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Family and peer support matter for precoital and coital behaviors among adolescents in Lima

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Abstract

We analyzed the association between sub-scales developed with adolescents and the outcomes of precoital behaviors and vaginal sex in Lima, Peru. Adolescent participants in key informant sessions operationalized concepts identified during qualitative concept mapping into several sub-scales. Face and content validity testing and pilot application with respondent debriefing were used to refine the sub-scales. Three hundred 15–17 year olds were surveyed about the sub-scales, socio-demographics and sexual behaviors. Exploratory factor analysis confirmed six sub-scales, self-image, goals and decision-making, family education, parental rules/control, school support and peer support, which we regressed on the outcomes. Twice as many males as females reported more than three precoital behaviors and vaginal sex. Higher peer support reduced the likelihood of vaginal sex and precoital behaviors and higher family education reduced precoital behaviors. Results affirm the importance of including adolescents in the entire research process and of sex education with family- and peer-based strategies.

Keywords

Adolescents; Sexual behaviors; Precoital behaviors; Sexual initiation; Scales; Peru

Introduction

Accurately measuring adolescent sexual behavior and the factors that may influence these behaviors is critical to formulating adolescent health research, programs and policies that are appropriate for adolescents' sexual and reproductive health and general health and development needs. Such information is important and urgent given that the world is now home to 1.2 billion adolescents (Lloyd, Berhman, Stromquist, & Cohen, 2005; United Nations Secretariat, 2012).

This information is also critical for Peru's 5.8 million 10 to 19 year olds (Instituto Nacional de Estadística e Informática, 2010,) particularly considering increasing sexual activity during adolescence accompanied by low sexuality-related knowledge and low use of preventive behaviors. An analysis of the Peru Demographic and Health Survey (DHS/ ENDES) found that the proportion of Peruvian 15–24 year old females reporting ever sex increased from 20% in 1986–1990 to 24% in 1991–1994 and 28% in 1995–1999 (Ali, Cleland, & Shah, 2003). A more recent exploration of the DHS/ENDES for only 15–19 year old females shows a similar increasing trend: from 14% of 15–19 year olds reporting ever sex in 2004–6 to 19% in 2012 (ICF International, 2012). Studies in Lima show that 37–43% of male adolescents and 6–13% of female adolescents are sexually experienced (Cáceres, 1999; Chirinos, Salazar, & Brindis, 2000; Saravia, Apolinario, Morales, Reynoso, & Salinas, 1999; Quintana, 2002).

This sexual activity is accompanied by low sexuality-related knowledge and low condom use. A large school-based study with 13–18 year olds from nine cities in Peru found an index mean for sexual and reproductive health knowledge of 1.8 on a 5-point scale (Magnani, Seiber, Gutierrez, & Vereau, 2001) and a community-based study with 16–17 year olds in Lima showed an average score of 6.3 for males and 6.6 for females on a 16-point scale about knowledge related to pregnancy, contraception and HIV (Cáceres, 1999). In the nine-city study, 38% of sexually-active males and 26% of sexually-active females reported condom use at first sex (Magnani et al, 2001). The community-based study in Lima found higher rates of condom use at first intercourse among sexually-active heterosexual respondents: 26% among males and 33% among females (Cáceres, 1999).

Past quantitative studies in Peru have examined factors that influence adolescent sexuality, including communication with parents about sexuality, peer sexual behaviors, self-esteem, sexual and reproductive health knowledge and gender-role indices (Magnani et al, 2001), as well as participation in sports, time with friends and relatives, risk behaviors, and sexuality-related knowledge, attitudes and experiences (Chirinos et al., 2000). These studies, however, have certain limitations. First, they examine a set of factors that researchers hypothesize as influencing adolescent sexual behavior. Second, they use few scales to measure concepts, despite evidence from the literature that demonstrates the need for multiple items or statements combined into a scale in order to accurately measure theoretical concepts (Netemeyer, Bearden, & Sharma, 2003). Finally, they examine sexual initiation as the main outcome of interest, limiting their ability to explore precoital behaviors.

This study aimed to address these limitations by 1) integrating adolescent perspectives into the decision-making process regarding which factors may influence their sexuality and that of other adolescents, 2) developing sub-scales to measure these factors, and 3) examining the outcomes of both precoital and coital behaviors. First, adolescent perspectives were incorporated by: carrying out extensive qualitative concept mapping activities with adolescents to enable them to identify the factors they perceive to influence adolescent sexuality (results reported elsewhere); implementing key informant sessions and face validity testing with adolescents to transform the factors identified into sub-scales; and validating the sub-scales through a survey with adolescents. Second and regarding precoital behaviors, studies in diverse countries demonstrate a consistent, gradual progression through first crush, first boyfriend/girlfriend, first kiss, and first petting experience, with more rapid progression for males than for females (Lam, Shi, Ho, Stewart, & Fan, 2002; Pinter & Tomori, 2000; Upadhyay, Hindin, & Gultiano, 2006). Additionally, in their study of over 900 adolescents in the U.S. and Puerto Rico, Miller et al found that participants who engaged in a greater number of precoital behaviors were significantly more likely to anticipate having sex in the upcoming year than those who had experienced fewer or no precoital behaviors (Miller et al., 1997). These studies underscore the importance of examining precoital behaviors in order to address the experience of diverse adolescents and possibly predict other behaviors such as sexual initiation.

The objective of the current study was: to analyze the sub-scales developed together with adolescents during key informant sessions and improved during face and content validity testing and a pilot application of the sub-scales with respondent debriefing; and to examine the association between six sub-scales (self-image, goals and decision-making, family education, parental rules/control, school support, peer support) and adolescent experiences of precoital behaviors and vaginal sex.

Methods

Study Setting

This study was conducted in Pampas de San Juan de Miraflores, one of the seven zones in the district of San Juan de Miraflores, which is one of Lima's 43 districts. Pampas' 46 human settlements (*pueblos jóvenes*) are home to 57,000 residents, the majority of whom live in poverty and, in many cases, extreme poverty. Many Pampas households are overcrowded and a significant number lack basic services such as water, electricity and sewage (Municipalidad de San Juan de Miraflores, 2003). This site was selected since it is representative of urban adolescents in Peru. Approximately 70% of Peruvian adolescents live in urban areas and over one-quarter (27%) of the country's adolescents reside in Lima, with the highest proportions of youth living in peripheral areas like Pampas (Ministerio de Salud, 2005). Both in-school and out-of-school youth were included in the study.

Study Participants

A total of 300 15–17 year olds (150 females and 150 males) who reside in Pampas participated. The sample size determination is based on the guidelines of at least 300 subjects to achieve a good-quality factor analysis (Nunnally, 1978; Comrey & Lee, 1992).

Participants were selected from rosters generated in a household census of the area conducted in 1998. An application developed in Visual Fox Pro was used to generate three independent listings of female and male 15, 16 and 17 year olds randomly sampled from the household rosters using a random numbers table. For each age year, study participants were recruited and consented from the first list. If the selected subject was not available or did not consent, the survey team resorted to the second (or third) list to recruit a participant of that age and gender. A total of 165 males and 165 females were selected, to allow for a non-response rate of 10 percent.

All participants provided their assent and their parents/guardians provided their permission prior to commencing data collection. Field workers read the consent form aloud with participants and their parents/guardians and encouraged them to voice any questions or concerns before asking for their signatures. The research protocol and instruments were reviewed and approved by ethical review committees at the Johns Hopkins Bloomberg School of Public Health and AB PRISMA in September 2005 and November 2005, respectively.

Data Collection Activities

Study activities took place from May to September 2006 and consisted of an introductory phase to develop and carry out face and content validity testing of sub-scales, a primary phase to pilot the sub-scales, and a main phase to apply a survey to measure the modified, improved sub-scales, socio-demographic characteristics and precoital and coital behaviors.

Introductory phase

Development of sub-scales—The sub-scales were developed based on the results of extensive qualitative data collection using concept mapping, which includes brainstorming, sorting and ranking, and is described in much greater detail elsewhere (Bayer, Cabrera, Gilman, Hindin & Tsui, 2010). These methodologies resulted in 11 clusters of 61 items that adolescent participants hypothesized were related to adolescent sexuality, including having a girlfriend/boyfriend, engaging in precoital and coital behaviors, and using a condom. Ten adolescents participated in key informant sessions to operationalize the 11 clusters from concept mapping into 12 sub-scales, where each cluster of conceptual items became a sub-scale of those items operationalized into age-appropriate, culturally sensitive survey questions.

The original concept mapping clusters and resulting sub-scales are as follows. The names of the clusters are presented first, followed by the names of the sub-scales in parentheses if the key informant session participants developed a different name for the sub-scale or if they divided the cluster into two sub-scales and subsequently named each one: 1) personal values (self-image); 2) future achievements (being a good student, goals and decision-making); 3) parent-child communication (family education, parental rules / control); 4) negative household influences (same); 5) close environment (peer support, school support); 6) individual thoughts (same); 7–8) mutual agreements between partners and respect and confidence in a partner relationship (partner relationship); 9) low self-esteem (same); and 10) causes and consequences of having sexual intercourse (same). One concept mapping

cluster (tradition) was excluded since key informant session participants felt that the concepts included there were present in the other ten sub-scales. An example of how the adolescents in the key informant sessions operationalized the concepts from the prior concept mapping activities into the questions that made up each sub-scale is shown in Figure 1.

The first author brought examples of other scales to measure similar concepts in adolescent populations and worked with key informant session participants to write items that: (1) have language appropriate for the population's reading level; (2) are short and simple; (3) have no jargon or slang; (4) have no double-barrel statements; and (5) everyone will not immediately endorse. The group also worked to avoid negatively worded items, since they are not as reliable as positively worded items and can be confusing, and to use multichotomous formats like Likert scales since they create greater scale variance (Netemeyer et al., 2003).

Validity testing—Validity testing explored how well the constructs from concept mapping were operationalized into the sub-scales and their respective items. Seven adolescents from the target population assessed face validity and seven experts who work with adolescents in Lima judged content validity. This follows the recommendation of five or more group members to assess the clarity of items and the degree to which they represent their respective domains (Netemeyer et al., 2003).

Primary phase

Pilot of the sub-scales—The sub-scales were first applied in a pilot phase with 100 adolescents from Pampas. This phase also included respondent debriefing interviews with a sub-sample of 10 participants until reaching “saturation,” when no new information emerged from the interviews. The purpose of the interviews was to determine whether respondents understood certain concepts and questions as the research team intended, to explore reasons for misunderstandings, and to engage respondents about the thought process they used to answer the questions (Hughes, 2004). Following the pilot, the sub-scales were modified before moving to the main phase.

Main phase

Survey content—The survey had two components, interviewer-administered and self-administered. The interviewer-administered survey included questions: for the different sub-scales; and about socio-demographic characteristics. Socio-demographics included: age; household wealth, measured by the main floor material in the house (low wealth – dirt floor; middle wealth – cement floor; high wealth – parquet/vinyl floor); and parental structure (both parents or paternal figures; mother or maternal figure only; father or paternal figure only; other structure). The self-administered survey asked the participant about her/his precoital and coital behaviors.

Survey application—For the interviewer-administered component, adolescents from the study community who were about the same age as participants received training in how to interview their peers and in confidentiality issues. Interviewers and respondents were matched for sex and it was ensured that they did not know one another. The interviewer read

the survey aloud to the respondent and the interviewer completed the survey. Both the interviewer and respondent had copies of the survey to facilitate respondent understanding. After the interview, each respondent completed the self-administered survey. These surveys were placed in a sealed envelope that was opened only by the lead field researcher (AMB). Three hundred adolescents from Pampas participated in this phase.

Data Analysis

All analyses were carried out using STATA 11.0. The first step was to conduct exploratory factor analyses (EFA) to 1) reduce the number of items in each sub-scale in order to maximize the sub-scale's reliability and 2) identify the underlying dimensions in each sub-scale (Netemeyer et al., 2003). We evaluated the hypothesized factor structure of each sub-scale using principal components factor analysis (Hair, Anderson, Black, & Tatham, 1998). First, we determined the number of factors in each sub-scale using eigenvalues and scree plots. After rotating the factor solution using oblique, promax rotation (Netemeyer et al., 2003), we analyzed the factor loadings for the scaled variables and eliminated any variables with absolute loadings below 0.40 (Floyd & Widaman, 1995) and over 0.90 (Netemeyer et al., 2003). Then, we tested the internal reliability of each factor using Cronbach's coefficient alpha (Cronbach, 1951). Finally, we generated factor scores for each sub-scale.

The second step was to examine the outcomes of ever vaginal sex and precoital behaviors, as well as other related variables. Ever vaginal sex has possible values of yes or no. Precoital behaviors is comprised of the sum of specific behaviors (hugging, kissing, holding hands, petting above clothing, petting below clothing), with 0 for never experience and 1 for ever experience of each behavior. We used chi-square and Fisher's exact tests in bivariate analyses to examine differences in outcome by socio-demographic factors. For these analyses, ever vaginal sex is dichotomous (0 or 1) and precoital behaviors are dichotomous around the mean of 3.01, with experience of 0–3 versus 4–5 precoital behaviors.

The third step was bivariate and multiple logistic regression analyses using the sub-scales as predictor variables (Grice, 2001). The sub-scales were regressed on the two main outcomes while controlling for the socio-demographic variables. A Cox proportional hazards regression model was carried out for the dichotomous outcome of ever vaginal sex in order to determine what variables potentiate or diminish the hazard rate for experience of vaginal sex. Ordered logistic regression was utilized for the ordered dependent variable of precoital behaviors, as a variable with values 0–5, in order to determine the odds that an individual with a higher score will experience a higher category of precoital behaviors.

Results

Primary phase, pilot results

An equal number of males (50) and females (50) participated in this phase. The pilot survey responses were analyzed by coupling the findings from EFA and respondent debriefing to: 1) modify the content of the sub-scales by removing items that had low factor loadings or low corrected item-to-total or interitem correlations in the factor analyses or items that were poorly understood by participants; or 2) change the wording of certain sub-scale items. An

example of the first case is that “My parent / guardian is too strict” was removed from the family education sub-scale since it had a corrected item-to-total correlation below 0.35 and an interitem correlation less than 0.20. Two other questions, which asked respondents to categorize their family as traditional versus modern or conservative versus liberal, were also removed since participants universally misunderstood these questions in the respondent debriefings. An example of the second case is one of the items in the self-image sub-scale, which was changed from “In certain situations, it’s fine to tell a white lie” to “It’s difficult for me to tell the truth,” based on respondent debriefing feedback.

Main phase

An equal number of males (150) and females (150) participated in the main phase. Participants’ socio-demographic characteristics, overall and by experience of vaginal sex and precoital behaviors, are described in Table 1.

Composition and reliability of sub-scales

The EFA for the main phase confirmed the existence of six sub-scales, out of the originally proposed eleven sub-scales, all of which have good internal consistency reliability (Cronbach’s alpha or α) and items with factor loadings between 0.40 and 0.90. The self-image sub-scale contains 11 items hypothesized to measure general and body-related self-esteem, self-respect, honesty and personal responsibility ($\alpha=0.85$). The goals and decision-making sub-scale contains seven items related to life planning and future aspirations ($\alpha=0.76$). The third sub-scale, family education, includes 13 items that measure trust and communication with parents and warmth, love and support in the family ($\alpha=0.87$). The parental rules/control sub-scale includes 5 items to measure parental rule setting, monitoring and supervision ($\alpha=0.78$). The school support sub-scale includes 7 items to measure support from the overall school community and teachers ($\alpha=0.77$) and the peer support sub-scale includes 8 items to measure support from friends in general ($\alpha=0.83$). The composition of the sub-scales, including the eigenvalues, the factor loadings for each item, and the Cronbach’s alpha, are presented in Appendix Tables 1–6.

Precoital and coital behaviors

The percentage of male and female adolescents who reported ever engaging in specific precoital behaviors is shown in Table 2. Overall, a similar proportion of males and females reported hugging and holding hands, about 9 percent more males than females reported kissing someone, and twice as many males as females reported petting above and below clothing, with statistically significant differences between the two groups only for petting. Experience of more than three precoital behaviors was reported by over twice as many males (54.0%) as females (26.7%) ($p<0.001$). The results suggest the same progression through precoital behaviors for females and males: hugging, then kissing, then holding hands, then petting above clothing and finally, petting below clothing. These results are confirmed when looking across the three age groups for most behaviors. For example, petting below the clothes was reported by 10.0% of 15-year old males and then increased, to 36.0% of 16-year old males and 38.0% of 17-year old males ($p=0.002$).

Overall, 19.7% of respondents reported having had vaginal sex at least once, with males (26.0%) being more likely than females (13.3%) to report this behavior ($p=0.006$), as shown in Table 2. The proportion of respondents that have had sex by age group warrants mention: whereas males follow a linear progression from 12.0% reporting ever sex at age 15 to 28.0% at age 16 and 38.0% at age 17 ($p=0.011$), 12.0% of females report ever sex at age 15 and almost the same percentage (14.0%) report ever sex age both at ages 16 and 17 ($p=1.000$).

Association between sub-scales and precoital behaviors and vaginal sex

Table 3 presents the bivariate associations between the sub-scales and the outcomes of both precoital behaviors and vaginal sex. Table 4 presents regression analyses of the two different outcomes on the factor scores of the sub-scales. In the adjusted multiple regression model for the outcome of ever vaginal sex, respondents with greater support from peers ($p=0.007$) had a lower rate of vaginal sex than those with less support. The adjusted multiple regression model for the outcome of precoital behaviors demonstrated that participants with higher scores on the family education ($p=0.024$) and peer support ($p=0.001$) sub-scales had lower odds of reporting more precoital behaviors than those with lower levels of both type of support. Self-image, goals and decision-making and parental rules/control were not significantly associated with the outcomes in either of the adjusted models.

Discussion

This study provides important new sub-scales for measuring factors associated with adolescent sexuality and sexual behaviors in Peru and other low-resource setting. The high internal reliability of these sub-scales affirms the value of adolescent participant in all steps of the research process: the brainstorming of possible concepts, the formulation of sub-scale items, the validity testing of the initial sub-scales, and the application of the final sub-scales with peers. This study also offers important information on the experience of precoital and coital behaviors among adolescents in urban Peru and affirms the influence of parent/family and peer support on these behaviors.

The current study's findings regarding adolescent sexual activity are consistent with past research (Lam et al., 2002; Pinter & Tomori, 2000; Upadhyay et al., 2006). As in other countries, the results confirm the more rapid progression of males through precoital behaviors, with a more gradual, consistent progression for males than for females. These tentative findings need to be confirmed by asking respondents about the age when they first experienced each behavior. The proportion of respondents that reported ever sex in this study reflects past research findings in Lima (Cáceres, 1999; Chirinos et al., 2000; Saravia et al., 1999; Quintana, 2002).

This study confirms the impact of connectedness with and support and monitoring from parents and family on sexual behaviors among adolescents in this context. In a past study with adolescents across Peru, one family-related survey question – the perception of being important to the people they live with – was found to lessen the likelihood of sexual initiation. None of the other family-related variables were found to be associated with the outcome (Magnani et al., 2001). Other more recent studies have explored the relationship between family support and monitoring and risky sexual behavior. A large study with over

60,000 adolescents in Brazil found that low parental supervision and never eating meals with parents were associated with an increased odds of unprotected sex (Oliveira-Campos, Giatti, Malta, & Barreto, 2013). A study with over 2,500 adolescents in El Salvador also found that low parental supervision was associated with an increased odds of ever sex (Ruiz-Canela et al., 2012). Among female adolescents in Cambodia, lower family support was associated with higher levels of risky sexual behavior, including sexual initiation (Yi et al., 2010). A study with Kenyan adolescents found that different aspects of the family relationship were important for different outcomes: those with more caregiver social support were more likely to have sex, but those with more caregiver monitoring were less likely to engage in risky sexual behaviors including multiple partners and unprotected sex (Puffer et al., 2011). In this study, and in contrast to studies in other contexts, the parental rules/control sub-scale was not associated with the outcomes in the adjusted models. However, the family education sub-scale, which includes support and connectedness, reduced the likelihood of precoital behaviors. These findings are encouraging and suggest the importance of continuing to explore how different dimensions of the adolescent – parent/family relationship play a role in adolescent sexuality. They also affirm the importance of programming to enhance parent-adolescent connectedness starting in early adolescence. However, it is also important to recognize that the family education sub-scale in this study did not ask about parent-child communication about sexuality. This is a key limitation and an issue that warrants inclusion in future versions of the sub-scale.

Support from peers reduced the likelihood of precoital and coital sexual behaviors in this population. Most past studies in low-resource countries have examined and found a positive relationship between adolescents' perception of their peers' sexual behavior and their own sexual experience (Mmari & Blum, 2009; Mmari & Sabherwal, 2013). Few past studies in low-resource countries have examined the impact of general peer dynamics on adolescent sexual behaviors and those that have did not find an association (Anteghini, Fonseca, Ireland & Blum, 2001; Karim, Magnani, Morgan, & Bond, 2003). One study with African-American adolescents in the United States warrants mention since it examined the role of supportive friendships. Specifically, it found that supportive friendships were a moderator between life stressors and sexual risk behaviors. Among participants with low peer support, uncontrollable stressors were associated with greater sexual risk behaviors, but among those with high peer support, this relationship did not hold (Brady, Dolcini, Harper, & Pollack, 2009). Findings in the current study also affirmed that peer support reduces sexual behaviors. This underscores the need to integrate peer-based strategies into sexuality education and related initiatives.

This study has some limitations. First, the cross-sectional study design means that it is possible to generate hypotheses about relationships, but that no conclusions can be made about cause occurring prior to effect. Next, given the sensitive nature and societal norms around adolescent sexuality, social desirability bias may play a role. Adolescent desire to respond according to social norms may influence females to base their answers on norms that restrict female sexual activity and males to over-report behaviors to meet society's expectations for males to have sexual experience (Gregson, Zhuwau, Ndlovu, & Nyamukapa, 2002). Third, although the study's sample size meets the requirements for a good-quality factor analysis, its exploration of multiple sub-scales with the same study

population and data limited its capacity to carry out analyses beyond the exploratory stage. Similarly, the sample size limited the power of the multiple regression analyses and disallowed stratification of the sample by gender. Finally, and very importantly, the authors do not believe that precoital and coital behaviors in and of themselves are unhealthy or negative. However, accompanying practices such as non-use of condoms is both unhealthy and negative. In other contexts, precoital behaviors have been found to predict sexual initiation (Miller et al, 1997). Additionally, in past studies in Peru, condom use was low, at 26–38% (Cáceres, 1999; Magnani et al, 2001) and in this study, condom use at first sex was similarly low (32%). Given the low number of participants reporting vaginal sex in this study and our goal of carrying out analysis of associated factors, we were limited to analysis of precoital and coital behaviors instead of condom use.

Conclusions

This study strongly affirms the value-addedness of including adolescents in the research process, and specifically in the design and testing of psychosocial measures. Findings from this study revealed the influence of the factors and sub-scales named by adolescents as important for their sexuality. Results suggest the need for comprehensive sex education that begins in early adolescence and employs peer-based strategies and activities to involve parents and family. Future research should examine in greater detail how parent/family and peer support affect adolescent sexual and reproductive health.

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Figure 1.
Operationalization of Concepts from Concept Mapping into Items for Sub-scales

Table 1
Socio-demographic Characteristics of Peruvian Adolescents Overall and by Sexual Behaviors

Characteristics	Females			Males		
	Overall (n=150)	Have had vaginal sex	More (4-5) precoital behaviors	Overall (n=150)	Have had vaginal sex	More (4-5) precoital behaviors
	% (n)	%	%	% (n)	%	%
Total	--	13.3	26.7	--	26.0	54.0
<u>Age</u>						
15 years	33.3 (50)	12.0	20.0	33.3 (50)	12.0**	40.0*
16 years	33.3 (50)	14.0	30.0	33.3 (50)	28.0	60.0
17 years	33.3 (50)	14.0	30.0	33.3 (50)	38.0	62.0
<u>Household wealth (floor type)</u>						
Low (dirt, wood)	6.0 (9)	33.3	44.4	16.7 (25)	28.0	40.0
Middle (cement)	78.0 (117)	12.8	23.9	76.0 (114)	26.3	57.0
High (parquet, vinyl)	16.0 (24)	8.3	33.3	7.3 (11)	18.2	54.6
<u>Parental structure</u>						
Both parents/figures	78.0 (117)	9.4**	27.4	82.0 (123)	23.6	52.0
Mother/figure only	13.3 (20)	20.0	20.0	12.0 (18)	44.4	66.7
Father/figure only	4.7 (7)	57.1	57.1	3.3 (5)	20.0	40.0
Other arrangement	4.0 (6)	16.7	0.00	2.7 (4)	25.0	75.0

* p 0.05.

** p 0.01.

*** p 0.001.

Table 2

Percentage and Number of Peruvian Adolescents who Reported Engaging in Precoital and Coital Behaviors, by Sex

Outcome	Females % (n)	Males % (n)
Hugging	86.0 (129)	88.0 (132)
Kissing	73.3 (110)	82.0 (123)
Holding hands	68.0 (102)	70.7 (106)
Petting above clothing	31.3 (47)	62.0 (19) ***
Petting below clothing	12.0 (18)	28.0 (42) **
Vaginal sex	13.3 (20)	26.0 (39) **

**
p = 0.01.

p = 0.001.

Table 3

Peruvian Adolescent Scores on Sub-scales Overall and by Sexual Behaviors

Characteristics	Overall (n=300) % (n)	Have had vaginal sex %	More (4–5) precoital behaviors %
<u>Self-image sub-scale</u>			
Low	49.7 (149)	23.5	50.3***
High	50.3 (151)	15.9	30.5
<u>Goals and decision-making sub-scale</u>			
Low	54.3 (163)	15.3*	36.8
High	45.7 (137)	24.8	44.5
<u>Family education sub-scale</u>			
Low	46.7 (140)	25.0*	47.9**
High	53.3 (160)	15.0	33.7
<u>Parental rules/control sub-scale</u>			
Low	54.3 (163)	25.2**	47.2**
High	45.7 (137)	13.1	32.1
<u>School support sub-scale</u>			
Low	48.0 (144)	19.4	33.3*
High	52.0 (156)	19.9	46.8
<u>Peer support sub-scale</u>			
Low	56.7 (170)	20.2	34.7*
High	43.3 (130)	18.9	48.0

*
p 0.05.**
p 0.01.***
p 0.001.

Hazard Rates and Odds Ratios from Bivariate and Multiple Regression Models of Vaginal Sex and Precoital Behaviors on Factor Scores Among Peruvian Adolescents[‡]

Factor scores and Control variables	Outcome of ever vaginal sex (Cox proportional hazards regression)		Outcome of more precoital behaviors (Ordered logistic regression)	
	Only factor score Unadjusted Hazard Rate (95% CI)	Saturated multivariate model Adjusted Hazard Rate (95% CI)	Only factor score Unadjusted Odds Ratio (95% CI)	Final multivariate model Adjusted Odds Ratio (95% CI)
Self-image	0.75* (0.59–0.97)	0.72 (0.50–1.05)	0.77* (0.63–0.95)	0.87 (0.66–1.14)
Goals and decision-making	0.75* (0.58–0.96)	0.91 (0.68–1.21)	0.79* (0.64–0.97)	0.86 (0.69–1.09)
Family education	0.77* (0.62–0.95)	0.80 (0.55–1.18)	0.71*** (0.58–0.88)	0.71* (0.53–0.96)
Parental rules/control	0.59*** (0.45–0.77)	0.74 (0.54–1.02)	0.67*** (0.54–0.82)	0.83 (0.64–1.07)
School support	1.10 (0.86–1.41)	not included	1.19 (0.97–1.44)	not included
Peer support	0.89 (0.69–1.16)	0.62** (0.43–0.87)	0.89 (0.72–1.09)	0.64*** (0.50–0.83)

* p 0.05.

** p 0.01.

*** p 0.001.

[‡] Multiple regression models control for sex, age, proxy measure for socioeconomic status, and parental structure and all sub-scales except school support.

Appendix Table 1

Description of Self-Image Sub-scale

Variable (Item)	Factor loading
I am the type of person I want to be.	.736
I am happy with the way I do most things.	.700
I am happy with myself as a person.	.696
I like my body just the way it is.	.712
I am happy with the way I look.	.692
I have a lot of self-respect.	.665
I feel good about my height and weight.	.613
I feel good about myself independent of my successes and failures.	.600
I am honest, even in difficult situations.	.569
I am responsible for my own well-being.	.532
I am responsible for my actions toward other people.	.491
Eigenvalue	4.53
Percent of Variance	41.16
Cronbach's Coefficient Alpha	0.85

Appendix Table 2

Description of Goals and Decision-making Sub-scale

Variable (Item)	Factor loading
I think that I should work hard to get something, if I really want it.	.746
I make decisions to meet my goals.	.710
The important things in life are clear to me.	.685
I make decisions according to what I think and believe.	.629
I feel good about my future.	.571
Before making a decision, I think about the positive and negative consequences.	.567
I have plans for my future.	.524
Eigenvalue	2.94
Percent of Variance	42.01
Cronbach's Coefficient Alpha	0.76

Appendix Table 3

Description of Family Education Sub-scale

Variable (Item)	Factor loading
I feel close to my family.	.764
My family pays enough attention to me.	.710
I am happy about how much my family loves me.	.703
My parent/guardian listens to me when I talk.	.678
I enjoy talking with my family.	.627
I can tell my parent/guardian how I feel about things.	.591
I get along as well as I'd like to with my family.	.655
I can go to my family for help when I have a problem.	.588
My parent/guardian says good things to me when I do something well.	.628
I feel good about how important I am to my family.	.623
I feel safe in my house.	.547
My parent/guardian encourages/used to encourage me to finish high school.	.523
My parent/guardian encourages me to continue studying after high school.	.506
Eigenvalue	5.17
Percent of Variance	39.77
Cronbach's Coefficient Alpha	0.87

Appendix Table 4

Description of Parental Rules/Control Sub-scale

Variable (Item)	Factor loading
I talk with my parent/guardian about the plans I have with my friends.	.702
When I go out at night, my parent/guardian knows where I really am.	.692
Before I go out, I tell my parent/guardian who I am going to be with.	.820
My parent/guardian knows where I am in my free time.	.772
When I go out, my parent/guardian asks where I am going.	.660
Eigenvalue	2.68
Percent of Variance	53.51
Cronbach's Coefficient Alpha	0.78

Appendix Table 5

Description of School Support Sub-scale

Variable (Item)	Factor loading
I am close to people at my school.	.453
My teachers treat me the same way that they treat everyone else.	.626
I can talk to one of my teachers if I have a problem.	.661
My teachers care about me.	.658
I can talk to one of my teachers if I have questions about sexuality.	.586
My teachers encourage me to finish high school.	.799
My teachers encourage me to continue studying after high school.	.759
Eigenvalue	3.02
Percent of Variance	43.20
Cronbach's Coefficient Alpha	0.77

Appendix Table 6

Description of Peer Support Sub-scale

Variable (Item)	Factor loading
I am as well liked by other kids as I would like to be.	.752
I feel good about how well I get along with other kids.	.700
I can talk to one of my friends if I have a problem.	.732
I can tell my friends about what's h in my life.	.695
I have as many close friends as I would like to have.	.644
I feel OK about how much other kids like doing things with me.	.565
My friends encourage me to finish high school.	.660
My friends encourage me to continue studying after high school.	.565
Eigenvalue	3.67
Percent of Variance	45.87
Cronbach's Coefficient Alpha	0.83