ABSTRACT

In spite of a variety of broad-based interventions, rates of adolescent sexual intercourse remain high. Using data from a large longitudinal study, this paper provides empirical evidence of Canadian adolescent sexual activity rates by age and gender. The incidence of first sexual intercourse among those 13-15 years was higher among males than females; by ages 16-17 years, rates were the same for both genders (25%). Prevalence of sexual intercourse increased with age; by age 16-17 years, similar rates were reported for both genders (approximately 50%). Analysis of data over a three-year period indicated that at each age, over 80% of adolescents reported intermittent or no sexual intercourse. Different factors predicted the absence of early sexual intercourse for the two genders. These data provide useful information about Canadian adolescent sexual activity, particularly related to identifying high risk groups for targeted prevention interventions.

ABRÉGÉ

En dépit d'une variété d'interventions globales, les taux de rapports sexuels chez les adolescents restent élevés. À partir des données d'une importante étude longitudinale, cet article apporte des preuves empiriques des taux d'activité sexuelle chez les adolescents canadiens par âge et par sexe. L'incidence du premier rapport sexuel intervenant entre 13 et 15 ans était plus élevée chez les garçons que chez les filles; à 16-17 ans, les taux étaient les mêmes pour les deux sexes (25 %). La prévalence des rapports sexuels augmentait avec l'âge; à 16-17 ans, les taux étaient les mêmes pour les deux sexes (environ 50 %). Une analyse des données couvrant une période de trois ans a montré qu'à chaque âge, plus de 80 % des adolescents déclaraient n'avoir aucun rapport sexuel ou seulement occasionnellement. Différents facteurs permettent de prédire l'absence de rapports sexuels précoces pour les deux sexes. Ces données apportent des renseignements utiles sur l'activité sexuelle des adolescents canadiens, en particulier pour ce qui est d'identifier les groupes à risque élevé en vue de cibler les interventions de prévention.

Adolescent Sexual Behaviour: Results from an Ontario Sample Part 1: Adolescent Sexual Activity

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In spite of a variety of programs designed to prevent or delay sexual activity among young adolescents, rates of sexual intercourse among this age group remain high. This leaves many adolescents at high risk for unintended pregnancy, sexually transmitted diseases (STDs) and autoimmune deficiency syndrome (AIDS).

Several systematic reviews of the literature evaluating the effectiveness of programs to reduce unprotected sexual intercourse have been reported recently.¹⁻³ They concluded that although some programs appear to be effective for some adolescent groups (e.g., low versus high risk, sexually experienced versus inexperienced, gender and age), the methodological rigour in much of the work is weak.

To maximize program appropriateness and effectiveness, more specific data about the target population's sexual activity and contraceptive/condom use are required. A considerable amount of data about American adolescent sexual activity and contraceptive use are now available. The most recent American data indicate that the 1991 rates for sexual intercourse among adolescents 15-18 years of age were 54% overall, and 39%, 48%, 62%, and 67% respectively for each age.⁴ Results of the Youth Risk Behaviour Survey in 1990,

1991, and 1993 indicate that the number of adolescent secondary school students reporting ever having sexual intercourse remained constant over the four years.⁵

Some information about sexual activity of Canadian adolescents is available. Results of the Canada Youth and AIDS Study⁶ and Canada's Health Promotion Survey 1990⁷ indicate that among those 15-19 years of age, 60% of males and 57% of females have had sexual intercourse. However, no current data about sexual activity by age, age of first sexual intercourse, progression of sexual activity or birth control/condom use have been reported for Canadian adolescents.⁸

In a review of studies examining a number of predictors of adolescent sexual activity, DiCenso¹ identified 78 predictors which she collapsed into 7 categories: demographics, physical development, cognitive development, social interactions, personality traits, other behaviour, and services. Unfortunately, although many predictors have been examined, few have been examined in more than one study.

Using data from a longitudinal study, we were able to calculate the prevalence of sexual intercourse for a large sample of adolescents from a large Ontario urban area by gender and age, the ages of first sexual intercourse (incidence) for males and females, the progression of sexual activity over time, and the rates of birth control/condom use. As well, we were able to establish associations between early sexual activity and a number of individual and family variables. The purpose of this, the first of two papers, is to describe and report the results of the analyses related to sexual activity. The second paper will report the rates of birth control/condom use.

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METHODS

The McMaster Teen Project (MTP) was a randomized controlled trial to evaluate the effectiveness of an educational program in reducing adolescent pregnancy.^{9,10} The target population was students between the ages of 11 and 16 years who were in grades seven and eight in 21 of the 23 public schools in a large Ontario city (population 300,000). After stratification for school size, schools were randomly allocated to the control or experimental group using a random numbers table.

The study provided self-reported data about adolescent sexual activity and birth control/condom use, family functioning, adolescent locus of control, family ethnicity, and maternal and paternal educational levels before the intervention (November 1984) and annually for five years (April, 1985, 1986, 1987, 1988 and 1989) post-intervention. Family functioning was measured using the General Functioning Subscale of the Family Assessment Device.¹¹ Scores on the subscale vary from 12-48 with higher scores signifying more family dysfunction. The Nowicki-Strickland Locus of Control scale was used to measure locus of control.¹² Scores on this scale range from 0-40, with higher scores indicating more responsiveness to external pressure. Student age, gender and parental composition in the home were obtained from board of education registers.

Data about sexual activity and birth control use were collected using a private ballot. The questions progressed from least sensitive to most sensitive. Each question was hidden in a perforated pocket that was opened only if the adolescent responded affirmatively to the previous question. The ballot was completed behind a polling booth, placed in an envelope, sealed and deposited into a ballot box.

Since there were no statistically significant differences between the experimental and control groups on any of the variables, for these analyses, the data were combined.

Using the entire sample over the six data collection points, rates of sexual intercourse by age and gender were calculated. The time between data collection at pretest and at the first post-test was less than one year. To avoid double counting of any of

the subjects, data from those who were the same age at both tests were examined and only one test result was included. If they reported sexual intercourse at either time, that result was included. To determine age at first intercourse, only those who reported no sexual intercourse at pretest or for all the previous years were included. A 'core developmental' sample as described by Jessor,¹³ was used to determine sexual activity over three years. This group included those who had not reported sexual intercourse at or before ages 11, 12, and 13 years and for whom sexual activity data were available for all three subsequent years. From reporting no sexual intercourse at the youngest age, the data over the subsequent three years were divided into three outcomes: no intercourse for each of the three years; sexual intercourse in some years, but not others; and, sexual intercourse reported in all three of the years. The number and proportion of students falling into each category for each of the three years were calculated to determine the progression of sexual activity.

To determine the factors that predict early sexual activity, two multiple logistic regressions (one for each gender) were completed using measures of the predictors that were available. Early sexual activity was defined as having reported first sexual intercourse at 14 years of age or younger. Because sexual intercourse rates were school dependent, school was forced into the regression. The other variables (family functioning, maternal and paternal education, family constellation, family ethnicity, and adolescent locus of control) were entered in step-wise fashion. All analyses were carried out using SAS.¹⁴

RESULTS

The baseline characteristics of the sample are outlined in Table I.

The prevalence of sexual activity by age and gender is outlined in Table II. Rates increased for both genders as age increased. At ages younger than 16 years, males consistently reported statistically significantly higher rates of sexual intercourse than females. Among the very young (11-13 years old), males reported sexual intercourse almost twice as often as females. By

TABLE I
Age and Gender
Distribution at Baseline

Age	Male n	(%)	Female n	(%)
10	11	(0.1)	4	(0.2)
11	86	(5.5)	130	(7.7)
12	561	(35.7)	706	(41.7)
13	674	(42.9)	676	(40.0)
14	208	(13.2)	148	(8.7)
15	38	(2.4)	26	(1.5)
16	2	(0.1)	2	(0.1)
TOTAL	1580	(100%)	1692	(100%)

TABLE II
Prevalence of Sexual Intercourse
by Age and Gender

Age	Male n	(%)	Female n	(%)
11	14	(7.5)	8	(6.0)
12	171	(26.3)	108	(12.9)†
13	410	(30.8)	279	(18.4)†
14	594	(39.7)	475	(29.3)†
15	656	(44.9)	611	(38.5)†
16	627	(50.3)	662	(49.7)
17	451	(58.7)	449	(57.1)

* students reporting sexual intercourse
total number of students at that age during the study X 100
† p ≤ 0.001

TABLE III
Incidence of First Sexual Intercourse
by Age and Gender

Age	Male n	(%)	Female n	(%)
12	61	(11.6)	37	(4.9)†
13	135	(13.9)	134	(10.3)†
14	205	(22.2)	241	(19.4)
15	175	(24.0)	27	(21.1)
16	124	(24.8)	170	(24.8)
17	59	(25.5)	81	(25.5)

* number of students reporting first sexual intercourse
total number of students at that age during the study X 100
† p ≤ 0.001

ages 16 and 17 years, rates of sexual intercourse among males and females were similar. By age 16 years, 50.3% of males and 49.7% of females reported having engaged in sexual intercourse.

The incidence of first sexual activity by age and gender is found in Table III. At age 12 years, males reported first sexual intercourse more than twice as frequently as females. At ages 14 and 15 years, although first intercourse was reported more frequently by males, there was no statistically significant difference found

TABLE IV
Progression of Sexual Activity by Gender
Males (n = 888) Females (n = 1,173)

Age	Sexual Activity					
	Always n (%)	Intermittent n (%)	Never n (%)	Always n (%)	Intermittent n (%)	Never n (%)
11-14						
Male	4 (6.3)	26 (40.6)	34 (53.1)			
Female	3 (2.8)	26 (23.9)	80 (73.3)			
12-15						
Male	36 (9.1)	167 (41.9)	195 (49.0)			
Female	32 (5.5)	229 (39.6)	318 (54.9)			
13-16						
Male	71 (16.7)	172 (40.4)	183 (42.9)			
Female	72 (14.9)	190 (39.2)	223 (45.9)			

between the two genders. By ages 16 and 17 years, the rates of first intercourse were the same for both genders.

Table IV summarizes the progression of sexual intercourse among young adolescent males and females. The "core" sample included 888 males and 1,173 females. This represents 56% of males and 69% of females in the MTP. The rate of reporting sexual intercourse in each of the three years increased as the age of beginning sexual intercourse increased. Among the two younger cohorts, the overall proportion reporting sexual intercourse in each of the three years is low, with males (6% and 9% respectively) falling into this category twice as frequently as females (3% and 6% respectively). However, among those followed from 13 to 16 years (the oldest cohort), 17% of males and 15% of females reported being sexually active at all three points in time. For every age group, over 80% of both males and females reported either intermittent sexual intercourse or no sexual intercourse over the three years.

The results of the multiple logistic regression for males and females are outlined in Table V. After adjusting for school, different factors predicted no sexual intercourse among males and females aged 14 years or younger. For males, the two factors were lower (indicating normal functioning) family functioning scores and having both parents in the home. For females, there were four predictive factors: more maternal education (college or university versus elementary school); both parents in the home; lower locus of control scores (i.e., more internally controlled); and, a language other than English spoken in the home.

DISCUSSION

The data used in these analyses have two unique features: the very large sample size, and the fact that they are prospective over 5.5 years. The city in which they were collected is similar to other Canadian cities, in that it is a large industrial centre with a multi-ethnic, predominantly white population. Based on these data, several recommendations for future programs can be made.

The relatively high rates of sexual intercourse reported by those 13 years of age and younger are troublesome. One issue that we could not clarify is what proportion of these encounters were consensual. If sexual abuse is a partial explanation, it is potentially much more frequent among males than previously thought. This is an important area for future study both because of the burden of suffering for these youth, as well as the implications for intervention/treatment.

The fact that the rates of sexual intercourse for young males are twice those for young females is perplexing. This has been reported by others, but no satisfactory explanation has emerged. One issue may be the bias in self-reported data, in that males may exaggerate their sexual experience as part of creating a "macho" image. Newcomer and Udry¹⁵ found that male respondents tend to over-report and females to under-report when providing information regarding their sexual behaviour.

When compared to the American sample of 15-19 year olds described by Kann et al.,⁴ the sexual intercourse rates among this Ontario sample were higher for 15 and 16 year olds, and lower for 17 and 18 year

TABLE V
Odds Ratios of Stepwise Logistic Regression of Factors Against No Sexual Activity by Age 14 Years by Gender Controlling for School

Factors	Odds Ratio*	
	Males	Females
Normal family functioning	0.97	—
Both parents in the home	1.40	1.70
More maternal education	—	1.77
Internal locus of control	—	0.96
Ethnicity	—	1.47

* $p \leq 0.01$

olds. The rates for males at all ages were higher than those reported by Sonenstein et al.¹⁶ for white males. In spite of this, large numbers of adolescents (over 40%) 17 years of age or younger are not sexually active. Programs designed for broad-based groups must be relevant and reinforcing for this large subgroup.

Although incidence of first sexual intercourse increases with age among this population, the largest annual increase for both genders occurs between ages 13 and 14 years. Data from the progression of sexual intercourse also support this time for intervention in that annual reports of activity are very low among those aged 11 to 14 years. Since 40% of those who are not sexually active at ages 12 and 13 years (and older) report intermittent sexual intercourse over the subsequent three years, programs aimed at this age group might effectively reduce the frequency of sexual intercourse. Such programs should include successful strategies for both sexually experienced and inexperienced adolescents.

With fewer resources available, researchers are beginning to consider the role of universal programs, targeted programs for those at high risk, and a combination of the two types of programs. Our findings regarding the protective explanatory factors associated with no sexual intercourse by 14 years of age may be useful in identifying those who might qualify for universal versus targeted interventions. The identification of strategies for implementing targeted interventions without labelling students will be an important challenge.

These analyses provide empirical data from an Ontario perspective, and additional insights into targeting programs to reduce adolescent sexual activity.

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