Prevalence and factors associated to sexual behavior in Puerto Rican adolescents

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Sexual relations with intercourse (ASR-I) and high prevalence of teen pregnancies (19.2%, in 2002) among adolescents in Puerto Rico constitute a serious bio-psychosocial problem. Studying the consequences and correlates of ASR-I in community and mental health samples of adolescents is important in designing and implementing sexual health programs. Randomized representative cross-sectional samples of male and female adolescents from 11-18 years old (N=994 from the general community, N=550 receiving mental health services) who had engaged in ASR-I were the subjects of this study. Demographic, family, and sexual data and the DISC-IV were collected from individual interviews. Logistic regression models, bivariate odds ratios, Chi-squares, and *t* tests were used in the statistical analysis. The mental health sample showed higher rates of ASR-I, lifetime reports of pregnancy and lower age of ASR-I onset for females. No gender difference in the prevalence of ASR-I was observed in both samples. Older adolescents from the community sample meeting psychiatric diagnosis criteria, and with lower parental monitoring, were more likely to engage in ASR-I, whereas in the mental health sample, adolescents with lower parental monitoring and parental involvement reported significantly more ASR-I. Prevalence of ASR-I and Risky Sexual Behavior (RSB) were almost identical. Adolescents with mental health disorders initiate and engage in ASR-I earlier and more frequently regardless of gender. Older adolescents are more likely to engage in ASR-I and parent-child relationships emerged as a highly relevant predictor of adolescent sexual behavior. The high correspondence between ASR-I and RSB has important clinical implications.

Key words: Adolescent sexual relations with intercourse (ASR-I), Risky sexual behavior (RSB), Gender difference, Mental disorder, Parent-child relations.

Early initiation of adolescent sexual relations with intercourse (ASR-I) is an issue of particular importance because of its bio-psychosocial impact on adolescents, their families and the overall society (1-2). Many of the studies related to this issue associate early initiation of ASR-I to high prevalence of unwanted pregnancy, abortion, sexually transmitted infections (STIs), health problems of expecting mothers, negative impact on mother's academic and occupational future, as well as psychological and economic costs (3-7).

Prevalence and Age of Onset

The Youth Risk Behavior Surveillance System (8-9), conducted by the Center of Disease Control (CDC), has shown a consistent decrease in lifetime ASR-I in the United States (US) and Puerto Rico (PR) during the decade from 1991 to 2001 (2, 8-9). For instance, 54.1% of US high school students in 1991, compared to 45.6% in 2001, while in PR, 33.2% of high school students in 1991, compared to 28.3% in 2001, reported ever having sexual intercourse. In 2001 in Puerto Rico, 19.0% of 9th graders; 23.3% of 10th graders; 37.2% of 11th graders; and 46.7% of 12th graders reported ever having sexual intercourse. However, even with the decrease in prevalence over a decade, these rates are still high when compared to other countries. To this regard, approximately, 25% in Perú, 25% in Costa Rica and 26% in the Dominican Republic of unmarried adolescents engage in ASR-I (2). The 2003

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YRBSS (8-9) results showed that the prevalence of ASR-I not only varies by gender but also by age and ethnicity.

Research has indicated that the earlier the age of onset of ASR-I, the more severe impact of such behavior in the adolescent's life (5-6, 2) 7.4% of high school adolescents in the US reported (8-10) that they engaged in sexual intercourse before the age of 13. The age of onset of adolescent intercourse in the US (16.9 years) is one of the lowest of developed countries (11, 8). Findings for Puerto Rican youth indicate that 9.1% of adolescents attending high school reported having had intercourse before the age of 13 (8).

Risky Sexual Behaviors

Multiple sexual partners and the lack or inappropriate use of contraceptive methods (condoms and others) are major risk factors associated with ASR-I (2, 8-9). Fortunately, the rates of US adolescents having four or more sexual partners in their lifetime decreased from 18.7% in 1991 to 14.4% in 2003 and from 8.3% in 1991 to 4.6% in 2001 for Puerto Ricans (8). There was also an increase in condom use from 46.2% in 1991 to 63.0% in 2003 (in the last three months before responding to the survey) for the US sample and from 28.8% in 1991 to 33.0% in 2001 for the PR sample; thus two-thirds of the Puerto Rican respondents did not use condoms, rendering these youngsters at risk for many of the consequences associated with ASR-I. The use of other forms of contraceptive methods (e.g., pills) in the US sample had a prevalence of 17.0% in 2003 while in PR it was a considerably lower rate of 4.9% in 2001.

Risk and Protective Factors Associated with ASR-I

Mental Disorders: Studies have consistently demonstrated that mental health clinical samples are more vulnerable to sexual behavior and show a higher prevalence of consequences associated with this behavior (12). Adolescents with mental health conditions have a higher prevalence of early intercourse, more sexual partners and sexual relations, less frequent use of condoms, more pregnancies and STIs (13-20). In some studies, depression, lack of parental supervision and poor communication between adolescents and their parents permeate early ASR-I (21, 18, 22). Others also reported that living with both parents, parental regulation or supervision, high socio-economic status, strong religious affiliation and good communication skills constitute protective factors against ASR-I. Additionally, in PR and the US, the use of drugs or alcohol has been highly associated with the prevalence of adolescent risky sexual behavior (12, 11).

The current study presents data on prevalence,

consequences and correlates of ASR-I, among Puerto Rican adolescents. This study is unique in a number of ways. The data are derived from a psychiatric epidemiological study carried out in PR between 1998 and 2000 (23). The study's main purpose was to examine the prevalence and risk factors associated with mental disorders and service utilization among a probability household sample of children ages 4 to 18 from the island of Puerto Rico and a probability sample of children in the same age range referred to treatment. Identical methods for case ascertainment, assessment, and analysis were used for the two samples. ASR-I behavior and its consequences (pregnancy, STIs, etc.) were included in the study as one of the correlates that was expected to be associated with mental disorders in youth. To our knowledge, this is the first study that evaluates the prevalence of ASR-I, the rates of risky sexual behavior and its consequences, as well as the relationship of ASR-I and risky sexual behavior with mental disorders in Latino children from a representative community and clinical sample.

Method

Participants

The study was composed of two probability samples, an island-wide household community sample of children aged 4 to 17 years and a representative sample of medically indigent children in the same age range receiving services in the mental health and substance abuse sectors. Detailed methods of this study have been reported elsewhere (23). Using a two wave survey design this study collected data from 1999 to 2001. Data from the second wave, related to children ages 11 to 18, will be presented here. For the community sample, a multiple stage sampling strategy was used with the US 1990 Census block groups as the primary sampling units, stratified by urban/rural and health reform regions. Clusters of households were randomly selected from each strata followed by selection of households with children between the ages of 4 to 17; one child within each household was selected using Kish Tables adjusted for age and gender (24). This strategy yielded 1,886 parent/child dyads (response rate of 90.1%). The follow up was conducted with 94% of these participants.

The target population for the clinical sample was the total number of medically indigent children in PR ages 4 to 17 who received mental health and substance abuse services through the public health system and through the private sector by Managed Behavioral Health Organizations (MBHOs) from January 1, 1998 to May 31, 1998. At that time the government of PR was undergoing a health reform and had initiated the contracting out with private health insurance companies of all health services

previously provided by public health centers across the island to the medically indigent. In this reform, services were provided through MBHOs subcontracted by private health insurance companies using a managed care model. Data for the selection of children in the public mental health and substance abuse sectors were obtained from the rosters of children who received services during the specified time period from 11 community mental health centers and six outpatient substance abuse clinics. For the private sector, claims data from the four MBHOs were used. The selected medically indigent children and adolescents (8,568) received services within the specified period distributed as follows: public outpatient mental health clinics (N=3,489), outpatient substance abuse clinics (N=710), and MBHOs (N=4,368). A systematic sample with a random starting point was selected for both the public and private sectors. The sample was stratified by type of service (public mental health, substance, and MBHO), health reform regions and age of child. The selected sample consisted of 1,175 medically indigent children; 400 from the public mental health sector, 150 from public drug and alcohol services, and 625 from the MBHOs. Of the 1,175 selected children, 114 were deemed ineligible because they did not meet the age criteria for elegibility. Only one child was selected from each family. The total number of eligible children was 1,061 and 751 parent-child dyads were successfully interviewed for a response rate of 71.0% for parent-child dyads. During the second wave 95.8% of these parent child dyads were interviewed (N= 729). As with the community sample, only adolescents (11 to 17, N= 498) were selected for the present analyses.

Instruments and Measures

Diagnostic Interview Schedule for Children (DISC- IV): Presence of last year psychiatric disorders in adolescents based on the Diagnostic Statistical Manual of Psychiatric Disorders (25) was assessed using the latest translation into Spanish of the Computerized Diagnostic Interview Schedule for Children (26). The reliability of this Spanish version of the DISC-IV is comparable to the English version of the instrument (27). The process of translating the DISC-IV into Spanish involved a cross-cultural adaptation model that took into account the semantic, content, technical, criterion, and conceptual equivalence of cross- language versions of an instrument (28). Diagnoses from the DISC-IV are made through computer algorithms that implement the current diagnostic criteria based on the DSM-IV. The following diagnoses were evaluated: attention deficit disorder with hyperactivity (ADHD), social phobia, panic disorder, separation anxiety disorder, posttraumatic stress disorder, generalized anxiety

disorder, major depressive disorder, dysthymic disorder, oppositional defiant disorder, and conduct disorder. In this paper, the DISC IV impairment algorithm refers to moderate impairment in at least one area of functioning.

Measure of ASR-I, Risky Sexual Behavior (RSB) and Consequences of ASR-I: As part of the inquiry of correlates of psychiatric disorder and mental health service utilization, several questions from the YRBSS were included to cover a sexual behavior section in the Non-DISC interview. One question explored whether the subject had engaged in ASR-I; if the response was affirmative, other questions regarding sexual behavior were asked. The focus of the inquiry included: 1) type of ASR-I (vaginal or anal intercourse) and date of onset; 2) the frequency of RSB (i.e., whether the adolescent had more than four partners, did not consistently use contraceptives or started ASR-I before age 15) and 3) the consequences of ASR-I, (i.e., for the female sample, pregnancy test, ever being pregnant, average number of pregnancies and average number of children; for the male sample, ever get someone pregnant, average number of girls pregnant and average number of children). STI frequency was obtained by asking the adolescents whether they have been diagnosed by a physician with a STI such as clamydia, syphilis, gonorrea, etc.

Parent-Child Relationship Scales:

Parental Monitoring Scale (PARENT): Based on an instrument developed by Patterson and Stouthamer-Loeber (29), we assessed the extent of parental supervision and monitoring. Scale reliabilities for the original instrument are .54 for Caucasian subjects and .70 and .72 for African American and Hispanic subjects, respectively (29).

Parent-Child Attachment Scale: This scale (10 items) is adapted from Hudson's Index of Parental Attitudes and the Child's Attitude Towards Mother/Father Scale (30) and assesses the primary caretaker's perception about the quality of the parent-child relationship. Estimates of the scale's reliability range from .76 for Hispanic participants (mostly Puerto Ricans) to .81 and .82 for African-American and Caucasian subjects, respectively (31). The internal consistency of the scale for Puerto Rican caretakers in our community sample is .76.

Parent-Child Involvement Scale: This scale measures children's (age 9 to 17 years) perception of primary caretaker's involvement and support with school and friends, as well as quantity and quality of time spent together. Scale internal consistencies are .70 for Caucasian subjects, and .78 for Hispanics (31). For Puerto Rican youths, the internal consistency obtained in the reliability study is .80; the Intraclass Correlation Coefficient is .73.

Analytic Strategy:

Both samples were weighted to represent the population of children aged 4 to 17 in PR (community sample) and the Puerto Rican population of medically indigent children of the same age range who received mental health services from January 1, 1998 to May 31, 1998 (clinical sample). Design weights reflect differences in subjects' selection probability. For the clinical sample, design weights include an additional adjustment for non-response. Gender contrasts within each sample were conducted by means of the Chi Square test statistic for categorical variables and the t statistic for continuous measures. Logistic regression was used to estimate both crude and adjusted odds ratios when examining the demographic correlates and predictors of ASR-I. All predictors' variables were entered simultaneously. Interaction terms were not evaluated because we did not have any theoretical reason associated with the variables studied to consider any interaction. All statistical analyses were conducted using SUDAAN Software (32). All parameters were estimated with Taylor series linearization methods and all logistic regression coefficients were estimated with robust standard errors (33). Because the two samples represent different populations, and because the sampling designs were different, we carried out separate analyses for each sample rather than combining both samples into a single dataset for conjoint analysis. The estimates from these separate analyses could be contrasted directly while taking into account the standard error of the estimate. To compare estimates from community and clinical samples, we first estimated the parameter in each sample separately taking into account the unique sampling design for each sample. Next, we computed a test statistic composed of the difference between the two parameter estimates divided by an estimate of the standard error of that difference[1] Under the null hypothesis of no difference and with the sample sizes available for these analyses, this statistic will be distributed as a standard normal variable (34).

Results

Table 1 presents the relationship between demographic characteristics and the occurrence of ASR-I for both the community and clinical samples. This table includes bivariate odds ratios between each of the demographic variables and ASR-I.

For both samples, neither gender nor perception of poverty was associated with the occurrence of ASR-I. However, in both samples, religious practices and age were predictive of ASR-I. In both samples, youth without regular religious practices were more than twice as likely to engage in ASR-I, youth aged 15-18 were more than 30

times as likely to engage in ASR-I in comparison to youth aged 11-14. In the community sample, the prevalence of ASR-I for adolescents 11 to 14 was 1.16% and 29.26% for their 15 to 18 counterparts. In the clinical sample it was 4.34% for adolescents 11 to 14 and 53.88% for 15 to 18 year olds. Youth whose primary caretaker was unmarried were almost twice as likely to engage in ASR-I in the clinical sample; results were similar in magnitude in the community sample but only a trend was observed (p ≤.10).

Table 2 presents information about adolescents (11-18 years) in the community sample. There were no statistically significant differences between males and females in the prevalence of ASR-I, type of sex, average age of onset, RSB, average number of sexual partners and use of contraception. The overall prevalence of ASR-I was 14.79%. Most adolescents engaged primarily in vaginal sex, had their first sexual experience approximately at 15.22 years, used contraception about half of the time and had two to three sexual partners. Regarding the consequences of ASR-I, a majority (71.27%) reported engaging in RSB. Females reported a higher prevalence of pregnancy in comparison to males reporting impregnating their sexual partners. Almost half the youngsters who reported positively to the pregnancy questions also reported wishing the pregnancy. Both males and females reported a very low prevalence of sexually transmitted infections.

Table 3 presents information about the clinical sample. There were no statistically significant differences between males and females in terms of lifetime ASR-I, average age of onset, RSB, average number of pregnancies and average number of children born. In contrast, statistically significant differences in type of sex, average number of sexual partners, use of contraception, pregnancy and wish of pregnancy were found. Males were more likely to engage in anal sex (p ≤.001); however, there was no distinction made between insertive or receptive anal sex since it was not specified in the original questionnaire. Also, males had a higher number of sexual partners (p ≤.01), used contraception more frequently (p ≤.05), reported a lower rate of impregnating someone (p ≤.001) and had a lower wish of pregnancy (p ≤ .05). An extremely high prevalence of RSB was observed among this population, with almost 90% of females and 85% of males reporting risky sexual behavior. However, no one in the clinical sample reported ever having a sexually transmitted infection.

Contrast between samples were conducted by means of the Z-test for independent samples on the following variables: lifetime ASR-I, age of onset, use of contraception, number of sexual partners and pregnancy or impregnation.

Table 1. Demographic Characteristics of Adolescent (11-18) Sexual Relations (ASR-I) in Community and Mental Health Clinics

	Community (N=994)[a] Ever had sex[c] (n=149)				Mental Health Clinic (N=550)[b] Ever had sex[c] (n=150)			
	N	%	OR[d]	(95%CI)	N	%	OR[d]	(95%CI)
Gender								
Male	91	(15.33)	1.0		101	(27.42	1.0	
Female	58	(14.24)	0.92	(.57-1.48)	49	(33.34)	1.32	(.90-1.95)
Age								
11-14	5	(1.16)	0.03***	(.01-.09)	11	(4.34)	0.04***	(.02-.07)
15-18	144	(29.26)	1.0		139	(53.88)	1.0	
Perception of Poverty								
Live well	79	(14.01)	1.0		41	(24.50)	1.0	
Check to check	49	(16.07)	1.17	(.58-2.37)	66	(31.38)	1.40	(.92-2.16)
Live poorly	21	(14.91)	1.07	(.53-2.20)	43	(31.45)	1.41	(.86-2.32)
Parental Civil Status								
Married	78	(12.08)	1.0		48	(22.15)	1.0	
Not-married	71	(18.87)	1.69*	(.98-2.93)	102	(34.19)	1.83**	(1.27-2.62)
Religious								
Practice	57	(10.37)	1.0		47	(16.96)	1.0	
Yes	92	(20.97)	2.33***	(1.48-3.65)	103	(44.03)	3.85***	(2.65-5.60)
No								

NOTE. OR= odds ratio; 95%C I= 95% confidence interval.
[a] Due to missing data odds ratios were estimated with a minimum of 977 subjects.
[b] Due to missing data odds ratios were estimated with a minimum of 518 subjects.
[c] Lifetime sexual relations with vaginal or anal intercourse.
[d] Unadjusted odds ratios obtained by exponentiation of the regression coefficient from a logistic regression of ASR-I on each demographic variable.
All significance tests conducted by means of the Wald F test statistic. .

* $p \leq .10$, ** $p \leq .01$, *** $p \leq .001$

Table 2. Prevalence of Sexual Behavior in Puerto Rican Adolescents (11-18 years) by sex from the Community Sample

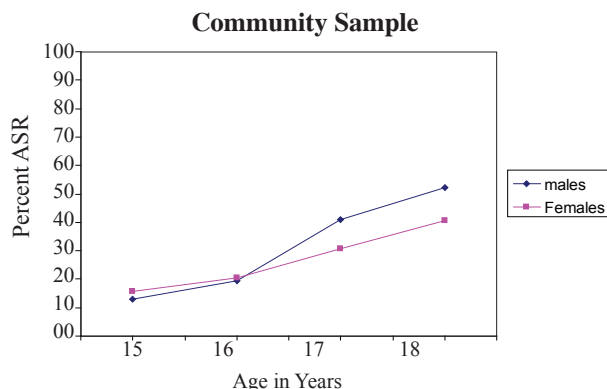| Total	SE	Males	SE	Females	SE
Lifetime Sex[a] (N=980)[§]	15.12%	(1.58)	15.44%	(2.16)	14.80%	(2.23)
Lifetime ASR-I (N=980)	14.79%	(1.57)	15.33%	(2.16)	14.24%	(2.21)
Type of sex						
Genital (N=153)	97.12%	(1.41)	97.94%	(1.53)	96.25%	(2.39)
Anal (N=153)	16.97%	(3.78)	23.73%	(6.70)	9.81%	(4.34)
Average Age of Onset of ASR-I (N=149)	15.22	(0.27)	15.01	(0.52)	15.45	(0.21)
Risky Sexual Behavior (RSB)	71.27%	(5.24)	71.27%	(6.67)	71.27%	(7.41)
Average # of sexual partners (N=149)	2.69	(0.36)	3.31	(0.41)	2.00	(0.62)
Use of contraceptives (N=149)	49.62%	(6.20)	59.60%	(10.28)	38.72%	(8.11)
Consequences of ASR-I						
Pregnancy						
Ever pregnant[b] (N=148)	16.50%	(4.50)	8.70%*	(3.90)	25.29%*	(7.22)
Pregnancy Test[c] (N=58)	45.50%	(8.55)			45.50%	(8.55)
Average # of pregnancies[d] (N=29)	1.13	(0.07)	1.11	(0.11)	1.14	(0.10)
Average # of childbearing[e] (N=29)	.80	(0.11)	.99	(0.14)	.73	(0.13)
Wish of pregnancy (N=29)	46.01%	(13.11)	32.13%	(18.16)	51.41%	(15.42)
STIs (N=149)	1.94%	(1.26)	0.0%	(0.00)	4.05%	(2.62)

Note: ASR-I= adolescent sexual relations with intercourse; STIs= sexually transmitted infections Sample size varies accordingly to whether the item was asked of the whole sample or a subset of the same. Entries on table are weighted percentages for categorical variables and weighted means for continuous variables. Entries with different subscripts are significantly different using the Chi-Square test statistic for categorical variables and the t- statistic for continuous measures. * $p < .05$ [§] Due to missing data analysis were conducted with 980 out of 994 eligible children. [a] Any type of Sexual Relationships with or without Intercourse. [b] Boys were asked if they had gotten anybody pregnant. [c] Only girls were asked this question. [d] Boys were asked how many girls have gotten pregnant. [e] Boys and Girls were asked how many biological children they have.

Table 3. Prevalence of Sexual Behavior in Puerto Rican Adolescents (11-18 years) by sex from the Mental Health Clinic*s*

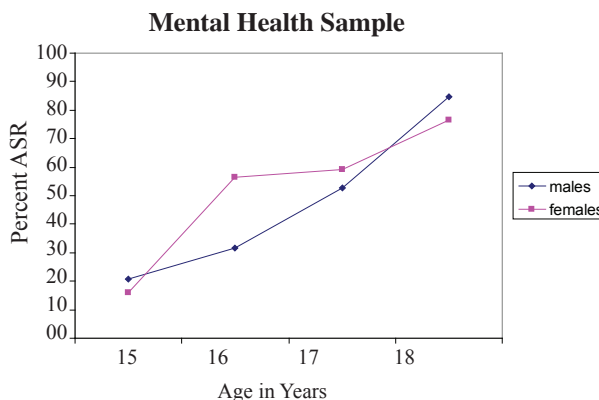|	Total	SE	Males	SE	Females	SE
Lifetime Sex [a] (N=519)[§]	30.25%	(1.57)	28.74%	(1.92)	34.02%	(3.55)
Lifetime ASR-I (N=519)	29.10%	(1.56)	27.42%	(1.87)	33.34%	(3.56)
Type of sex						
Genital (N=156)	92.74%	(2.03)	92.44%	(2.45)	93.37%	(3.53)
Anal (N=156)	30.84%	(3.51)	38.42%***	(4.43)	14.74%***	(4.78)
Average Age of Onset of ASR-I (N=150)	14.23	(0.18)	14.29	(0.23)	14.11	(0.27)
Risky Sexual Behavior (RSB)	86.46%	(2.74)	85.10%	(3.40)	89.28%	(4.41)
Average # of sexual partners (N=150)	3.35	(0.23)	3.86**	(0.32)	2.30**	(0.35)
Use of contraceptives (N=150)	54.71%	(3.70)	59.95%*	(4.29)	43.89%*	(6.67)
Consequences of ASR-I						
Pregnancy						
Ever pregnant [b] (N=148)	27.92%	(3.52)	19.42%***	(3.69)	45.68%***	(6.67)
Pregnancy Test [c] (N=49)	64.66%	(6.49)			64.66%	(6.49)
Average # of pregnancies [d] (N=41)	1.27	(0.07)	1.21	(0.09)	1.33	(0.10)
Average # of childbearing [e] (N=41)	.68	(0.09)	.59	(0.12)	0.76	(0.13)
Wish of pregnancy (N=41)	54.04%	(7.48)	38.67%*	(9.88)	67.70%*	(9.54)
STIs (N=150)	0.00%	(0.00)	0.00%	(0.00)	0.00%	(0.00)

Note: ASR-I= adolescent sexual relations with intercourse; STIs= sexually transmitted infections. Sample size varies accordingly to whether the item was asked of the whole sample or a subset of the same. Entries on table are w eighted percentages for categorical variables and weighted means for continuous variables. Entries with different subscripts are significantly different using the Chi-Square test statistic for categorical variables and the t statistic for continuous measures. * p < .05, ** p < .01, *** p < .001   [§] Due to missing data analysis were conducted with 519 out of 550 eligible children.   [a] Any type of Sexual Relationships with or without Intercourse.   [b] Boys were asked if they had gotten anybody pregnant.   [c] Only girls were asked this question.   [d] Boys were asked how many girls have gotten pregnant.   [e] Boys and Girls were asked how many biological children they have.

Results indicated that ASR-I was significantly higher in the clinical sample for both males (z = 4.25, p ≤.0001) and females (z = 4.56, p ≤.0001). Females in the clinical sample had an earlier onset of ASR-I (z = 3.92, p ≤.0001); yet males in both samples had similar ages of onset. For either gender, there were no statistically significant differences across samples in the use of contraception and

Mental Health Sample

Figure 2. Prevalence of ASR-I by age and gender for the mental health sample

Community Sample

Figure 1. Prevalence of ASR-I by age and gender for the community sample

in the average number of sex partners. However, males in the clinical sample had a significantly higher rate of impregnation (z = 2.00, p ≤.05) and females reported a higher rate of lifetime pregnancy (z = 2.07, p   ≤.05).

Figures 1 and 2 present the prevalence rates of ASR-I by age and gender for the community and clinical samples. In the community sample (Figure 1), there was a linear trend of gradually increasing prevalence of ASR-I for both males and females. By the age of 18, approximately 46% of the sample had engaged in ASR-I. Gender contrast performed at each age failed to show any significant differences between males and females. In the clinical sample (Figure 2), an increase was also observed in the prevalence of ASR-I by age but the trend for each gender did not appear to be linear. By the age of 18 years, 82.36%

of the sample had engaged in ASR-I. Gender contrasts conducted at each age showed a statistical tendency at 16 years (Wald F =3.55, p = .06) where females had a higher rate of ASR-I than males. At all other ages the rates of ASR-I were similar for males and females.

Across sample contrasts were conducted to compare the rate of ASR-I for each gender and age combination with its counterpart in the other sample. For males, there were no statistically significant differences until 18 years of age, where males in the clinical sample had a higher rate

of ASR-I. As in the community sample, for each one year increase in age, youths were 2.12 times as likely to have experienced ASR-I. In addition, youths with higher parental monitoring and/or parental involvement had a lower probability of ASR-I. For each one unit increase in the respective scales, the odds of ASR-I were reduced by a factor of 19% and 5% respectively. Having a psychiatric diagnosis was not predictive of ASR-I in this sample.

An additional analysis was conducted using logistic regression to predict ASR-I using as predictor variables

Table 4. Logistic Regression of Adolescent Sexual Relations on Demographics and Parent-Child Relationship Characteristics

Predictor	Community (n=994)[a]		Mental Health (n=550)[b]	
	AOR	95% CI	AOR	95% CI
Gender				
Male	1.00		1.00	
Female	0.74	(0.42-1.31)	1.34	(0.75-2.41)
Age	2.35***	(1.96-2.82)	2.12***	(1.79-2.51)
PCT Civil Status				
Married	1.0		1.0	
Not Maried	1.35	(0.70-2.60)	1.70	(0.98-2.94)
Religious Practice (Wave 1)				
No	1.0		1.0	
Yes	0.66	(0.38-1.17)	0.80	(0.44-1.44)
Any diagnosis (Wave 1)				
No	1.0		1.0	
Yes	2.73*	(1.22-6.09)	1.59	(0.90-2.81)
Parental Monitoring (Wave 1)	0.88	(0.71-1.09)	0.84*	(0.74-0.97)
Parent Child Attachment (Wave 1)	0.91**	(0.85-0.98)	0.99	(0.94-1.06)
Parental Involvement (Wave 1)	1.02	(.98-1.06)	0.95**	(0.91-0.99)

Note. AOR=adjusted odds ratio; 95%CI=95 % confidence interval[a] The logistic regression model was estimated with 813 subjects, 129 cases were omitted because they were not administered the DISC-IV at wave 1 according to the study protocol because of their age. In addition 52 subjects had missing data on one or more of the variables included in the analysis. The logistic regression model was estimated with 414 subjects, 68 cases were lost because they were not administered the DISC-IV at wave 1 according to study protocol because of their age. In addition 68 subjects had missing data on one or more of the variables included in the analysis. All significance tests conducted by means of the Wald F test statistic. *p d" .05, **p d" .01, ***p d" .001

of ASR-I (z = 2.57, p ≤.01); however, for females, there were statistically significant differences at 16 (z = 2.70, p ≤.01), 17 (z = 2.29, p ≤.05), and 18 (z = 3.23, p ≤.01) years of age. Females in the clinical sample consistently had higher rates of ASR-I at each of those ages.

Table 4 presents the result of fitting multiple logistic regression models to predict ASR-I for each sample. For the community sample, there were three significant predictors of ASR-I: age, any diagnosis and parent-child attachment. For each one year increase in age, youths were 2.35 times as likely to engage in ASR-I. Those with a psychiatric diagnosis were almost three times as likely to have experienced ASR-I. Those with higher parent-child attachment were less likely to have engaged in ASR-I. The odds were reduced by a factor of approximately 10% for each one unit increase in the scale.

In the clinical sample there were also three predictors

the diagnostic umbrella categories of any depressive, any disruptive or any anxiety disorder (data not shown). In these analyses, age and gender were included in the model as adjustment variables. In the community sample, having either a depressive disorder (Wald F = 7.44, p ≤.01) or a disruptive disorder (Wald F = 7.45, p ≤.01) were predictive of a higher probability of engaging in ASR-I. Those with a disruptive disorder were 3.28 times as likely and those with a depressive disorder were 6.03 times as likely to engage in ASR-I. A similar analysis for the clinical sample was conducted and it was found that those having a depressive disorder (Wald F = 4.77, p ≤.05) were 2.34 times as likely to participate in ASR-I.

Due to the high prevalence of RSB among those indicating ASR-I for both samples, a separate set of logistic regression models was conducted to predict RSB (data not shown). For the community sample, the same

predictors that were significant for the ASR-I model were similarly significant in this regression (age, any diagnosis and parent-child attachment) with the addition of parental monitoring. Youth with higher parental monitoring had a lower probability of engaging in RSB. In the clinical sample, the same trend occurred where the same three predictors of ASR-I were also predictors of RSB (age, parental monitoring and parental involvement). Any diagnosis was identified as an additional predictor. Even among a clinical sample, adolescents with a psychiatric diagnosis were 1.73 times as likely to engage in a RSB. Therefore, age, any diagnosis and parental monitoring were predictors of RSB in both samples.

Discussion

When compared to study findings from other developed and developing countries (1), the present data showed an earlier average age of onset of ASR-I in both samples (community=15.2 years old; clinical=14.2 years old). This finding, coupled with the fact that most of these adolescents did not use contraceptives, is probably related to the high prevalence of adolescent pregnancies in PR, which reached 19.2% in 2002 (35), and is the highest of any US jurisdiction (36). No sex difference was found in the onset age of ASR-I within both samples. This finding differs from what has been reported in other countries (e.g., US, Dominican Republic, Brazil) where males initiate ASR-I earlier than females (37, 6, 2). When comparing age of onset and prevalence in both samples, we found that female adolescents in the clinical sample started ASR-I at a significantly earlier age than those of the community sample suggesting a higher vulnerability and frequency of ASR-I in the clinical sample. Factors such as social pressures and sexual coercion by male partners might play an important role in this behavior. The trend of an earlier menarche age during the past 20 years might be an additional factor to consider (38). One of the most interesting findings of this investigation was the absence of significant gender differences within each of the study samples in the lifetime prevalence of ASR-I. This contrasts with previously reported findings, especially in Latino subjects, which have shown a higher prevalence of ASR-I among male adolescents as compared to females (39, 37, 5, 40, 2, 41). Factors such as a higher ratio of female adolescents married or living together with a male partner in PR as compared to males (4.6 times higher during ages 15 to 17 and 2.9 times higher during ages 15 to 19) might account for this lack of difference (42). This tendency of female adolescents to become involved in a formal relationship three to four years prior to their male counterparts is consistent with studies of adolescents in

other countries (43, 2). As indicated by Feldman, Turner, and Araujo (44), factors such as contraceptive availability and the feminist movement recognizing female's sexual expression, desire and gratification, as well as openly acknowledging female sexuality in ways similar to males, might be considered as an explanation for this trend. Recent studies carried out on the island have also shown no gender differences in the rates of substance use disorders among young adults (18 to 25 years) (45) when, in the past, significant differences were observed between males and females in the rates of substance use disorders (46-47).

The clinical sample doubled the community sample with regard to lifetime ASR-I (29.10% and 14.79%, respectively) in the sample of adolescents between ages 11 to 18. A study by Rodríguez, Moscoso, Parrilla, and Rebollo (48) showed a similar lifetime prevalence of 18.1% in a school sample of students from 7th to 12th grade. Notwithstanding, when disaggregating the prevalence of ASR-I by age, the clinical sample reported 4.34% for youth 11 to 14 years and 53.88% for youth 15 to 18 years of age. In the community sample, the results also showed a dramatic increase by age (1.16% for 11 to 14 years vs. 29.26% for 15 to 18 years). Therefore, being older became the strongest of all predictors of ASR-I in both samples. The increase in the rate of ASR-I with increased age was previously reported by YRBSS (8).

While the community sample showed no gender difference on most of the variables in the present study (type of sex, average age of onset, RSB and consequence of ASR-I), the clinical sample showed significant gender differences with respect to several variables. The finding that more male adolescents engage in anal sex might indicate that males are engaging in ASR-I with other males, either peers or older, and more experienced, homosexual men (13, 49) and/or with adult women. Anal intercourse may occur as part of exploration for heterosexual teenagers, for self-identified gay youth, for pleasure or to please partners (13, 50). It might also represent a means for preserving "virginity" and preventing unwanted pregnancies. Another possibility for the gender difference observed in anal intercourse is that, within a socio-cultural context, this type of behavior is considered more inappropriate for females than males; therefore, under-reporting anal sex might be higher in females than in males.

Within the clinical sample, males had more sexual partners, used contraceptives more frequently, and had a lower wish of pregnancies. Although under-reporting of this behavior by females is the most plausible explanation, these findings might also be related to theories documenting that in some developed and developing

countries males perceive more risk of unplanned pregnancy and unprotected sex than females (43). In addition, there is evidence that typical Latino females show a submissive, passive and dependent attitude in their sexual interactions with men (51). As shown by more recent data, this attitude is particularly evident when females negotiate the use of condoms with their male partners (52).

When contrasting clinical and community samples by gender, we found no significant differences in the number of sexual partners and the use of contraceptives between samples. However, in the clinical sample, males had a higher rate of impregnation while females showed an earlier onset of ASR-I and a higher rate of pregnancy. Both genders had higher prevalence of ASR-I than the community sample. These data confirm the results from other studies that have found emotionally disturbed adolescents more likely to engage in RSB than those in the general population (13, 16, 15, 17, 20). These studies also demonstrated that emotionally disturbed adolescents were more likely to engage in promiscuous sexual behavior, had more frequent sexual activities, used fewer condoms and had a higher lifetime prevalence of pregnancy and STIs than normal controls. More than half of the adolescents who were treated for STIs were previously diagnosed for a psychiatric condition and 85% of HIV patients also had a psychiatric diagnosis (20).

Age, any psychiatric diagnostic and parent-child attachment were ASR-I predictors for the community sample whereas age, parental monitoring and parental involvement were predictors of ASR-I in the clinical sample. In both samples, parent-child relationships emerged as a powerful predictor of having less ASR-I. This finding supports previous studies that stress the importance of the parent-child relationship in the prevention of adolescent's sexual onset and RSB (53-54, 15, 21, 55-56, 22, 57). Furthermore, they emphasize the transcendence in parent-child relationship of communication qualities such as frequency, specificity, openness, and comfort. On the other hand, Crosby, DiClemente, Wingood, Lang, and Harrington (58) suggested that lack of parental involvement predicted an increased risk of STIs among teenage girls. Likewise, Donenberg et al. (15) pointed out that parental hostile control was highly associated with an early sexual debut in adolescence. The variable of any psychiatric diagnosis also emerged as a significant predictor of ASR-I in the community sample (p ≤.05) and again in both samples when predicting RSB (data not shown).

Logistic regression models were conducted in order to evaluate the relationship between diagnostic groups and ASR-I. While any depression became a predictor of ASR-I for both samples, any disruptive disorder predicted ASR-I only in the community group. Once again, as reported by previous studies, it was observed that depression in adolescents was significantly associated with ASR-I (18).

In both samples, females reported a significantly higher number of pregnancies than males reported impregnating their sexual partners. Denial of male adolescents in accepting paternity and silence from females, along with denial and fear to affix paternity to a particular partner, who is usually a few years older, might explain these results (2). While some authors indicated that the majority of pregnancies among unmarried teenagers are unintended and unwanted, (59-60) our study showed that almost half of the adolescents who were pregnant in both samples expressed their wish for pregnancy. Puerto Rico has one of the highest rates of unmarried teenage pregnancies. As Bonell et al. (61) reported, having a baby may represent a positive goal for those adolescents who dislike school and are part of a socio-economic disadvantaged group. This finding suggests the need for prevention programs that address adolescents' attitudes toward pregnancy, knowledge and adoption of effective contraceptive methods, and awareness of the bio-psychosocial implications of out of wedlock childbearing at an early age.

The prevalence of STIs reported by both samples of this investigation was almost nil (4 in 299 subjects). This finding contrasts with Upchurch, Mason, Kusunoki, and Kriechbaum (62) who pointed out that, according to the CDC (63-64), 25% of STIs in the US is accounted for by adolescents, with a prevalence of approximately 16% for female adolescents and 8% for males. These authors stressed that, the earlier the onset of ASR-I, the higher the prevalence of subsequent STIs acquisition. Fiscus, Ford, and Miller (65) indicated that absence or inadequate screening of STIs, especially in young adolescents, might be one of the reasons for under-reporting STIs amongst this population. It is also possible that underestimates of STIs might be due to the fact that data were obtained by face-to-face individual interviews within the home environment where complete anonymity of the STIs report might not have been possible. There is evidence that sensitive behaviors such as drug use are under-reported in face-to-face interviews as compared to self-administered anonymous reports (66-67).

Similar to previous study reports (68-71), and although not significant in the multiple logistic models used in this investigation, bivariate analyses performed showed that socio-demographic variables such as living with both parents and engaging in religious practices were related to a lower prevalence of ASR-I. DuRant, Pendergrast, and Seymore (72) pointed out that church affiliation and

involvement, and family structure were associated with adolescents not becoming sexually active. Likewise, a higher prevalence of early ASR-I was observed in disruptive families or separated parents.(41). However, it seems that other variables such as psychiatric disorders and parental involvement seem to be more important in explaining ASR-I since these demographic variables were not found to be significant predictors in the multivariate models.

Our results showed that the majority of the community and clinical samples that engaged in ASR-I also engaged in RSB. The almost synonymous results in our study samples between ASR-I and RSB have important clinical implications regarding their coexistence with pregnancy and STIs rates. There is a need to implement adolescent sexual health programs that address RSB and ASR-I within an integrated perspective. It is also necessary to promote more comprehensive, cognitive, emotional, interpersonal skills and sexual education among adolescents in order to facilitate and enhance their critical judgment over their sexual choices and decisions toward improving their sexual health. All professional efforts in the field of adolescent sexuality (e.g., health, education, recreation) should reinforce these goals.

Limitations

The current study presents and analyzes some of the quantitative data gathered during a psychiatric epidemiological study in PR. Since the aim of the original epidemiological study was not specifically related to adolescent sexual behavior, the scope of the data collected on this issue is somewhat limited. Relevant variables such as other forms of sexual expressions and foreplay like: solitary masturbation, oral and/or manual mutual genital stimulation and masturbation and the degree of exposure to sexual education at home or at school, etc. were not available for analysis. This represents a disadvantage in identifying a broad range of sexual behaviors that might be precursors of ASR-I.

Conclusions

Several general conclusions can be drawn from the present study. First, adolescents with mental disorders initiate and engage in ASR-I earlier and more frequently than adolescents from the general community. Second, regardless of gender, older adolescents are more likely to engage in ASR-I. Third, the lack of gender difference in the prevalence of ASR-I in Puerto Rican adolescents contrasts with what has been traditionally reported and still prevails in many other countries. However, it is on par with recent studies that demonstrate that this

difference is vanishing and could represent a future trend. Fourth, the parent-child relationship emerged as a highly relevant predictor of adolescent sexual behavior. Fifth, the almost synonymous results between ASR-I and RSB have important clinical implications regarding increases in the rate of teen pregnancy and in the risk of STIs. Current study findings led its investigators to recommend further investigation in this field since adolescents' sexual development needs to be addressed to a more constructive and positive manner in this stage of life.

Resumen

Las relaciones sexuales coitales entre adolescentes (RSC-A) y la alta prevalencia de adolescentes embarazadas (19.2%, 2002) constituyen serios problemas bio-psicosociales en Puerto Rico. El estudio de consecuencias y correlatos de RSC-A en muestras de comunidad (MC) y de participantes de servicios de salud mental (MSM) es importante para el diseño e implantación de programas de salud sexual para adolescentes. Muestras aleatorias y de corte transversal de varones y hembras de 11-18 años involucrados en RSC-A (N=994, MC, N=550, MSM) fueron los sujetos del estudio. Datos demográficos, familiares, sexuales y del DISC-IV fueron recopilados mediante entrevistas individuales. El análisis estadístico utilizó modelos de regresión logística, Chi² y pruebas t. La muestra MSM demostró una prevalencia mayor de RSC-A en hembras y del número de embarazos y una edad más temprana al inicio de RSC-A. No hubo diferencias de género de RSC-A en las muestras. En la MC, adolescentes mayores con diagnóstico psiquiátrico y con menor supervisión de los padres, tendían a involucrarse más frecuentemente en RSC-A. En la MSM, los adolescentes con menor supervisión e involucramiento de padres demostraron una tendencia significativamente mayor de involucrarse en RSC-A. La prevalencia de RSC-A y conducta sexual riesgosa (CSR) resultó casi idéntica. Irrespectivo del género, los adolescentes con desórdenes mentales se iniciaron e involucraron en RSC-A más temprano y más frecuentemente. Adolescentes mayores mostraron mayor tendencia a involucrarse en RSC-A. Las relaciones padre-hijo emergieron como predictor muy relevante de conducta sexual adolescente. La alta correspondencia entre RSC-A y CSR tiene importantes implicaciones clínicas.

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