaginal sex (mean, s.d.)	0.54 (0.46)	0.18 (0.38)**	–
Insertive anal sex (mean, s.d.)	0.54 (0.48)	0.63 (1.37)	–
Relational concurrency (yes: %)			
Had another relationship at the same time?	23.30	–	0.47 (0.28–0.79)**
Partner had another relationship at the same time?	24.40	–	0.37 (0.21–0.63)***
Sexual concurrency (yes: %)			
Had sex with other people?	22.60	–	0.57 (0.36–0.88)**
Partner had sex with other people?	23.00	–	0.48 (0.28–0.84)*
Monitoring and physical violence (yes: %)			
Partner checked phone	12.80	–	0.18 (0.1–0.31)***
Participant checked partner's phone	8.80	–	0.38 (0.21–0.71)**
Partner threw something	10.80	–	0.18 (0.26–0.89)**
Threw something at partner	7.90	–	0.57 (0.29–1.12)
Partner hit, punched or kicked participant	10.70	–	0.26 (0.15–0.45)***
Hit, punched or kicked partner	5.40	–	0.56 (0.30–0.99)*
Partner pushed, shoved or shook participant	8.80	–	0.25 (0.13–0.48)***
Pushed, shoved or shook partner	6.80	–	0.56 (0.29–1.07)
Partner slapped participants or pulled his hair	7.90	–	0.98 (0.85–0.99)*
Slapped or pulled partner's hair	4.60	–	0.20 (0.11–0.77)*
Sexual coercion (yes: %)			
Partner gave money for sex	1.10	–	0.78 (0.58–1.06)
Partner made participant have sex when didn't want to	0.90	–	0.73 (0.23–2.08)
Partner would get mad if participant didn't want to have sex	16.00	–	0.54 (0.31–0.98)*

Outcome variables	Descriptive statistics	β (SE)^C	OR (95% CI)^C
Partner would break up with participant if didn't want to have sex	8.20	–	0.33 (0.20–0.58) ***

SE, standard error; OR, odds ratio; CI, confidence interval; s.d., standard deviation; '–' = variable not measured in that model type;

*
$P < 0.05$;

**
$P < 0.01$;

***
$P < 0.001$

^{A}'Partners' were defined for participants in terms of any close relationship that may or may not have physical contact.

^{B}The ratio of condom-protected events to the total sexual acts reported.

^{C}Adjusted for age, race/ethnicity and relationship length.