ABSTRACT

Objectives and Methods: Data from the Ontario Health Survey were used to identify sociodemographic, lifestyle and sexual history characteristics associated with the use of condoms for protection against sexually transmitted diseases (STDs) in randomly selected adults between the ages of 16 and 44 years who had had two or more sexual partners in the 12 months before the survey (n = 2,699).

Results: Forty-two percent reported not having used condoms for protection against STDs. Those most likely to use condoms were 16 to 24 years of age, males, students, non-binge-drinkers, urban residents, and those at higher risk for HIV/AIDS. Of those who used condoms, 68% did not use them consistently. Individuals most likely to always use condoms were 16 to 24 years of age, males, students, non-binge-drinkers, and those with secondary school education. Age, gender, occupational activity, and non-binge-drinking were common correlates of both condom use and consistent use.

Conclusions: Public health messages should be focused on people with multiple sex partners who are not using condoms for STD protection, including rural residents, those with high levels of education, and those over 34 years of age.

ABRÉGÉ

Objectifs et méthodes : on s'est servi des données provenant de l'Enquête sur la santé en Ontario pour identifier les caractéristiques sociodémographiques, de mode de vie et des antécédents sexuels associées à l'utilisation de condoms pour se protéger contre les maladies transmises sexuellement (MTS) chez des adultes choisis de façon aléatoire, âgés de 16 à 44 ans, qui avaient eu deux partenaires sexuels ou plus au cours des 12 mois précédant l'enquête (n = 2 699).

Résultats : Quarante deux pour cent des individus sondés ont déclaré ne s'être jamais servis d'un condom pour se protéger contre les MTS. Ceux présentant la plus grande probabilité d'utiliser un condom étaient des hommes âgés de 16 à 24 ans, étudiants, sans habitude de beuveries, résidant en milieu urbain et à risque plus élevé d'infection par le VIH/sida. Parmi les utilisateurs de condoms, 68 % ne les utilisaient pas de façon systématique. Les individus qui avaient le plus de probabilité de toujours utiliser un condom étaient des hommes âgés de 16 à 24 ans, étudiants, sans habitude de beuveries et ayant fait des études secondaires. L'âge, le genre, l'activité professionnelle et les beuveries sont apparus comme des corrélats communs tant à l'utilisation de condoms qu'à leur utilisation systématique.

Conclusions : Les messages de la santé publique doivent être dirigés sur les personnes ayant des partenaires multiples qui n'utilisent pas de condoms pour se protéger contre les MTS, notamment celles vivant en milieu rural, celles qui ont un haut niveau d'études et celles qui ont plus de 34 ans.

Correlates of Condom Use in the Young Adult Population in Ontario

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The human immunodeficiency virus (HIV) is known to cause both chronic infection and death. In the absence of a vaccine or cure, preventive measures are the only effective means of reducing viral spread.¹ Condom use is the recommended method of protection against HIV and other sexually transmitted diseases (STDs) for those who have sexual intercourse with serial or concurrent multiple partners.² Little is known about the prevalence and correlates of condom use in Ontario's population and in particular among those with multiple partners, who are considered to be at higher risk for the transmission of STDs. Although the amount of research on condom use has increased with the introduction of HIV, most has focused on specific populations and used nonprobability sampling methods.³⁻¹⁵ Hence, these studies have limited generalizability. The correlates and predictors of condom use identified in the literature include basic sociodemographic descriptors and the results of the testing of theory-based behavioural models.

The objectives of this study were to use the data from a probability sample of

Ontario residents to 1) examine the prevalence and consistency of condom use for STD protection among young adults who had two or more sexual partners over a 12-month period; and 2) identify some of the sociodemographic, sexual history, and lifestyle factors correlated with condom use among this population.

METHODS

The reported results are from a secondary analysis of the 1990 Ontario Health Survey (OHS),^{16,17} a survey of all Ontario residents living in private dwellings. This was the first Ontario general purpose health survey to include questions on sexual behaviour, and it offers a unique opportunity to examine factors that affect condom use in the population at large. To ensure representativeness, the OHS used a random multistage stratified cluster sample. The survey consisted of an interviewer-completed component that provided information on all household members, and a self-administered component completed by each household member. Details on the methodology of the survey are described elsewhere.¹⁷

A total of 61,239 individuals participated in the OHS survey. The overall response rate was 88% for the interviewer-completed portion and 77% for the self-completed portion. The lowest response rate was in Metropolitan Toronto. Among those with two or more sexual partners (the focus of this analysis), the rate of non-response for the question on condom use was 2% among 16-44 year olds and 7% among those over the age of 44. Those over 44 had higher nonresponse rates for all sexual health questions and were excluded from the present analysis, as were

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those under 16 years of age, since they were not asked to complete the sexual health section. There were 26,121 individuals between the ages of 16 and 44 in the sample. Of these, 15% (n = 4,011) reported no sexual partners in the 12 months before the survey, 62% (n = 16,297) reported one partner, 10% (n = 2,699) reported two or more, and 12% (n = 3,114) did not answer the question. Because of our interest in condom use among those most at risk, the reported analysis is based on 2,699 respondents between 16 and 44 years of age who had had sexual intercourse with two or more partners in the 12 months before the survey. Those with two or more consecutive or simultaneous partners are seen to be at higher risk of STD/HIV infection than those with one sexual partner.

Condom use in the OHS was measured in two ways. One question asked about the use of condoms as a method of birth control and the other as protection against STDs. Since the focus of this study is to understand the factors associated with condom use for protection against STDs, only those who said they used them for STD protection were classified as users. Only 12% of condom users made use of them specifically for birth control. The question used to measure condom use was, "In the past year, how often did you or your partner(s) use a condom as protection from sexually transmitted diseases?". Possible responses were "never", "on at least one occasion", "a few times", "often", and "always". For our purposes condom use was categorized in two ways. Individuals who reported not having used a condom in the previous 12 months were classified as nonusers, and those who had used them "at least once", "a few times", "often" or "always" were classified as users. Condom users were further categorized as consistent users if they always used condoms, and inconsistent if they did not always use them. The categorization of condom use is similar to that used in other condom research.¹⁵

The independent variables included in the analysis were limited to those measured by the OHS but are similar to the descriptive variables identified through the literature review as factors associated with con-

dom use.¹⁴ These included 1) sociodemographic variables such as age, gender, marital status, urban/rural residence, level of education, main occupational activity, occupation, and household income; 2) age at first sexual intercourse (median age of first sexual intercourse); and 3) lifestyle variables such as binge-drinking (defined by OHS as those who have had 10 or more standard drinks on one occasion), use of other birth control methods, and risk factors for HIV/AIDS (defined in the OHS as anyone who was a haemophiliac, had engaged in homosexual activity, had received clotting factor concentrates since 1978, had injected recreational drugs, or had had sex in return for money or drugs since 1978).

Descriptive statistics and logistic regression analyses were performed using SPSS/PC+ version 5.0.^{18,19} Since many of the variables were interrelated, a forward stepwise logistic regression analysis was performed to assess the joint relationships to condom use. All analyses were weighted to represent the probability that a particular individual was sampled. The weights were adjusted, so that the sum of all the weights equalled the total sample size, using a well-established method.²⁰ By using this method, adjustments for unequal probabilities of selection and nonresponse were made to reflect the population estimate.

RESULTS

Seventy-three percent (n=18,996) of the respondents aged 16 to 44 years reported having had at least one sexual partner in the 12 months preceding the interview, and 77% of them had not used a condom for STD protection. The majority (84%) of those who were sexually active reported having one partner, and 14% reported two or more partners. Males were more likely than females to have two or more partners (18% versus 10%).

The remaining results are based exclusively on individuals between the ages of 16 and 44 years who had two or more sexual partners (n = 2,699). Among this subsample the median age of first sexual intercourse was 16 years. Individuals who were 16 to 24 years of age at the time of the

study reported having had their first sexual intercourse at a younger age than did those aged 35 to 44. Nine percent reported "yes" to at least one of the five HIV/AIDS risk factors, 5% did not know whether they were at risk, and 82% said "no". Those at higher risk for HIV infection were concentrated among males in the 35-44 year group. Forty-two percent of the subsample (95% C.I.: 39%-45%) reported not having used condoms for STD protection in the 12 months before the survey; only 18% (95% C.I.: 16%-20%) reported consistent condom use. Of the 58% who had used condoms, 68% (95% C.I.: 64%-72%) used them inconsistently, and 32% (95% C.I.: 28%-36%) always used them.

Correlates with having ever used condoms

Results of univariate logistic analysis

Table I indicates the variables that were correlated with ever having used condoms in the 12 months before the study among those with two or more sexual partners. The sociodemographic variables significantly associated with condom use in the univariate analysis included gender, age group, marital status, occupational activity, and occupational level. Those who reported having used condoms were more likely to be males, in the age groups 16-24 or 25-34, single, students, and in unskilled occupations. Level of education, age at first sexual intercourse, household income, and urban-rural residence were not statistically associated with condom use in the univariate analysis.

Among the lifestyle variables, being at higher risk of HIV/AIDS was significantly associated with condom use. There were no significant differences in condom use for those with or without a history of binge-drinking. Use of other methods of birth control was not associated with condom use. (When specific types of birth control were examined individually, no relationship was found between use of the birth control pill or intrauterine device and condom use for STD protection, but those who reported having had a vasectomy or tubal ligation were less likely to report condom use, and those who used diaphragms were more likely to report condom use for STD prevention.)

TABLE I
Correlates of Ever Having Used Condoms for STD Protection in Previous 12 Months Among Those with Two or More Partners - Results of Univariate and Multivariate Logistic Analyses

Variable	N	% (95% C.I.)	Crude Value		Adjusted Value	
			Odds Ratio	p-value	Odds Ratio (95% C.I.)	p-value
Gender						
Male	1,458	63% (0.59; 0.67)	Ref		Ref	
Female	859	49% (0.44; 0.54)	0.56	0.00	0.48 (0.39;0.59)	0.00
Age Group						
16 - 24 years	1,190	67% (0.63; 0.71)	Ref		Ref	
25 - 34 years	722	48% (0.42; 0.54)	0.44	0.00	0.50 (0.40;0.64)	0.00
35 - 44 years	405	50% (0.42; 0.58)	0.48	0.00	0.58 (0.43;0.78)	0.00
Marital Status						
Married	354	40% (0.32; 0.48)	Ref		Ref	
Single	1,661	64% (0.60; 0.68)	2.65	0.00	-	0.24
Level of Education						
Primary/secondary	1,262	59% (0.55; 0.63)	Ref		Ref	
Post-secondary	1,049	58% (0.53; 0.63)	0.96	0.65	-	0.32
Main Activity						
Going to school	681	71% (0.66;0.76)	Ref		Ref	
Working	1,461	53% (0.49; 0.57)	0.46	0.00	0.57 (0.45;0.74)	0.00
Occupation						
Unskilled	459	63% (0.56; 0.70)	Ref		Ref	
Skilled	1,094	59% (0.54; 0.64)	0.83	0.11	-	0.79
Professional	491	51% (0.44; 0.58)	0.62	0.00	-	0.93
Household Income						
Less than \$12,000	308	56% (0.47;0.65)	Ref		Ref	
\$12,000 - \$49,000	737	55% (0.49; 0.61)	0.93	0.60	-	0.09
\$50,000 or more	976	62% (0.57; 0.67)	1.26	0.08	-	0.32
Urban/Rural Residence						
Urban	2,084	59% (0.56; 0.62)	Ref		Ref	
Rural	232	53% (0.43; 0.63)	0.80	0.11	0.67 (0.50;0.92)	0.01
Age at First Sexual Intercourse						
16 years or less	1,301	59% (0.56; 0.62)	Ref		Ref	
17 years or more	978	57% (0.51; 0.63)	0.90	0.23	-	0.21
Binge-drinkers						
No	791	59% (0.54; 0.64)	Ref		Ref	
Yes	1,316	58% (0.54; 0.62)	0.95	0.60	0.73 (0.59; 0.90)	0.00
Higher Risk for HIV/AIDS						
Yes	220	70% (0.60; 0.80)	Ref		Ref	
No	1,920	58% (0.55; 0.61)	0.60	0.00	0.60 (0.43; 0.85)	0.00
Other Forms of Birth Control*						
Yes	1,584	56% (0.52; 0.60)	Ref		Ref	
No	660	68% (0.62; 0.74)	1.31	0.85	-	0.31

* The analysis was done after collapsing other forms of birth control besides condoms (including contraceptive pill, diaphragm, vasectomy or tubal ligation).

Results of multivariate logistic analysis

All of the independent variables included in the univariate analysis were entered into a stepwise logistic regression. In the multiple logistic regression model of ever having used condoms in the previous 12 months, the variables gender, age, main activity (school or work), and risk for HIV/AIDS were significantly associated with condom use (see Table I). Females were 52% less likely to use con-

doms than males. Those in the age groups 25-34 and 35-44 were 50% less likely to report ever using condoms than those in the 16-24 age group. Those who were working were 43% less likely to use condoms than those attending school. Those who were at lower risk of exposure to HIV/AIDS were 40% less likely to use condoms.

Two variables, urban-rural residence and binge drinking, that were not statistically

significant in the univariate analysis were significant in the multivariate analysis. Individuals living in rural areas were 33% less likely to report using condoms than those who lived in urban areas. Also, binge-drinkers were 27% less likely to use condoms. A number of variables, including marital status, occupational level, and use of other forms of birth control (besides condoms), were not significant in this model.

TABLE II
Correlates of Consistency of Condom Use Among Users of Condoms for STD Protection in Previous 12 Months Among Those with Two or More Partners - Results of Univariate and Multivariate Logistic Analyses

Variable	N	% (95% C.I.)	Crude Value		Adjusted Value	
			Odds Ratio	p-value	Odds Ratio (95% C.I.)	p-value
Gender						
Male	1,458	23% (0.20; 0.26)	Ref		Ref	
Female	859	11% (0.08; 0.14)	0.42	0.00	0.35 (0.27; 0.46)	0.00
Age-Group						
16 - 24 years	1,190	24% (0.20; 0.28)	Ref			
25 - 34 years	722	13% (0.09; 0.17)	0.47	0.00	0.73 (0.53; 1.00)	0.05
35 - 44 years	405	12% (0.07; 0.17)	0.44	0.00	0.63 (0.41; 0.95)	0.03
Marital Status						
Married	354	10% (0.05; 0.15)	Ref		Ref	
Single	1,661	22% (0.19; 0.25)	2.44	0.00	-	0.12
Level of Education						
Primary/secondary	1,262	22% (0.18; 0.26)	Ref		Ref	
Post-secondary	1,049	15% (0.12; 0.18)	0.63	0.00	0.70 (0.55; 0.90)	0.01
Main Activity						
Going to school	681	29% (0.24; 0.34)	Ref		Ref	
Working	1,461	14% (0.11; 0.17)	0.40	0.00	0.48 (0.36; 0.64)	0.00
Occupation						
Unskilled	459	22% (0.15; 0.29)	Ref		Ref	
Skilled	1,094	17% (0.13; 0.21)	0.71	0.02	-	0.80
Professional	491	15% (0.11; 0.19)	0.64	0.01	-	0.18
Household Income						
Less than \$12,000	308	13% (0.07; 0.19)	Ref		Ref	
\$12,000 - \$49,000	737	18% (0.14; 0.22)	1.48	0.05	-	0.50
\$50,000 or more	976	20% (0.16; 0.24)	1.79	0.00	-	0.05
Urban/Rural Residence						
Urban	2,084	19% (0.16; 0.22)	Ref		Ref	
Rural	232	17% (0.09; 0.25)	0.86	0.43	-	0.14
Age at First Sexual Intercourse						
16 years or less	1,301	20% (0.19; 0.21)	Ref		Ref	
17 years or more	978	16% (0.14; 0.18)	0.75	0.01	-	0.27
Binge-drinkers						
No	791	20% (0.16; 0.24)	Ref		Ref	
Yes	1,316	17% (0.14; 0.20)	0.80	0.05	0.55 (0.42; 0.72)	0.00
Higher Risk for HIV/AIDS						
Yes	220	22% (0.13; 0.31)	Ref		Ref	
No	1,920	18% (0.15; 0.21)	0.79	0.18	-	0.44
Other Forms of Birth Control*						
Yes	1,584	12% (0.10; 0.14)	Ref		Ref	
No	660	34% (0.28; 0.40)	1.27	0.90	-	0.80

* The analysis was done after collapsing other forms of birth control besides condoms (including contraceptive pill, diaphragm, vasectomy or tubal ligation).

Correlates of consistent condom use

Results of univariate analysis

Table II shows the correlates with consistent condom use among condom users with two or more partners in the previous 12 months. The sociodemographic variables correlated with consistent condom use included gender, age, marital status, level of education, main activity, occupational level and income. Those most likely to always use condoms were males, 16-24 years of age, single, with primary or secondary level

of education, students, those in unskilled or skilled occupations and those with higher income. Individuals who had their first sexual intercourse when they were 16 years of age or less were more likely to always use condoms. Consistency of condom use was not associated with other forms of birth control, binge-drinking, being at higher risk of HIV, or urban-rural residence.

Results of multivariate analysis

The variables that were statistically significant in the multivariate model of con-

sistent versus inconsistent condom use were gender, age, level of education, main activity, and history of binge-drinking (see Table II). Females were 65% less likely to consistently use condoms. Those in the 35-44 age group were 37% less likely to always use condoms than those in the 16-24 age group. No significant difference was observed between the 25-34 age group and the 16-24 age group. Those with post-secondary education were 30% less likely than those with only primary or secondary education to consistently use condoms.

Employed individuals were 52% less likely than students to report using condoms consistently. Binge-drinkers were 45% less likely to report using condoms consistently than those who were not. Marital status, urban-rural residency, age at first sexual intercourse, risk for HIV/AIDS, and forms of birth control were not significantly associated with consistency of condom use.

The multivariate analyses indicate that many of the variables associated with having ever used a condom in the previous year were also associated with the consistency of use among users. Gender, age, main activity, and history of non-binge drinking were associated with both use and consistency of use. Urban-rural residency and being at higher risk for HIV/AIDS were correlated with condom use in the previous year but not with the consistency of condom use among users. Level of education was associated with consistency of use but not with condoms having ever been used. Marital status, occupational level, income, age at first sexual intercourse, and forms of birth control (other than condoms) were not associated with either use or consistency of use among users.

DISCUSSION

This is the first study to examine the prevalence of condom use for STD/HIV protection among a randomly selected sample of Ontario adults. The results indicate that a significant number (10%) of sexually active 16 to 44 year olds in Ontario had two or more sexual partners over a 12-month period, that 42% had not used a condom, 39% had inconsistently used condoms, and 18% had consistently used a condom for protection against STDs. Although these figures underestimate overall condom use in Ontario, as they do not include those who indirectly protect themselves from STDs when they use condoms for birth control, the goal of the analysis was to provide baseline information from which public health officials may set targets and assess their efforts in encouraging the use of condoms for STD protection for those with multiple partners.

A direct comparison with rates of condom use reported in other Canadian stud-

ies is difficult, given the difference in the populations studied, the time period for which condom use was measured, and whether it was measured in the context of birth control, STD protection, or in general. There are several comparisons that may be made with published Canadian studies. In a study of 13-19 year old high school students in Nova Scotia²¹ it was reported that 18% had never used condoms, 47% inconsistently used them, and 35% always used them. A national study of college and university students²² reported that 24% of males never used condoms, 51% used them inconsistently, and 25% always used them. Of the females, 30% never used them, 54% used them inconsistently, and 16% always used them. A study of street youth (15-20 years of age) in 10 Canadian urban centres reported that 27% of males and 25% of females always used condoms.²³ An early study that most closely resembles the random sampling design of this study reported condom use by Canadian adults (18 years and over) with two or more sexual partners over a five-year period. Ornstein²⁴ reported that 44% of the males had not used condoms, 37% had used them inconsistently, and 19% always used them. Among the females 62% had never used them, 26% used them inconsistently, and 12% always used them.

The variables associated with condom use in our multivariate analysis were consistent with those identified in other studies conducted in Canada and elsewhere. These included gender,^{23,25,26} age,^{23,25,27-30} urban/rural residence,³⁰ level of education,⁴ main occupational activity, binge-drinking,³¹ and known HIV risk.^{7,14,21,25} The fact that students were more likely to report condom use and consistent use than those whose main activity was work (even after age was controlled for) may indicate that school-based prevention programs are having some degree of success.

A comparison of the two multivariate models ("ever versus never use" and "consistent versus inconsistent use") provides a better understanding of the factors that influence the two processes. Many of the variables were found to be significant in both models. Males, those of younger age, students, and those without a history of

binge-drinking were more likely to have used a condom and once they used them were more likely to consistently use them. On the other hand, those who lived in a rural area were less likely to have ever used a condom, but once they had used them were just as likely as urban residents to use them consistently. This may indicate that rural residents have less anonymous access to condoms, or may perceive themselves to be at lower risk because they live in a rural community; but once they use condoms, they use them as consistently as urban residents. Those at higher risk for HIV infection were more likely to report having used a condom but not more likely to consistently use them. Level of education was not a significant predictor of ever having used a condom in the multivariate analysis but was a significant predictor of consistency of use among users. Those who had a primary or secondary level education tended to use condoms more consistently than those with postsecondary education.

The level of the STD/HIV risk experienced by those who inconsistently used condoms is difficult to assess because the OHS did not collect information on the sexual history of individuals and all their partners, their STD/HIV histories, or the reasons for inconsistent use. Therefore, the extent to which inconsistent condom use reflects a person's accurate perception of risk or the ineffectiveness of existing condom promotion campaigns cannot be determined.

The results of this secondary analysis of the Ontario Health Survey suggest that while public health messages about condom use appear to be reaching a majority of young people and specifically young males, more attention should be focused on populations with serial or simultaneous multiple partners who are not at present using condoms or are using them inconsistently, especially females, those in rural areas, those who have high levels of education, and those over 35 years of age.

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