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Knowledge, attitudes and practices related to sexual and reproductive health among adolescents
from two secondary schools in Chota, Cajamarca, Peru.

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Abstract

Knowledge, attitudes and practices related to sexual and reproductive health among adolescents from two secondary schools in Chota, Cajamarca, Peru.

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Global Health

Adolescent pregnancy rates are increasing in Peru. Although the Ministry of Health collects data about adolescent pregnancies, little is known about the knowledge and practices of youth in rural areas to inform design of educational interventions. In 2014, 315 students in two secondary schools in the city of Chota, Cajamarca Peru completed a cross-sectional self-administered anonymous survey related to reproductive health knowledge, attitudes and practices. Of these students, approximately 25% report having already initiated sexual activity, with much higher rates among boys than girls, and in specific schools. Bivariate statistics revealed that teachers are the most frequently cited source of sexual health information, and regression models showed that students who speak to teachers have significantly higher knowledge in reproductive health but report little difference in sexual behavior. Results provide evidence for a comprehensive approach to sexual health for adolescents in Chota, taking into account the low knowledge levels and the reality that some adolescents are already engaging in potentially risky sexual behavior.

INTRODUCTION

In 2011, the Peruvian Ministries of Health, Education, and Women and Vulnerable Populations published a multisectorial plan to reduce pregnancy in adolescence, recognizing reproductive health as one of the primary risk factors faced by that age group in Peru. This plan, as many before it, prescribes integrating the efforts of health education and promotion through multidisciplinary efforts in school-based reproductive health education, differentiated hours at health establishments for adolescents, and community-based health promotion activities [1, 2]. Despite efforts to emphasize adolescent health in national-level guidelines in Peru, few coordinated and long-term actions are taken at local levels in rural areas due to limited resources, frequent turnover of personnel and other organizational challenges. Furthermore, little is known about the reproductive health needs, practices and beliefs of adolescents in the rural Andean communities of Peru, where discussions with youth about sexuality are not common and there is a lack of research capacity. The limited interventions that exist in these areas are therefore typically not driven by data nor evaluated against specific or measurable objectives.

The analysis presented here aims to examine the possible relationships between the sources of information that students access related to sexual and reproductive health (SRH), with their knowledge levels about SRH and their reproductive behaviors. It is part of a larger survey of students' knowledge, attitudes and practices conducted in Chota, Cajamarca, Peru implemented to provide local health and education authorities with specific information about the reproductive health and education of adolescents in their community. As a result of the survey data Chota health and education authorities planned to convene a multi-disciplinary committee in 2015 to determine next steps in sexual and reproductive health education in the district of Chota.

Adolescent Sexual and Reproductive Health in Peru

The issue of adolescent reproductive health and reproductive rights is increasingly a topic of global interest. In 2012, the United Nations Commission on Population and Development boldly called for what Chandra-Mouli of the World Health Organization describes as “the right of young people to comprehensive sexuality education (CSE), to decide on all matters related to their sexuality; access to sexual and reproductive health (SRH) services, including safe abortion where legal, that respect confidentiality and do not discriminate; and the protection and promotion of young people’s right to control their sexuality free from violence, discrimination, and coercion” [3]. Although Peru has lower adolescent pregnancy rates than most of the rest of the Latin American and Caribbean region, adolescent pregnancy has increased in Peru between 2009 to 2014 from 13.7% to 14.6%, indicating a need for renewed and concerted focus on this public health issue [4]. According to the most recent national census performed in 2007, adolescents from 10 to 19 years of age make up 21% of the Peruvian population [5]. According to National Demographic and Health Surveys in Peru, the proportion of adolescents who have initiated sexual relations between the ages of 15 to 19 years of age has increased from 18.2% in 1991 to 29.2% in 2012 [6] and teenage pregnancy accounts for 25.3% of school dropouts among Peruvian adolescent girls [5]. In a large cluster-randomized study conducted in 2008 of the three principal cities of Peru—Lima, Huancayo and Iquitos—21.2% of females and 41.1% of adolescent males between 15 and 19 years old reported having had sexual relations at least once in their lives. Median ages of first sexual encounter varied only slightly by city and gender: 15.8 for females and 15.6 for males in Lima, 16.4 for females and 15.9 for males in Huaycayo, and 16.0 for females and 14.0 for males in Iquitos. In this sample of Peruvian adolescents only half of the respondents report using contraception in their most recent sexual relation [7]. However,

increasingly more female adolescents who become pregnant in Peru report that they wish they could have postponed the pregnancy, from 35% in 1992 to 59.4% in 2014 [4]. This indicates a shift in child-bearing priorities for adolescent females, but one that has not been strong enough to prevent the recent increase in pregnancy rates among adolescents.

Sexual health risks for adolescents not only include pregnancy but also the possibility of acquiring life altering sexually transmitted diseases. As of April 2015, approximately 90,000 Peruvians are registered with the Office of Epidemiology with the Ministry of Health as infected with HIV or having AIDS. The largest group affected by HIV are those between the ages of 25 - 29, indicating that these people most likely became infected during their adolescent years [8, 9].

Adolescent Reproductive Health and Education Interventions in Peru

Peruvian national interventions in adolescent sexual health education are initiated by the General Direction Directorate of Health Promotion within the Ministry of Health, in coordination with the Ministry of Education. These programs, however, have not been consistently executed and sustained across the country despite the legal basis for such coordination in place since 2005 in the Ministry of Health [10] and 2008 in the Ministry of Education [11]. Although the Ministry of Health's "Adolescent Health Policy Guidelines" and its "Pay for Services" budgeting program now provide financial incentives to providers for each adolescent preventive screening and counseling completed, these strategies have had limited implementation and have not been evaluated for impact [6] which is a shortcoming observed by global experts in the evaluation of adolescent SRH programming across the world [3, 12].

After receiving funding from the Global Fund to Fight HIV and Tuberculosis in 2002 and 2006, Peru placed increased attention on issues of adolescent reproductive health under the

banner of HIV prevention. These projects sought to form adolescent peer educators in secondary schools with support from key mentor professors who received technical support from health workers as a part of a larger packet of HIV prevention interventions. Evaluations of these projects show satisfaction among direct participants but reveal that problems in coordination and unsuccessful efforts to institutionalize sexual education within the activities of the health establishments, secondary schools and youth centers, left little lasting impact after the close of the funding. The program also overlooked the potential key support of including parents in educational outreach efforts [9, 13]. This evaluation of sexual health peer education programs coincides with similar critiques from other countries regarding the insufficient integration of peer educators into existing networks of health services for adolescents, and the general critique of SRH programs as not successfully targeting the highest risk adolescents [14, 15, 16].

Beyond the public sector, or in coordination with the public sector in Peru, many projects have been funded by NGOs and other external funding sources in specific communities and regions with localized or short-term successes. In most cases, these projects have not been rigorously evaluated, do not reach a level of sustainability without continued external funding, and are not present in all communities that need these services [17, 18, 19]. Peruvian public health officials cite sexual education interventions in general as having non-sustained results because of lack of funding for interdisciplinary approaches, socio-cultural barriers (myths, taboos, etc.), and the limited focus of the interventions [7].

Global health research is increasingly demonstrating the need for coordination between sectors, and between organizations and target populations for effective adolescent SRH services and interventions [3, 14, 20]. Most recent evidence calls for comprehensive sexual education to not only include information about the risks of sexual activity, but also foster a community level

conversation about values, gender and power as well as foster skills and abilities in young girls to be able to negotiate their path for the future related to reproductive health [21, 22, 23]. This requires a high degree of communication and coordination between historically weak public and non-governmental sectors.

Reproductive Health: Context of Chota, Cajamarca Peru

Located in the northern Andes, the department of Cajamarca has one of the largest populations of adolescents and one of the higher rates of adolescent pregnancy in the country [24]. According to the Peruvian National Household Demographic Survey, ENDES 2013, in the region of Cajamarca 19.4% of adolescents between 15 and 19 years old were pregnant or had already had their first child, with higher rates among those in the lowest economic quintile; in other Sierra departments that rate is 12.3% for the same age group. Cajamarcan pregnancy rates are second only to the rates of adolescent pregnancy found in the departments that make up the jungle (Amazonas, Loreto, Ucayali, San Martin) and the border with Ecuador (Tumbes) [4]. Chota is one of the largest provinces within Cajamarca, with a population of 167,670, and subsequently has one of the largest health networks. In 2014, the adolescent pregnancy rate in the province of Chota was approximately 11% [25].

Although HIV prevalence in Cajamarca remains relatively low, health officials are concerned about the possibility of a future increase in the department. As of the month of April 2015, 213 are persons identified by the Ministry of Health as living with HIV in Cajamarca, and 42 persons living with AIDS in the department [8]. Much of the young population of Cajamarca migrates seasonally for work or school to the coastal or jungle regions where they are exposed to different cultural norms about sexuality and where HIV prevalence is much higher. These

adolescents are at increased risk for HIV/ STI acquisition during this time, and health officials note that this is a significant means of increasing HIV/STI rates in Chota.

In many rural areas, as is the case in Chota, there is no systematic collection of information related to knowledge, attitudes and practices among adolescents regarding reproductive health, nor documentation of the effectiveness of interventions in this area. The health authorities of Chota, the Red de Salud Chota, collect data on the number of adolescent pregnancies, but has no specific information about the factors associated with adolescent sexual behavior and knowledge. In Chota, the Peruvian nationally dictated policy of providing differentiated hours for adolescent attention at health centers have not been highly successful in practice, due to frequent turn over of staff, limited emphasis by local authorities and little community promotion of these services [25]. Chota health workers have sporadic interaction with adolescents, generally only when the teens arrive to the health establishment with a specific health concern. Sexual and reproductive health education is supposed to be transmitted through the secondary school courses, although the content is variable. Teachers, parents and health workers frequently agree on the importance of adolescents making healthy life choices, but discussing issues of sexuality is fairly taboo, making it difficult to decide what those choices should be, or how to encourage them.

DESIGN AND OBJECTIVES

In July of 2014, 315 adolescents in Chota, Cajamarca, Peru in two secondary schools participated in a descriptive cross-sectional self-administered survey of 30 multiple-choice questions regarding their knowledge, attitudes and practices related to sexual and reproductive

health. The survey was based upon a Spanish-language survey designed and validated by Family Health International (FHI) [26]. The language of the survey was adapted to fit local language and this study's aims. Prior to study implementation, the survey instrument was pilot tested with a group of 35 students at the post-secondary teaching college in Chota, with students who had recently attended secondary schools in Chota and shared similar characteristics as those in the sample population.

The survey sought to determine the relationships among knowledge, information sources, and practices of Chotano adolescents related to sexual and reproductive health, including prevention of pregnancy and HIV/STI transmission. Within these broad survey objectives, this analysis sought to answer the following specific questions:

- Are the students' past sources of information about sexual/reproductive health (SRH) significantly associated with their knowledge related to reproductive health?
- Is student knowledge related to reproductive health significantly associated with behavior, when controlling for information source and other factors?
- Are students' sources of reproductive health information significantly associated with behavior, when controlling for knowledge and other factors?

METHODS

Setting

Within the city limits of Chota there are 5 secondary schools in addition to a number of primary schools and a handful of technical post-secondary institutions. Chota city secondary schools have more than 3,000 enrolled students, making up approximately 60% of the secondary students enrolled in the district of Chota. Although a number of secondary schools exist outside

of the city of Chota, students who live in nearby rural areas frequently elect to attend schools within Chota city, meaning these secondary schools have a mix of students from rural and urban areas.

Sampling Strategy and Participants

This study employed purposive sampling to capture all of the 315 students in the 4th and 5th grades of two of the five secondary schools in Chota: I.E. El Comercio Abel Carabajal Pérez and I.E. Sagrado Corazón de Jesús. The researcher distributed surveys to students in the classroom setting and provided an explanation of the importance of students' answering honestly. Students then filled out individual surveys silently with the researcher present to clarify any questions. No other adults or authorities were present in the classroom while students completed the survey.

At the time of sampling, students were in the middle of their academic school year. The study received ethical approval from the University of Washington's Institutional Review Board, and the Provincial Health and Education Authorities of Chota (the RED de Salud de Chota and the UGEL de Chota), as well as approval of directors of the two schools. Parents were notified of the study and were given an opportunity to opt for their son/daughter not to participate. All 315 adolescent participants in the sampling frame agreed to participate and provided verbal assent.

Data Source and Variables

The outcomes of interest for this analysis were sexual behavior and sexual and reproductive health knowledge. Sexual behavior was measured by whether or not a student reported ever having had sexual relations in the past. Knowledge levels were determined based

upon the number of correct answers to 6 reproductive health questions. ‘Yes’ was considered a correct answer, while answers of ‘no’ or ‘I don’t know’ were counted as incorrect. The questions were:

- 1.) Can a female become pregnant the first time that she has intercourse?
- 2.) Can a person contract HIV/AIDS the first time s/he has intercourse?
- 3.) Does using condoms reduce the risk of contracting HIV/AIDS?
- 4.) Can a person who looks healthy be HIV positive?
- 5.) Does using condoms reduce the risk of contracting STIs?
- 6.) Does abstinence reduce the risk of contracting STIs?

To predict sexual behavior and reproductive health knowledge, the following predictor variables of interest were included in this analysis: a student’s knowledge levels (described above), and a student’s sources of sexual and reproductive health information. Of the various information sources in the original survey, this analysis examines the three most frequently cited sources of reproductive health information: parents, teachers and health workers. Variables for gender, grade, mother’s education level, school and classroom were also included in the multivariate models as potential confounders.

Analysis

Descriptive statistics were calculated comparing those who reported previous sexual relations to those who did not, using means for numerical variables and counts for categorical variables of interest. The relationship between the dependent variable (previous sexual relations) and each of the categorical independent variables of interest — demographic factors and information source—were evaluated using Pearson’s Chi-Square test of significance.

A linear model with random effects for classrooms, and two logistic models with random effects for classrooms were used to investigate the associations between the main exposures of interest—information sources and knowledge levels—and the dependent variables -- knowledge levels and reported previous sexual activity. To assess the associations of the student's reproductive health information source with the knowledge score (Model 1), the average increase in number of questions answered correctly was modeled to compare having talked to a particular information source with not having talk to that source. Odds ratios were modeled to assess the associations of the report of previous sexual experience with reproductive health knowledge (Model 2), and the report of previous sexual experience with both knowledge score and source of information (Model 3). In each of the three models, a variable indicating the student's classroom was included because of the possible effect of the classroom functioning as a network that would produce some correlation among its students. All models also included covariates for the respondent's gender, grade, school, and mother's education level.

RESULTS

A total of 315 students participated in the survey, of which 80 students (25%) reported having had sexual relations (Table 1). Significantly more males than females reported previous sexual relations (71% vs. 29%, $P>0.001$), and those who reported previous relations were slightly older than those who reported no previous sexual relations (16.0 years vs. 15.6 years). There were no significant differences between those who reported previous sexual relations and those who did not according to the student's grade level or mother's education level.

Teachers were the most frequently cited source of information (60% of total), with no significant differences in reported sexual experience for that group. Only 36% of respondents

report having received SRH information from parents and 23% report receiving SRH information from a health worker, without significant differences in reported sexual experience for either group. On average, students answered 3.7 of the 6 reproductive health questions correctly. Students who reported previous sexual relations answered significantly more questions correctly (4.1) as compared to students who had not had previous relations (3.6, $P < 0.001$). Although not included in the multivariate modeling because of small sample sizes, 47% of the students who reported previous sexual relations also report having used some form of contraception in their most recent sexual encounter.

Table 2 shows the results of the three multivariate models of relationships among the study variables. Model 1 shows average change in knowledge scores for each source of reproductive health information, including all demographic factors. Students with higher scores were significantly more likely to be male, seniors, students from IE Sagrado Corazon, and to have mothers with secondary school education or higher. Students whose reproductive health information came from teachers answered significantly more questions correctly than those who did not (0.84, $P < 0.001$, CI: 0.12, 0.84). Students who reported speaking with parents had higher scores than those who did not, an association of borderline significance (0.31, $P < 0.1$). Those who reported speaking with health workers had knowledge scores that were not significantly different from those who did not.

Model 2 shows the association between knowledge levels and reported previous sexual activity, adjusting for demographic factors. Those students with higher knowledge had significantly higher odds of reporting previous sexual activity (OR: 1.29, CI 1.06, 1.58). The odds of reporting sexual activity were also significantly higher among male students vs. female students (OR: 4.52, CI 2.46, 8.31), and among those who attend IE Comercio vs. IE Sagrado

(3.49, CI 1.754, 6.96). No significant differences were found in the odds of reporting previous sexual relations related neither to mothers educational level nor to the grade of the student.

Finally, Model 3 shows the odds of reporting previous sexual activity related to having spoken to specific information sources, adjusting for differences in knowledge levels. None of the three indicators of reproductive health information — health workers, parents, and teachers — were independently associated with a difference in odds of reporting previous sexual relations.

DISCUSSION

This study shows that teachers are the most frequently cited source of reproductive health information for students. Those students who report receiving information from teachers also have significantly higher reproductive health knowledge than those who did not receive information from teachers. However, speaking with a teacher, a parent or a health worker about reproductive health is not significantly associated with differences in sexual behavior. Among the 4th and 5th grade students surveyed from secondary schools in Chota, with mean age of 16, approximately 25% of report having already initiated sexual activity, with higher proportions among boys than girls, and in the school I.E. El Comercio than in I.E. Sagrado. Those students who reported previous sexual relations were more likely than those who did not report previous sexual activity to have a higher reproductive health knowledge score, independent of their reported SRH information sources.

SRH Information Sources

Results about information sources from Chota adolescents are in line with findings from other studies of SRH information for adolescents across Peru. In the cluster-randomized study conducted by CARE in Lima-Huancayo-Iquitos in 2008, 2,181 adolescents in the three regions of the country cited teachers as their principal source of SRH information. Approximately 90% of these students reported that their teachers had taught them about diseases that can be transmitted during sexual relations; 40-50% of this population reported receiving the most of their information about SRH from teachers, while only 20-30% report their mothers as their principle source of information [8]. Chota students also rank teachers as most frequent SRH information source, followed by parents. In a study conducted in Tacna Peru (a medium-sized boarder city) students also frequently report having received SRH information from teachers (62.2%), although similarly high proportions received SRH information from flyers (69.4%) and from television (64.2%). Parents and health workers were less frequently cited sources of information by this group (27% and 24% respectively) [27]. In contrast, in a study among boys from Chimbote Peru (a medium size industrial-coastal city) media sources—TV, radio, internet—were the most frequently cited sources of SRH information (54%) followed by educational sessions in the secondary school (33%) [28]. As compared to Tacna or Chimbote, Chota is a smaller, more rural, conservative and Andean city. Media sources were not as frequently reported as sources of SRH information in Chota possibly due to the limited availability of Internet, and the limited variety of television and radio programs.

Of note, in the CARE Lima-Huancayo-Iquitos study, only about half of the students report that the sexual health information that they receive from teachers was “sufficient”. Instead, female students report wanting to receive information from their mothers or doctors, and

male students reported wanting to receive information from their fathers or doctors [7]. These results suggest a gap in the Chota research. In the present study, health workers are not frequently reported as past sources of SRH information, but no data were collected about where students believe that they should receive SRH information, nor their level of satisfaction with present SRH information sources. Future research regarding students' preferences and satisfaction could be useful to help bridge gaps in adolescents' access to information and SRH services in Chota.

Associations between Information, Knowledge and Behavior

The present study found significant associations between SRH information from teachers and a student having increased SRH knowledge, but found only borderline significance in association between SRH information from parents and increased SRH knowledge. No significant associations were found between teacher or parent-based SRH information and behavior. However, other studies from Peru highlight important protective links between parent-adolescent or teacher-adolescent communication and SRH knowledge as well as sexual behavior. In an urban district of Lima, adolescents who reported global family communication scores with their parents as “bad” (16.4% of the total population) and “very bad” (79.5% of the total population) had significantly lower reproductive health knowledge scores, and significantly reported more sexual relations without contraception [29]. In the CARE Lima-Huancayo-Iquitos study, students who report less satisfaction with sexual education in school were more likely to have initiated sexual relations, while those students who report having learned more about sexual health in school were less likely to have initiated sexual relations. Those students who rated sexual education in school as “insufficient” were 60% less likely to use a condom than their

peers who rated sexual education as “sufficient” ($P < 0.03$). Those students who report their parents talking to them about condoms were 2.8 times as likely to use condoms during sexual relations ($p < 0.001$) [7].

In contrast, the present study did not find protective associations between receiving information from parents and increased SRH knowledge, nor between parents’ as a SRH information source and delay of sexual debut. Although teachers were associated with increased SRH knowledge, no significant difference was found in behavior between those who spoke with teachers and those who did not. As suggested in research from other parts of Peru, the quality of communication, or a student’s satisfaction with the communication may also influence knowledge and behaviors. An analysis of the kind of information that students in Chota receive from teachers and parents would be useful to further understand possible reasons for the Chota results. Communication between teachers and adolescents or parents and adolescents could be beneficial in Chota, as seen in other locations, yet more research is needed to evaluate what kind of information and messages students are receiving in Chota from teachers and parents to achieve the protective associations that this kind of communication has in other locations.

Adolescent Sexual Behavior in Peru

Comparing specific results regarding sexual behavior in the present study to other studies is challenging because not all studies examine the same age groups, nor use the same questions to measure this behavioral outcome. Nevertheless, results related to sexual activity from Chota appear similar to results from other studies in Peru. According to a 2004 knowledge, attitudes and practices survey of 399 students between 14 and 17 years of age in Tacna Peru, the average age of initiation of sexual activity was at 14.1 years of age among males and 15.4 years of age

among females, with 34.7% of the male participants reporting having had sex versus 8.5% of the females. Of those who were sexually active, 41% report always having used a condom, while 31% report never having used a condom [27]. In an urban district in Lima, in 2007 the average age of sexual debut among 1109 students between 10-19 years if age was 14.5 years [29]. A 2013 Lima hospital-based study of teens between 10 and 19 years of age who attend adolescent reproductive health services, the average age of sexual debut was between 14-16 years of age, and only 40.9% reported using condoms during sex [30]. Finally, a non-randomized survey of 100 males between the ages of 10-19, conducted in 2010 in the urban coastal city of Chimbote Peru found that average age of sexual initiation was 14.7 years, with 28% of the participants reporting having had sexual relations [28] mirroring the proportion of adolescents in Chota who reported sexual relations.

Although no significant associations were found between SRH information source and (lack of) previous sexual activity, this study reveals other important characteristics of Chota students who reported having already initiated sexual activity at the time of the survey. Significantly more males than females (OR 4.54) reported previous sexual activity. In other Peru-based studies that include both male and female participants, the average age of sexual debut is younger in males—as is the case in Tacna [27] and Lima-Huancayo-Iquitos [7] results—and the proportion of respondent who report previous sexual activity is greater among males than among females. Recognition is growing globally for the need to acknowledge these kinds of gender differences in adolescent sexual activity, as well as the contextual differences for male and female adolescents, which dictate social norms, access to health care and messages about sexuality [12, 20]. The present results reveal that not only do male Chota students report more sexual activity; they also demonstrated a significantly higher knowledge of sexual and

reproductive health knowledge than their female peers (0.71 more questions correct, $p < 0.001$). While the present study did not focus on socio-cultural gender messages or attitudes related to sexuality in Chota, the differences in sexual behavior between female and males students is striking and warrants further analysis. Adolescent SRH programs are increasingly including components of gender equality and human rights with activities aimed at empowerment of adolescent girls to effect unwanted pregnancy and transmission of sexually transmitted infections [3, 23], which may be appropriate in Chota.

The other marked characteristic of students who report previous sexual experience is student's secondary school: IE Comercio students were more likely to report previous sexual activity as compared to students from IE Sagrado (OR 3.49 Model 2 and OR 3.59 Model 3). IE Comercio is a smaller educational institution with less funding, and is known traditionally for educating students who live in rural areas outside of Chota city. These families therefore may have lower socio-economic status. However, although a student whose mother's education level (a proxy for SES) is higher had slightly increased knowledge, differences in mother's education was not found to be significantly associated with reporting previous sexual activity. The specific reason for the reported differences in proportion of sexual activity across the schools cannot be clarified by the present study, yet these results indicate the existence of subpopulations within Chota that may call for different prioritization for effective SRH education interventions. Future analysis of the possible difference in SRH educational approaches between the schools could also provide clues to designing effective interventions.

Finally, in both models with sexual activity as an outcome, increased SRH knowledge scores were associated with increased odds of reporting previous sex (OR 1.29). Given the cross-sectional design of this study, this survey cannot assess temporal associations in the

relationships between information sources, knowledge levels, and reproductive health behavior. It is not clear from the data whether students who reported sexual relations received information before having initiated sexual activity, or whether they may have sought more reproductive health information afterwards.

Limitations

With a sensitive subject such as reproductive health and sexual behavior it is possible that there is under- or over-reporting of the students' behaviors, despite the researcher's concerted efforts to ensure that participants comprehend the survey and answer honestly. No other adults were present during the survey administration to reduce the possibility of feelings of shame or pressure to answer in one way or another, but responses may still have bias. For knowledge-based questions, students were given the opportunity to answer, "I don't know" and were asked by the researcher not to guess, although it is possible that some still did. Additionally, it was clear during survey administration that questions that allow students to "Mark all that apply" were not well understood by all participants, suggesting that some level of error may be present in the participants' responses. The survey was conducted in a non-randomized sample two of the five schools in the city of Chota, and therefore results cannot be generalized to the entire population of Chota adolescents. Finally, this cross-sectional survey was not designed to make causal assumptions about the relationships between information sources, knowledge and sexual behavior. Despite these limitations, this study provides more data about the dynamics of a group of adolescents in a specific community of the Andes in Peru, and is in line with some of the larger dynamics and trends occurring across Peru related to adolescent reproductive health.

CONCLUSIONS

Chota Cajamarca is situated in the rural sierra of Peru and while its population self-identifies as having conservative social values, the results of this study show similarities in sexual activity among adolescents from Chota with adolescents from other regions of the country.

This research suggests that among students in Chota, males and those who attend IE Comercio are reporting more previous sexual activity than females and students from IE Sagrado, and perhaps are at higher risk for sexually transmitted infections. Teachers are the most frequent source of sexual and reproductive health information for adolescents in Chota, but students who have received information from teachers do not have significantly different behavior from those who did not receive information from teachers. Further analysis is needed to evaluate the quality and content of SRH education that students receive from teachers in order begin to address risky sexual behavior among adolescents. Unlike other studies, these results show little protective benefit from speaking with parents about sexual and reproductive health, in terms of differences in knowledge or in practices. Parents in Chota may benefit greatly from training in sexual and reproductive health information and how to speak to their adolescent children about this topic.

More research is needed to examine the relationships highlighted in this study, but regardless, a positive first step in Chota is the proposed formation of an interdisciplinary working group with school and health officials to begin to sensitize the population for the need to address adolescent reproductive health. According to international best practices, it is important for adolescent SRH efforts in Chota to be coordinated across sectors in the community to include

teachers, health workers and parents, to address gender norms, to be aimed at the highest risk groups, and to direct adolescents to friendly and supportive health services.

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Table 1: Characteristics of Chota Students who Report Previous Sexual Relations vs. Never Having Had Sexual Relations.

CHARACTERISTIC	Never Sex (n=235)		Previous Sex (n=80)		Total (n=315)	
	N	%	N	%	N	%
Demographics						
Gender***						
Females	159	68%	23	29%	182	59%
Males	74	32%	55	71%	129	41%
Missing	2	1.0%	2.0	3	4.0	1
Mothers Education						
Primary School or Lower	124	53%	41	51%	165	52%
Secondary School or Higher	104	44%	37	46%	141	45%
Missing	7	3%	2	3%	9	3%
Grade						
4th	126	54%	41	51%	167	53%
5th	109	46%	39	49%	148	47%
Age: Mean (Standard Deviation)***	15.6	(0.87)	16	(0.72)	16	(0.84)
Past Information Sources (could select multiple sources)						
Health Worker	51	22%	20	25%	71	23%
Parents	88	37%	24	30%	112	36%
Teacher	143	61%	47	59%	190	60%
Total Knowledge						
All 6 variables (mean)	3.6	(1.7)	4.1	(1.5)	3.7	(1.7)
Sexual Activity						
Contraceptive Use in Most Recent Sexual Relations					37	47%
TOTAL	235	75%	80	25%	315	100%

***Significance Level P<0.001

Table 2: Multivariate Models of Associations among Students' Information Source, Reproductive Health Knowledge and Sexual Behaviors

	Model 1: Information Sources and Sexual Reproductive Health Knowledge	Model 2: Reproductive Health Knowledge and Previous Sexual Relations	Model 3: Information Source and Previous Sexual Relations
CHARACTERISTIC	Increase in Number Correct (CI)	Odds Ratio of Reporting Previous sex (CI)	Odds Ratio of Reporting Previous sex (CI)
Demographics			
Male vs. Female	0.71*** (0.35, 1.08)	4.52*** (2.46, 8.31)	4.54*** (2.42, 8.53)
Senior vs. Junior	0.91*** (0.35, 1.08)	0.84 (0.46, 1.54)	0.83 (0.45, 1.53)
IE Comerico vs. IE Sagrado	-0.75*** (-1.16, 0.32)	3.49*** (1.75, 6.96)	3.59*** (1.79, 7.23)
Mother's Education: Secondary vs. Primary Education or Less	0.38** (0.02, 0.73)	0.94 (0.51, 1.71)	0.94 (0.51, 1.72)
Past Information Sources			
Spoke to Health Workers	0.22 (-0.2, 0.64)		1.59 (0.77, 3.27)
Spoke to Parents	0.31* (-0.07, 0.69)		0.86 (0.44, 1.71)
Spoke to Teacher	0.84*** (0.12, 0.84)		0.91 (0.49, 1.69)
Reproductive Health Knowledge			
Increased SRH Knowledge		1.29*** (1.06, 1.58)	1.29** (1.05, 1.58)

Significance Levels: *** P<0.01, **P<0.05, *P<0.

