

Initiation of heterosexual activity among adolescents in rural Jamaica: the influence of family factors.

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Abstract

The objective of this study was to identify individual and family level factors associated with initiation of sexual activity among adolescents in rural Jamaica. We analyzed data for a sample of 748 students attending public high schools in the parish of Hanover, Jamaica, who completed a survey containing questions on age, gender, leisure activities, type of school attended, family structure, communication with parents on sexual matters, and parental monitoring of adolescent activities. Multivariate logistic regression was used to determine the association of these variables with sexual experience. 62.7% of participants were sexually experienced. For females sexual experience was associated with lack of parental monitoring [Odds ratio (OR) = 1.20; 95% confidence interval (CI) = 1.07-1.35], while living with both biological parents delayed initiation of sexual activity (OR=0.45; 95% CI = 0.30-0.67). For males lack of parental monitoring (OR=1.19; 95% CI = 1.01-1.39) was a significant predictor of sexual experience. In this environment with high rates of adolescent pregnancy, intervention programs must recognize the influence of family factors on initiation of sexual activity and implement a broad-range prevention strategy that will involve the parents.

Keywords: Sexual experience; adolescence; family factors; rural Jamaica

Introduction

Globally, initiation of sexual activity among adolescents has become a public health concern as a result of the continued decline in the age of sexual debut - the timing of first sexual intercourse (Centers for Disease Control and Prevention (CDC), 1998), as well as the risks associated with sexual activity (Santelli, DiClemente, Miller, & Kirby, 1999; Coker, Richter, Valois, McKeown, Garrison, & Vincent, 1994). Research findings in the United States revealed that almost one half of teenagers have had sexual intercourse and they do so at an earlier age than previous generations (CDC, 1998; Coker, Richter, Valois, McKeown, Garrison, & Vincent, 1994).

Engagement in sexual activity is the most important determinant of pregnancy and acquisition of sexually transmitted infections including Human Immune Deficiency Virus (HIV). Understanding the factors that predispose adolescents to early sexual intercourse is therefore crucial in mounting programs to delay sexual intercourse. Several studies from developed countries have reported the characteristics of teenagers who had engaged in sexual intercourse (Hansen, Mann, McMahon, & Wong, 2004; Small, & Luster, 1994; Meschke, & Silbereisen, 1997). Factors at the individual level and environmental level, including family, peer group, school, and the neighborhood, have been suggested as key determinants of adolescent behavior including sexual initiation (Bronfenbrenner, 1989). The importance of these factors however, varies with the setting and the population studied.

In Jamaica for instance, adolescent sexual activity and pregnancy have been associated with poverty, low educational levels, the absence of male role models in the home, and a social milieu where premarital sexual relations and childbearing are both culturally reinforced and penalized (Barnet, Eggleston, Jackson, & Hardee, 1996; McNeil, Olfason, Powell, & Jackson, 1983). Typical Jamaican families are female-headed. Many parents leave the

island to seek employment overseas leaving children with inadequate guidance and protection (United Nations Children Fund (UNICEF), 2002). The high rates of migration, have contributed to the weakening of the family and community support structures. However, the impact of this family dispersal on adolescent sexual activity has not been supported with empirical evidence (Jackson, Leitch, Lee, Eggleston, & Hardee, 1998).

The objective of this study was to identify socio-demographic and family factors associated with sexual activity among adolescents in rural Jamaica, using the social ecological systems model as explicated by Bronfenbrenner (1979). Based on this theoretical assumption and the reported findings in the literature, we hypothesized that family factors will influence adolescents' initiation of sexual activity.

Methods

Sample Selection and Field Procedure

This study is a secondary analysis of data collected in the summer of 1998 for the "Hanover Teen Study" (Stallworth, Roofe, Clark, Ehiri, Mukherjee, Person, & Jolly, 2004). The Hanover Teen Study was based on a cross-sectional survey of rural adolescent males and females attending different types of high schools in the parish of Hanover, Jamaica, to identify factors associated with adolescent sexual activity in the parish. A multi-stage sampling technique yielded 788 students who participated in the study. First, Hanover the most rural parish among other rural parishes in Jamaica was selected for this study. Next, schools in the parish were divided into two groups: (1) comprehensive (formerly new secondary) schools and (2) secondary high/technical high /agricultural high schools, based on methods of student admission. Students who performed well in the National Assessment Examination taken at the final class in elementary school attend academically rigorous secondary high school and technical high schools which prepare them for college. On the other hand, admission to new secondary (now comprehensive high schools), providing a mixture of academic and vocational training, is gained from feeder schools and those who did not perform well on the National Assessment Examination. Students who attend these schools have little chance of continuing their education beyond the secondary level (Eggleston, Jackson, & Hardee, 1999).

To identify any potential problem in the comprehension of the survey by the target population, it was pilot-tested using fifty students from one of the schools that was not part of the study. These students and their parents were asked to give their informed consent before participating in the pre-testing, and they were asked to complete an evaluation form. Based on the results of the pre-testing and review of the evaluation forms, the investigators were able to identify that many young adolescents could not read well enough to complete a self administered questionnaire (Stallworth et al., 2004).

Documentation of parental consent was obtained from the students before their participation. Informed consent was also obtained from the students and a copy was made available for each of them to take home. Participants were informed that they were free to decline to answer any question that would cause them discomfort, and that they had the right to terminate their participation in the study at any point. Investigators read the questions and the possible responses aloud to the participants on the day of the administration of the survey.

The surveys were completed at each school site in a large classroom under the supervision of the study staff to prevent participants from sharing information on their response to the questions. No teacher or any other school personnel were present during the time the survey was administered to avoid any influence on the students' responses. Data obtained during this survey was assessed for completeness and consistency and was entered into the Statistical Package for the Social Sciences (SPSS) database. The Institutional Review Board (IRB) at the University of Alabama at Birmingham (UAB), and the Ethics Committee, Ministry of Health, Jamaica, approved the protocol for this study prior to implementation.

Instruments and Measures

The survey instrument was developed based on a comprehensive literature review on factors associated with adolescent sexual activity and was guided by the Bronfenbrenner's Social Ecological Model (Bronfenbrenner, 1979). The self-report questionnaire included questions on socio-demographic and family context variables.

Socio-demographics

Socio-demographic data was collected on variables such as current age, gender, type of school attended, family structure, and adolescent leisure (after school) activities. Type of school attended in this study is defined as comprehensive versus other high schools (secondary high, technical, and agricultural). Questions on leisure activities such as going straight home after school, hanging out (spending time) with classmates, and hanging out with girlfriend/boyfriend were answered "yes or no".

Table 1: Comparison of individual and family characteristics of participants by sexual experience

Characteristic, N (%) or mean \pm SEM ¹	All N= 748	Sexual experience		p-value
		Yes N=469	No N=279	
Socio-demographic				
Age at time of survey	16.3 \pm 0.04	16.5 \pm 0.06	16.0 \pm 0.06	<0.0001
Female	484 (64.7)	258 (55.0)	226 (81.0)	<0.0001
Attending comprehensive high school	545 (72.9)	321 (68.4)	224 (80.3)	<0.0001
Goes straight home after school	559 (74.7)	335 (71.4)	224 (80.3)	0.007
Hangs out with classmates	264 (35.3)	179 (38.2)	85 (30.5)	0.03
Hangs out with boyfriend or girlfriend	177 (23.7)	139 (29.6)	38 (13.6)	<0.0001
Family				
Discuss sexual matters with parents	481 (64.3)	289 (61.6)	192 (68.8)	0.05
Living with both parents	312 (41.7)	169 (36.0)	143 (51.3)	<0.0001
Parental monitoring ²	5.7 \pm 0.1	6.0 \pm 0.1	5.2 \pm 0.1	<0.0001

¹Standard error of the mean

²A sum of scores of three items representing parental monitoring (higher score represent lack of parental monitoring)

Family Context Variables

Family structure was measured by whether the adolescent lived in an intact two-parent household or not. We defined intact family as married biological parents living in the same household with the adolescent. Adolescents were asked to answer “yes or no” if their parents discuss sexual issues with them.

Parental monitoring and supervision of adolescent activities was measured on three levels: the extent to which parents know their child’s whereabouts, how much interest they show in who they spend time with, and what they do during their free time. A sample question for the first category is “My parents know where I go after school and weekends”. Response options range from 1 (all the time) to 5 (none of the time). A composite variable based on the sum of these three items was constructed to determine the level of parental monitoring of adolescents’ activities by the parents. A high score on this scale is considered as lack of parental supervision/monitoring (Cronbach’s alpha = 0.54)

Outcome Variable

For this study, the outcome of interest is initiation of heterosexual intercourse. We obtained this information from the response of adolescents to the question “Have you ever had sex?” Response options as Yes/No. Those who answered “Yes” were reported as sexually experienced, and those who answered “No” were referred to as sexually abstinent. We defined sex in this study as a penis entering the vagina. Given the sensitive nature of this question and other questions related to sexual behavior, they were asked at the end of the survey, after questions about adolescent’s socio-demographic and family characteristics had been answered.

Sample

The data generated from this study was analyzed for missing responses using the SPSS frequency procedure. Out of the original 788 participants, we excluded 40 (5.1%) with incomplete data on the outcome and key predictor variables from the analysis. For the 748 individuals remaining for analysis, missing data appeared to be randomly distributed across gender groups. In order to enhance statistical power, we replaced missing values for continuous variables by substituting the mean response given by respondents of the same gender. Overall the range of missingness for continuous explanatory variables was between 1.2% and 2.1%. The largest (2.1%) is attributed to age at time of survey.

Statistical Analysis

Frequency distributions were computed for the selected socio-demographic and family characteristics and coital status. Mean values and standard error of the mean (SEM) were calculated for continuous variables. Bivariate association of these characteristics and sexual experience was assessed using Chi-square statistics for categorical variables and t-test for continuous variables. Logistic regressions were performed between the outcome variable and each of the explanatory variables (bivariate) and between the outcome variable with all explanatory variables in the model (multivariate) to estimate crude and adjusted odds ratio (OR) with 95% confidence intervals (CI). In both the bivariate and multivariate analysis, being sexually experienced was the dependent variable. Gender, age, activities engaged in after school, the type of school attended, family context measures such as family structure, parental monitoring, and discussion of sexual issues with parents were the explanatory variables. All covariates were entered into the multivariate regression model. In the final model, insignificant variables were eliminated using stepwise and

backward strategy with a 10% cut-off margin. Variables in the final model were fitted for each gender to assess effect modification. All tests were two-tailed, and a p-value of 0.05 or less was considered as statistically significant. The Nagelkerke R-square (R^2) statistics was used to measure the strength of the association predicted by the final model. All Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS 14; SPSS Inc., Chicago, Illinois).

Table 2: Unadjusted and adjusted estimates of association of individual and family characteristics of participants with sexual experience

Characteristic	Unadjusted (N=748)			Adjusted ³ (N= 748)		
	OR ¹	95% CI ²	p-value	OR	95% CI	p-value
Age at time of survey in years	1.5	1.31-1.74	<0.0001	1.6	1.29-1.88	<0.0001
Female vs. male	0.3	0.20-0.41	<0.0001	0.3	0.17-0.38	<0.0001
Comprehensive high school vs. others	0.5	0.37-0.76	<0.0001	1.1	0.68-1.82	0.68
Goes straight home after school	0.6	0.43-0.88	0.007	0.9	0.61-1.41	0.71
Hangs out with classmates	1.4	1.03-1.93	0.03	1.1	0.77-1.64	0.54
Hangs out with boyfriend or girlfriend	2.7	1.80-3.97	<0.0001	2.0	1.25-3.06	0.003
Discuss sexual matters with parents	0.7	0.53-1.00	0.05	1.0	0.68-1.38	0.87
Living with both parents	0.5	0.40-0.72	<0.0001	0.5	0.36-0.70	<0.0001
Parental monitoring	1.3	1.17-1.39	<0.0001	1.2	1.08-1.30	0.001

¹OR: Odds ratio ²CI: Confidence Interval. ³Adjusted for all characteristics listed in this table.

Results

Descriptive Analysis

Of the 748 participants included in analysis approximately two-thirds (65%) were females, with age ranging from 14-19 years. The mean age of participants was 16 years and almost two-thirds (63%) were sexually experienced. Among males 80% were sexually experienced, while 53% of females had initiated sexual intercourse. On average, sexually experienced teens were older than their sexually abstinent peers (16.5 years and 16.0 years respectively). Mean age at sexual initiation was 14 years (11 years for males and 15 years for females). The majority of the adolescents (73%) were attending comprehensive high schools, while the rest were secondary high, technical, and agricultural high school students. The proportion of sexually experienced adolescents who reported discussing sexual issues with their parents was less than the proportion for sexually abstinent adolescents (62% vs. 69%). Less than half (42%) of the students reported living in intact two-parent households with their biological parents. Of those who lived with their parents only 36% were sexually experienced. Adolescents who were sexually experienced had higher mean scores on the parental monitoring scale (6.0 ± 0.1), compared to those who had yet to initiate sexual activity (5.2 ± 0.1). Table 1 summarizes the results for the associations of various predictor variables and coital status.

Regression Analysis

At the bivariate level all characteristics examined were significantly associated with sexual debut ($p \leq 0.05$). When all of the variables were entered into a multivariate analysis only age, gender, hanging out with boyfriends/girlfriends, family structure, and lack of parental monitoring remained significant ($p < 0.05$). Unadjusted and adjusted odds ratios for these variables are presented in Table 2. The effect of key variables such as age, gender, family structure, and parental monitoring were not confounded by other covariates included in the model, as the crude and adjusted odds ratio for these variables did not differ appreciably from each other.

The result of the final predictive model and the assessment of effect modification are presented in Table 3. All variables that were significant at the multivariate level remained significant in the overall final model. The role of hanging out with boyfriend or girlfriend as risk factor for initiation of sexual activity was substantially modified by gender. Transition to sexual activity among girls correlated significantly with older age (OR= 1.54, CI= 1.29-1.84), hanging out with boyfriends (OR= 2.27, CI= 1.37-3.76), and lack of parental monitoring (OR= 1.20, CI= 1.07-1.35). Living in the same household with both parents was a protective factor among females (OR= 0.45, CI= 0.30-0.67). For boys, being older (OR= 1.47, CI= 1.07-2.02) and lack of parental monitoring (OR= 1.19, CI= 1.01-1.39) were significant predictors of initiation of sexual activity. The overall predictive efficacy of the final model was 24%.

Table 3: Final model predicting initiation of sexual intercourse stratified by gender

Characteristic	Overall (N=748)			Male (N=264)			Female (N=484)		
	OR ¹	95% CI ²	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Female	0.26	0.18-0.37	<0.0001	-	-	-	-	-	-
Age at time of survey	1.51	1.30-1.76	<0.0001	1.47	1.07-2.02	0.02	1.54	1.29-1.84	<0.0001
Hangs out with boyfriend or girlfriend	2.06	1.35-3.17	0.001	1.64	0.74-3.64	0.22	2.27	1.37-3.76	0.001
Living with both parents	0.50	0.36-0.70	<0.0001	0.61	0.33-1.14	0.12	0.45	0.30-0.67	<0.0001
Parental monitoring	1.19	1.08-1.31	<0.0001	1.19	1.01-1.39	0.04	1.20	1.07-1.35	0.002
Model statistics		0.24*			0.09*			0.20*	
Nagelkerke R ²									

¹OR: Odds ratio ²CI: Confidence Interval. *R² change is based on Nagelkerke's statistics.

Discussion

The primary objective of this study was to identify individual and family level factors associated with teenage sexual activity in rural Jamaica. Our results show gender differences in the predictors of sexual experience. A greater number of factors significantly predict sexual activity for females than males. Four of the predictor variables were found to be significant for females, while only two were significant for males. Fewer predictors of transition to sexual intercourse were reported by Small and Luster for male compared to female adolescents in their study of adolescent sexuality among US high school students (Small & Luster, 1994). Girls who had initiated sex were strongly influenced by both individual and family factors. This is in agreement with previous studies that combined individual and family variables (Werner-Wilson, 1998). Understanding these differences can help in the planning of intervention programs to delay adolescent sexual activity.

Overall, the data supported the predicted association between family characteristics and adolescent sexual activity. Sexually experienced female adolescents were less likely to reside with their biological parents. These findings confirmed earlier statements with regards to the Jamaican family (McNeil et al., 1983; UNICEF, 2002), and are consistent with previous research on the effect of family structure on initiation of sexual intercourse (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005; Santelli, Lowry, Brener, & Robin, 2000). Compared to living in single-parent house-hold, living with both parents has been reported to be associated with less sexual activity, especially among adolescent girls (Davis & Friel, 2001), a situation that has been linked to the stable social, emotional, and economic support that two-parent households provide (Young, Jensen, Olsen, & Cundick, 1991). The absence of the father in most homes could also explain the gender difference in our study. The absence of the father has been reported to place girls at special risk for early sexual activity (Ellis, Bates, Dodge, Fergusson, Horwood, Pettit, & Woodward, 2003; Dittus, Jaccard, & Gordon, 1997). Paternal disapproval of premarital sex has been suggested as a possible mediating pathway for this association (Ellis et al., 2003; Dittus, Jaccard, & Gordon, 1997; Loewenson, Ireland, & Resnick, 2004).

An important finding that was not modified by gender status in this study was the association between parental monitoring and initiation of sexual intercourse. Consistent with previous studies, the quality of supervision and monitoring of adolescent activities was associated with sexual experience (Meschke & Silbereisen, 1997; Velez-Pastrana et al., 2005; Sieverding, Adler, Witt, & Ellen, 2005). As suggested by previous authors (Meschke & Silbereisen, 1997; Velez-Pastrana et al., 2005), when parents have knowledge of their child's whereabouts, activities, and friends, it provides them with the opportunity to monitor, and thereby influence the delay in initiation of sexual activity. Monitoring of adolescent activities by parents has been reported to be significantly associated with lower social expectations to have sex (Sieverding et al., 2005).

Another finding that was not impacted by gender was the relationship between age and sexual experience. Sexually experienced adolescent males and females were significantly older than their sexually abstinent peers. This however, is to be expected since the proportion of adolescents that initiate sexually activity increases with age. In Jamaica for

instance, by age 15-19 years, 63% of girls and 83% of boys had been reported to have had sexual intercourse (Adolescent Condom Survey Jamaica, 2001).

Socio-romantic leisure activity (spending time with boyfriends) was predictive of sexual initiation for girls. Previous authors had reported similar findings in their own studies (Meschke & Silbereisen, 1997; Marin, Kirby, Hudes, Coyle, & Gomez, 2006). Probable explanations for this association could be the ample times spend alone with boyfriends. Being alone with a boyfriend could lead to kissing and touching, the experienced pleasurable feelings could heighten curiosity and experimentation with sex (Marin, Kirby, Hudes, Coyle, & Gomez, 2006). In our study, the type of school attended was not independently associated with initiation of sexual intercourse, contrary to what has been generally assumed about the school system in Jamaica (Eggleston et al., 1999).

In order to reduce the risk of sexual activity, adolescents, especially females should be encouraged to delay serious romantic relationships. Based on our findings, we suggest more involvement of parents in the monitoring of their adolescents in order to delay initiation of sexual activity.

Limitations, Implications, and Future Directions

The limitations of the design and data collection require cautionary interpretation of our findings. The study relied on self-reports of adolescent sexual activity. It is probable that adolescents may give socially acceptable answers to matters such as sexual activity, or they may embellish their experience. Steps however, were taken to minimize this effect by entrenching anonymity in the study design, and by not involving the school staff in data collection. Non-response to some questions and the missing data generated are also limitations. The statistical replacement of missing values by using means minimized the effect of power lost due to listwise deletion, but reduced variability and introduced bias. Parental socio-economic status, a key family variable, was not assessed in this study. It is presumed that there will not be much difference in the family socio-economic status of the participants as they all live within a rural setting. Sexual activity in this study was limited only to vaginal sex — the non-inclusion of adolescents who had experimented with oral or anal sex could have underestimated sexual activity other than vaginal intercourse in this population. Finally, the cross-sectional design of this study may be a major limitation as only association, but not causal inferences can be made.

This study was a unique opportunity to study sexual behavior of rural adolescents in Jamaica, who were always underrepresented in previous studies. While the findings may not be representative of all adolescents from different socio-economic and demographic backgrounds in the country, the findings definitely provide insight into the sexual behavior of adolescents within the sub-set of the Jamaican society that was studied. A major strength is the assessment of socio-demographic and family variables at the same time, thereby reducing the number of unmeasured covariates that could bias the reported findings. The multivariate model accounted for 24% of the variations in sexual experience, and cannot be assumed that the factors examined here are the only ones affecting initiation of sexual activity.

This study makes an important contribution to the understanding of factors associated with sexual initiation among rural Jamaican adolescents. Our findings indicate that sexual activity during adolescence is common among rural Jamaican adolescents, with similarities in proportion and predictors to what has been reported among comparable populations in the United States. To delay initiation of sexual intercourse, intervention programs must recognize these factors and implement an all-inclusive prevention strategy that can adequately address the social and cognitive needs of both sexes. As the cost of adolescent pregnancy and sexually transmitted infections is enormous in a developing country like Jamaica, it is imperative that early initiation of sexual activity should be discouraged.

In addition to the ongoing Family Life Education curriculum in Jamaican schools, we recommend a comprehensive approach that is age, gender and developmentally appropriate. Parents, schools, health providers, and the youths themselves should be involved in program design and implementation. The media, religious organizations, and policy makers should also play key roles in the prevention partnership.

Acknowledgements

This work was supported by the Minority International Research Training Grant (#T37-TW00077) awarded to the last author (Dr. Pauline Jolly) by Fogarty International Center, National Institute of Health, and the Ministry of Health, Jamaica. The authors of this article take responsibility for its contents and not the National Institutes of Health or the Ministry of Health, Jamaica. The authors would like to thank the principals and students of the schools in the parish of Hanover, Jamaica who participated in the study.

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