Prevalence and Predictors of Condom Use among a National Sample of Canadian University Students

Abstract

Young adult Canadians of university age are highly sexually active compared to other age groups and are at relatively high risk for sexually transmitted infection (STI). It is therefore important to comprehensively assess condom use in this age group. In this study, the prevalence and individual predictors of condom use at last penile vaginal intercourse (PVI) were assessed among a national sample of 653 Canadian university students (252 male, 401 female). Overall, less than half (47.2%) of the students reported condom use at last PVI. Condom use was higher among men (55.4%) than women (42.3%). For both men and women, the most frequently cited main reason for having used a condom was birth control. In multivariate analyses, the strongest predictor of condom use at last PVI was a preference for condoms as a contraceptive method; specifically, men and women who stated condoms were their preferred method were 9 and 23 times, respectively, more likely to use condoms at last PVI than those who selected another method. Female students who reported that their most recent sexual encounter occurred with a more committed partner (e.g., committed dating versus a hook-up) had slightly lower odds of reporting condom use at last PVI. The results indicate that rates of condom use are low among Canadian university students and that many students are likely at high risk for STI. Interventions to raise awareness of STIs are needed on Canadian university campuses and educational programs should emphasize improving attitudes towards condoms in addition to developing sexual health knowledge and condom use skills.

Keywords: sexual health, condom use, behaviours, university students, contraception

The prevalence and predictors of condom use among university students and similarly aged young adults is of interest to educators, public health policy makers, and researchers for a number of reasons. First, young adults of university age (approximately 18 to 24) are a highly sexually active cohort. Data from the *Canadian Community Health Survey* indicate that 91.9% of unmarried, not living common-law 20 to 24 year-olds reported having sexual intercourse in the previous 12 months and, among those who were sexually active, 36.9% reported more than one sexual partner in the same time period (Rotermann & McKay, 2009). Second, the prevalence of sexually transmitted infection (STI) is high among young adults in Canada. Reported rates of chlamydia and gonorrhea are highest in the 20 to 24 age group (Public Health Agency of Canada, 2010). Although definitive age-specific prevalence data for chlamydia among Canadians is not available, surveillance data from the United States indicates a positivity rate of 8.4% among women aged 15 to 24 attending family planning clinics (Centers for Disease Control and Prevention [CDC], 2013a) and of 9.7% among a sample of college students (James, Simpson, & Chamberlain, 2008). The prevalence of human papillommavirus (HPV) among US women aged 20 to 24 is estimated to be 45% (Dunne, et al., 2007) and a study of students at a Canadian university found a prevalence of over 50% among both sexes (Burchell, Tellier, Hanely, Coutlée, & Franco, 2010). Data from the *Canadian Health Measures Survey* indicate that approximately 6% of people aged 14 to 34 have acquired genital herpes (HSV-2) (Rotermann, Langlois, Severini, & Totten, 2013) and it is likely that a significant proportion of these infections were acquired during young adulthood.

Correct and consistent condom use reduces the risk of acquisition and transmission of STI. Laboratory studies have demonstrated that latex condoms provide an essentially impermeable barrier to particles the size of STI pathogens and epidemiological studies have found that consistent condom use reduces the risk of STIs including HIV, Chlamydia, and Gonorrhea (CDC, 2013b, Crosby & Bounce, 2012, McKay, 2007). While condoms cannot protect against transmission of STI such as HPV and HSV-2 to and from genital areas not covered by a condom, studies have indicated that consistent condom use reduces the risk of infection for HPV (Hariri & Warner, 2013; Winer et al., 2006) and HSV-2 (Martin, et al., 2009; Wald, et al., 2005). It is therefore important to measure and assess the use of condoms among sexually active young adult Canadians.

Several studies have measured condom use among national samples of young adult Canadians (e.g., Black et al., 2009; Fisher, Boroditsky, & Morris, 2004; Macdonald et al., 1990; Rotermann & McKay, 2009). With the exception of Rotermann and McKay, the above noted studies also measured the use of other contraceptive methods. Condom use can be influenced by decisions to use other types of birth control – specifically, couples often shift from condom use to hormonal methods as relationships progress (Kusunoki & Upchurch, 2011) – thus it is important to assess condom use alongside other contraceptive methods when examining predictors of condom use among samples of heterosexually active people (Noar, Cole, & Carlyle, 2006). These studies used a variety of methods to measure condom use. Black et al. measured condom use by asking female respondents who had had vaginal intercourse in the previous six months to indicate which contraceptive methods they were currently using. Similarly, Fisher et al., asked women who had ever had intercourse what methods of contraception they were currently using. Macdonald et al. assessed frequency of condom use (never, sometimes, always) among college students . Rottermann and McKay utilized data from the *Canadian Community Health Survey* to report on condom use at last intercourse among 20- to 34-year-old unmarried, not living common-law males and females who had had intercourse in the previous 12 months.

The current study employed an event-level methodology (method of contraception used at last penile-vaginal intercourse [PVI] among respondents who had PVI during their most recent sexual encounter) with a 3-month maximum recall period in order to maximize the precision of condom use measurement. Recall of condom use has been found to be relatively stable up to a three-month recall period, with longer recall periods increasing the likelihood of inaccurate reporting due to recall error and biases (Graham, Catania, Brand, Duong, & Canchola, 2003). Thus, compared to previous large surveys of young adult Canadians which have used statements of current method use or general frequency estimates of condom use and/or longer recall periods, the current study utilized a more precise measurement of recent condom use with a high degree of specificity (Noar, Cole & Carlyle, 2006). In the current study, our data show a high correlation (.80) between condom use last sex and condom use frequency (never to always). Previous research has also indicated that condom use at last intercourse is a valid proxy for condom use over longer time periods (Younge et al., 2008).

Previous research has yielded varying estimates of the prevalence of condom use among young adult Canadians. With respect to contraceptive use, Canadian research has consistently

found that condoms and oral contraceptives (OC) are the most frequently used methods. Black et al. (2009) found that among 20 to 29 year-old women, 58.3% indicated OCs and 55.5% indicated condoms as their current method. For unmarried women aged 18-34 sampled in the *Canadian Contraception Study*, 56% reported currently using OCs and 35% reported using condoms (Fisher et al., 2004). In their study of sexually active Canadian college and university students, Macdonald et al. (1990) found that 41.9% of males and 25% of females reported that they "often" or "always" used condoms. Rotermann and McKay (2009) found that 63.7% of male and 53.8% of female sexually active, unmarried/not living common law 20-24 year-old Canadians reported using a condom at last intercourse. The primary objective of the current study was to provide an up-to-date, precise measurement of the prevalence of condom use at last PVI among Canadian university students.

A wide array of variables have been examined as potential predictors of condom use among adolescents and young adults including individual differences, relational contexts, and situational factors (for review, see Sprecher, 2013). The *Trojan/SIECCAN Sexual Health Study*, from which the data for the current investigation was drawn, collected data on a wide range of variables related to the sexual health of Canadian university students. Accordingly, a secondary objective of this study was to identify individual-level predictors of condom use at last PVI. Among the available variables, concern about STI, concern about unplanned pregnancy, perceived access to condoms, personal preference for condoms as a contraceptive method, and sexual health knowledge were selected as potential predictors. Bivariate and multivariate associations were examined.

Method

Participants

Participants were 1,500 Canadian university students between the ages of 18 and 24. For the purposes of the current investigation, some participants were excluded from the analysis. Those who indicated they had never had a sexual partner (n = 372) were excluded. Individuals who had not been sexually active over the previous 3 months (n = 195) and 115 people who chose not to answer the question about when their last sexual encounter occurred were also excluded. Because the key variable of interest in the analysis was condom use at last PVI, the sample was further reduced by 164 people who did not indicate their last sexual encounter included PVI. Given analyses were conducted by gender, one person who identified as

transgender was excluded. Thus, participants in the current analysis were individuals who identified as a man or woman, and who reported having had PVI over the past three months, whose last sexual encounter included PVI.

The analytic sample was comprised of 653 participants (252 male, 401 female) with a mean age of 21.11 (SD = 1.75). The majority (89%) were born in Canada. Eighty percent were approximately equally distributed across first through third year of their degree programs; the remainder were in their fourth or fifth year. Participants were from Ontario (41.2%), Quebec (25.6%), the Prairie provinces (15.2%), British Columbia (9.8%), and the Atlantic provinces (8.1%).

Procedure

The study was designed by the second author in partnership with the Trojan Sexual Health Division of Church & Dwight Canada to better understand the sexual health needs of young adult Canadians. Data were collected between December 6, 2012 and January 2, 2013, by Leger Marketing, a professional marketing company, in partnership with Uthink Online, a market research organization that specializes in students and youth. Participants were Leger and Uthink research panellists. The Leger panel was created using a random telephone recruiting method and is comprised of approximately 460,000 members representative of the Canadian population. For the current study the Leger panel was supplemented by the Uthink Online panel to ensure that an adequate sample of regionally diverse Canadian university students was obtained.

Eligible panellists were invited to participate via an email from Leger Marketing and a single email reminder was sent to those who did not respond to the initial message. The participant clicked on a link which led to the study portal in order to complete the survey. Survey responses were transmitted over a secure, encrypted SSL connection and stored on a secure server. Participants received $1 for completing the questionnaire, and the opportunity to enter into a draw for $1,000, $100, and an iPod touch. The survey was terminated once 1,500 completed questionnaires were obtained. Secondary analysis of the data for this study was granted by the University of Guelph Research Ethics Board.

Measures

The *Trojan/SIECCAN Sexual Health Study* consisted of 69 items related to the sexual health of university students. For the purposes of the current investigation, the following survey items were included.

Demographics. Participants were asked to report their 1) gender; 2) age; 3) sexual orientation; 4) relationship status (not dating anyone, casual dating, committed dating, living together in a committed relationship, engaged, married, separated, widowed, divorced); 5) partner type at last sex, which consisted of the following options: one time sexual encounter (i.e., hook up/one night stand), sexual partner with whom you are friends with no commitment (i.e., friends with benefits), sexual partner with whom you occasionally meet for sex but for no other purpose (i.e., booty call), dating but not committed, committed dating, living together in a monogamous committed relationship, engaged, married; 6) university status (degree program and year); 7) province or territory of residence; and 8) their country of origin.

Preferred contraceptive method and contraceptive method at last PVI. Participants were asked to report their preferred method of contraception from a list of eighteen different methods (e.g., condoms, OCs, diaphragm, female condom). Participants were able to choose more than one preferred method. They also reported the method of contraception, if any, that they used at last PVI from the same list of 18 methods and were able to select more than one method, if needed.

Reasons for condom use and nonuse. Participants who used a condom at last PVI were asked to indicate the main reason they used a condom: response choices were "for birth control," "for STI protection," and "equally for birth control and STI protection." Those who had not used a condom at last sex were asked to indicate their main reason for not using a condom. Ten response choices were developed from the literature on condom nonuse and included "I know my partner does not have an STI," "I/my partner uses a different form of birth control," and "My partner did not want to use one."

Concern about STI and pregnancy. Participants were asked to indicate their concern about STI and pregnancy, on a 4-point Likert-type scale ranging from "not at all concerned" to "very concerned."

Access to condoms on campus. Participants were asked to rate how easily they could access condoms on their campuses, on a 4-point scale with responses ranging from "not at all easy" to "very easy."

Sexual Health Knowledge Scale (SHKS). Participants responded to 10 questions with "true," "false," and "I don't know" response options. Four questions focused on STI knowledge, two on conception and contraception, two on sexual problems, and two related to current patterns of sexual behaviour among young adults. Scores on the SHKS items were created by scoring 1 point for each correct response and 0 for incorrect or "don't know" responses. The total score was calculated by summing the scores across all 10 items. All items included an "I choose not to answer" option that was recoded as missing data in all analyses.

Data Analysis

Preferred contraceptive method was recoded to reduce the number of categories and to make comparisons between condom and hormonal contraceptive methods (categories were condom, OCs, other hormonal contraceptive, other method of contraception). Similarly, contraceptive use at last vaginal sex was recoded to make comparisons between condom use only, OC use only, condom use with OC, condom use and other method (not OC), OC and other method (not condom), only other method (not OC or condom) and no method.

Variables were dichotomized to determine associations between potentially protective factors for condom use and condom use at last sex. Specifically, concern about STI and pregnancy were recoded to contrast those who were very concerned with all others. Access to condoms was recoded as "very easy" against all others. Preferred method of contraception was recoded to contrast condom use versus all other methods. For the multivariate analysis, contraceptive use at last vaginal sex was recoded to contrast hormonal contraceptive use against all other methods so that any hormonal contraceptive use at last sex could be used as a control variable.

Item-level comparisons of condom use with dichotomized predictor variables were conducted using chi-square tests. Comparisons of condom use with continuous predictor variables were assessed using independent samples t-tests. Predictor variables obtaining screening significance ($p < .20$) at the bivariate level were entered into hierarchical logistic models.

Hierarchical logistic regression was used to determine significant predictors of condom use while controlling for partner type at last sex (categories ranging from casual to committed types entered as a continuous variable), age (continuous) and hormonal contraception use at last sex (yes/no). These control variables were selected because of known associations with condom

use, and were entered simultaneously into Block 1. Each of these control variables was significantly associated with condom use at last sex at the bivariate level, among both male and female participants and in the anticipated direction (data not shown). Separate models were constructed for men and women. Scores on the SKHS were entered into the regression analysis as a continuous predictor variable. All other predictors were entered into the analysis as dichotomized variables. All predictors were entered simultaneously in Block 2.

Results

Descriptive Findings

Just under half of the students reported that they were in committed dating relationships (48.5%); the remainder of the sample were not dating anyone (17.2%), casually dating (16.4%), living together (11.9%), or engaged or married (5.1%). The majority of students identified as heterosexual (96.2%), with a small number identifying as bisexual (3.2%), gay (1 .2%), lesbian (0%), or other (.5%) (Note that the sample for the current investigation includes only those students who reported that their most recent sexual encounter included PVI. For the total sample, the percentages of students who identified as gay, lesbian, bisexual, or other was higher).

Among those who reported a single preferred contraceptive method, condoms and OCs were most frequently reported. However, men were more likely than women to report condoms as their preferred contraceptive method (49.7% vs. 21.8%; $\chi^2(1) = 37.57$, $p = .001$) and women were more likely than men to report OCs (60.7% vs. 33.7%; $\chi^2(1) = 30.71$, $p = .001$) and hormonal methods generally (68.9% vs. 39.6%; $\chi^2(1) = 41.24$, $p < .001$) as their preferred contraceptive method (see Table 1).

Less than one-half of the sample (47.2%) reported using a condom at last PVI. It should be noted that the measure of condom use in this analysis included those who used only a condom and those who used a condom and any another method. Men were more likely than women to report condom use at last PVI; 55.4% vs. 42.3%; $\chi^2(1) = 10.34$, $p = .001$). Women were more likely than men to report OC use only (35.4% vs. 21.7%; $\chi^2(1) = 13.43$, $p < .001$) and OCs with condoms (23.8% vs. 15.8%; $\chi^2(1) = 5.75$, $p = .02$) at last PVI (see Table 2)**.**

Most of the sample (58.9%) reported that the main reason they used a condom at last sex was for birth control followed by equally for birth control and STI protection (35.1%) and STI prevention (6.0%). Participants predominantly indicated that the main reason they did not use a

condom was that they or their partner was using another method of birth control (65.9%, n = 222) (see Tables 3 and 4).

Bivariate associations between selected variables and dependent variable of condom use at last sex

Comparing those who used condoms at last sex with those who did not, condom users were significantly younger than condom nonusers. Specifically, among men, the mean age of condom users at last vaginal sex was 20.9 years; the mean age among nonusers was 21.4 years (t = 2.68 (df = 248), p = .005). For women, the mean age of condom users was 20.8 years; the mean age among nonusers was 21.4 (t = 3.32 (df = 394), p = .001).

Among men, scores on the 10-item knowledge scale were not significantly different between those who used condoms at last sex and those who did not. Specifically, condom users scored 4.53 and condom nonusers scored 4.47 out of 10 (t = .25 (df = 248), p = .80). For women who reported using condoms at last sex, the mean number of items correct on the same scale was 4.84. The women who did not report using condoms scored, on average 4.52; this difference was marginally significant (t = 1.91 (df = 394), p = .056).

Strong concern about unplanned pregnancy was significantly associated with condom use at last sex among men (p = .03) and marginally significant among women (p = .0*6*). The strongest bivariate predictor of condom use at last vaginal sex was selecting condoms as the preferred method of contraception. This was true for men and women (p's = <.001) (Table 5).

Multivariate associations between selected variables and dependent variable of condom use at last sex

The logistic regression analysis for men yielded a significant regression model, χ^2 (4) = 74.64, p < .001, which resulted in a Nagelkerke's R^2 of .51 for explaining condom use at last PVI (Table 6). Seventy-nine percent of participants were correctly classified with the model. A preference for condoms as a contraceptive method had a large effect (OR = 9.24, 95% CI 3.89 – 21.98). Hormonal contraceptive use at last vaginal sex had a negative effect (OR = 0.27, 95% CI 0.11 – 0.69) i.e., use of hormonal contraceptives was associated with noncondom use.

The logistic regression analysis for women yielded a significant regression model, χ^2 (6)

= 107.58, $p < .001$, which resulted in a Nagelkerke's R^2 of .45 for explaining condom use at last PVI (Table 7). Eighty-two percent of participants were correctly classified with the model. A preference for condoms as a contraceptive method had a very large effect (OR = 23.20, 95% CI 8.29 – 64.91). In other words, women who reported condoms as their preferred method of contraception were twenty-three times more likely to report using condoms at last vaginal sex. Scores on the SHKS (OR = 1.21, 95% CI 1.003 – 1.47) also significantly predicted condom use such that every one unit increase on the knowledge measure was associated with a 21% increased likelihood of condom use at last sex. Age (OR = .82, 95% CI 0.68 – .99) and relationship partner type (OR = 0.75, 95% CI .61 – 0.93) had negative effects. That is, older female participants and those that reported that their most recent sexual encounter occurred with a more committed partner type (e.g., committed dating versus a hook-up) were less likely to use condoms.

Discussion

The current study presents prevalence data on condom use and individual-level predictors of condom use at last PVI among a sample of 653 sexually active Canadian university students aged 18 to 24. Approximately one-half of participants reported condom use at last vaginal sex; men were significantly more likely to report condom use at last sex than were women. Men were more likely to report a preference for condoms as a contraceptive method, whereas women were more likely to report a preference for OCs or hormonal contraceptives more generally. The predominant reason reported for condom use at last PVI across all participants was birth control. At the bivariate level, condom users were younger, on average, than nonusers. Sexual health knowledge was associated with condom use among women, but not men. Concern about pregnancy was associated with condom use among men, but not women. Preference for condoms as a contraceptive method was associated with condom use at last PVI among both genders. Logistic regression models predicting condom use at last PVI were very strong, accounting for a large amount of variance (45-51%) and correctly classifying 79 to 82% percent of participants. Among both men and women, the strongest predictor of condom use at last PVI

was a preference for condoms as a contraceptive method; specifically, men and women who stated condoms were their preferred method were 9 and 23 times, respectively, more likely to use condoms at last PVI than those who selected another method. These relationships were found after controlling for age, relationship partner type and hormonal contraceptive use. Hormonal contraceptive use (for men) and older age, less sexual health knowledge, and being in a committed relationship (among women) were associated with slight decrements in the odds of condom use.

The most directly comparable data to the current study was carried out by Rotermann and McKay (2009), who examined condom use at last intercourse among unmarried/not living common law 20 to 24 year-old young adults participating in the *Canadian Community Health Survey* (CCHS). Although there were some differences in the demographic profile of the two samples (e.g., age, level of education), both examined condom use at last PVI among national samples of young adult Canadians. It is therefore noteworthy that the prevalence of condom use at last PVI among single young adult Canadians from the general population was higher in the 2003/2005 CCHS than in the 2012/2013 *Trojan/SIECCAN Sexual Health Study* of Canadian university students for both males (63.7% vs. 55.4%) and females (55.4% vs. 42.3%). Although these differences in rates of condom use at last PVI may be attributable to some extent to demographic differences between the samples or the shorter recall period in the current study, it is also possible that the results are at least partially attributable to the different time periods in which the two studies were conducted. That is, the lower rates of condom use in the 2012/2013 study compared to the 2003/2005 study may indicate that condom use among young adult Canadians is declining over time. Future research using comparable measures among demographically similar samples of young adult Canadians is required to more accurately assess

trends in condom use. Nevertheless, given that young adult Canadians are highly sexually active and carry a disproportionate burden of STI infection, the finding from the current study that less than half (47.2%) of Canadian university students report using a condom at last PVI is cause for concern.

Given that young adulthood is generally acknowledged as a time in which people are more likely to have a relatively high number of sequential sexual and relationship partnerships and that the prevalence of STI is correspondingly high (Public Health Agency of Canada, 2010), it is logical to assume that STI risk reduction is the primary motivation for condom use in this age group. However, the results of the current study clearly suggest otherwise. The predominant reason reported for condom use at last PVI across all participants was birth control. When study participants who had used a condom at last PVI were asked specifically why they did so, over half responded that the main reason was birth control, almost a third said a combination of birth control and STI prevention, while less than 10% cited STI prevention alone. Conversely, almost two thirds of those who did not use a condom indicated that their main reason for not doing so was that they or their partner used another form of birth control. Previous studies have suggested that unplanned pregnancy is a more salient concern for many young people than STI infection (e.g., Abel & Brunton, 2005).

Approximately one-half of men and one-quarter of women listed condoms as their preferred method of contraception. The observation that condoms are a popular choice for birth control among young adults is not a novel finding. Previous research from the Canadian Contraception Study indicated that 81% of 18 to 24 year old women evaluated condoms favorably (Fisher & Boroditsky, 2000). Both Black et al. (2009) and Fisher et al. (2004) found that condoms were among the most frequently used methods of birth control among young

Canadian women. The current findings suggest that positive attitudes towards condoms can translate into condom use. Among both genders, the strongest predictor of condom use at last PVI was a preference for condoms as a contraceptive method. The association between condoms as the most preferred contraceptive method and use of condoms at last PVI was stronger for women than men; highlighting the importance of women's acceptance of condoms. As women are thought to be the gatekeepers with regard to sex, determining where, when, and what kind of sex occurs (Sakaluk et al., 2013), it may also be that young, educated women also have the power to determine if condoms are used. In a study investigating the relationships between gender, power, and perceived difficulty implementing condom use among university students, the only significant gender difference in perceived difficulty implementing condom use favoured *men* perceiving greater difficulty than women (in casual relationships in particular) (Woolf & Maisto, 2008). Women felt as much, if not more, facility in negotiating condom use than did their male counterparts. The authors suggested that in a university setting women may not be disadvantaged in terms of relationship power. Further given the strength of the relationship between condom preference and condom use in the current study, particularly among women, it may be especially efficacious to target college women's condom use attitudes and beliefs in order to increase condom use on university campuses. Our study strongly suggests that, in this context, favourable attitudes towards condoms among women translate into condom use in dyadic relationships.

Sexual health knowledge was associated with condom use among women but not men. It should be noted that on several individual knowledge items related to STI, both male and female participants scored poorly. For example, less than half of students correctly answered items about chlamydia and human papillommavirus (data not shown). Overall knowledge was quite

low with participants answering, on average, 4 of 10 questions correctly. Previous research suggests that relevant knowledge about STI is best seen as necessary but insufficient to motivate STI risk reduction behaviour change (e.g., Albarracin et al., 2005; Fisher & Fisher, 1998). Our results suggest that this may be particularly the case for men; thus, it may be especially important that STI risk reduction interventions targeted at young men go beyond the provision of relevant factual information to include motivational and behavioural skill building opportunities, as recommended by the *Canadian Guidelines for Sexual Health Education* (Public Health Agency of Canada, 2008). One such behavioral intervention designed to promote the acceptance and consistent and correct use of condoms is *The Kinsey Institute Homework Intervention Strategy* which has been successfully pilot-tested on samples of heterosexual and gay men (Milhausen et al., 2011).

Previous research has indicated that university aged young adults' sexual and relational lives are characterized by a pattern of serial monogamy in which condom use is discontinued in favour of OCs each of a series of relationships over time (Bolton, McKay, & Schneider, 2010; Civic, 2000; Manlove, Ryan, & Franzetta, 2007). Indeed, this tendency to discontinue condom use within serially monogamous relationships is cited as a direct causal factor in the elevation of STI risk among heterosexual young adults (Misovich, Fisher, & Fisher, 1997). In a qualitative study of young adult women in Toronto, condoms were reported as being typically used at the beginning of dating relationships but discontinued in favour of OCs as a perception of monogamy and intimacy increased (Bolton, McKay, & Schneider, 2010). The transition to OCs was viewed by the women in the study as symbolic of commitment to a monogamous relationship. In a detailed study of the relationship characteristics associated with contraceptive method choice among young people, Kusunoki and Upchurch (2011) found that those in more

committed relationships were generally more likely to use hormonal methods and those in less committed relationships are more likely to use condoms. Further, among those in the most committed types of relationships (serious dating, cohabitating), rates of condom use and dual contraceptive use (condom and hormonal method) were lower among women but not among men. Similarly, in the current study, having more committed sexual partner type at last PVI was associated with a slightly reduced likelihood of condom use for women but not men. Compared to women, men in the current study were also more likely to cite condoms as their preferred method of contraception and therefore may be less likely to want to transition to OCs regardless of the type of relationship they are involved in. Additionally, in longer-term relationships it can be especially difficult to initiate or maintain condom use because of the implication that condom use implies mistrust or infidelity in an intimate relationship (East, Jackson, O'Brien, & Peters, 2007). This might be particularly true for women who cannot independently orchestrate condom use. As such, sexual health promotion interventions designed to reduce STI risk among university students should emphasize condom use negotiation skills within committed dating and cohabitating relationships. This skill acquisition may be important for female students who wish to translate their preference for condom use into action.

Limitations

Several limitations to the study should be noted. First, because the sample was comprised of university students, the findings cannot be generalized to the general population of similarly aged young adult Canadians. Although it is unlikely that levels of condom use are dramatically different between university students and similarly aged out of school young adults, there are demographic differences between the two groups that may affect condom use. In analyzing data on condom use at last intercourse among unmarried, not living common law Canadians aged 20

to 34, Rotermann and McKay (2009) found that while those with some post-secondary education were more likely to report condom use than those who had completed post-secondary education, the difference was no longer significant after multivariate analysis.

A second limitation of the study is that although the sample was drawn from universities across Canada, some regions of the country were underrepresented (e.g., British Columbia) or not included (there are a small number of degree programs available in the northern territories). Therefore, the data cannot be considered to be representative of the Canadian university student population as a whole. Nevertheless, this study surveyed students attending universities in most of the different regions of Canada.

As with all studies of condom use, this study relied on the self-reported data of people who were willing to complete a questionnaire that included information about their sexual behaviour. Nevertheless, this study was designed to maximize the accuracy of responses by utilizing an event level measure of condom use and by limiting the recall period to 3 months.

Conclusions

Most Canadian young adults are sexually active, many with more than one intercourse partner in the previous year (Rotermann & McKay, 2009), a finding replicated in the current study (data not shown). Given that less than half of the students surveyed in the current study reported condom use at last PVI, the findings strongly suggest that Canadian university students underestimate their risk for STI or do not consider it when making decisions to use or not use condoms. Educational programs to raise STI awareness and promote condom use to reduce STI risk are urgently needed on Canadian university campuses. Programs to promote condom use should also emphasize that condoms are effective in preventing pregnancy and are a popular method of birth control among young adults in Canada. Interventions must transform knowledge of condom effectiveness (participants in the current study perceived, on average, condoms to be

95% effective in preventing pregnancy (data not shown) and favorable attitudes regarding condoms to a preference for condoms above other methods. The university years may be ideal times to launch interventions to increase condom use as this period provides the last opportunity to develop sexual health skills and knowledge in an educational setting (Taylor, McCarthy, Herbert & Smith, 2009).

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Table 1

Preferred contraceptive method (N = 449)

	Men % (n)	Women % (n)
Condom	49.7 (84)	21.8 (61)
Oral contraception	33.7 (57)	60.7 (170)
Other hormonal contraception	5.9 (10)	8.2 (23)
Other method	10.7 (18)	9.3 (26)

Note. $\chi^2(3) = 41.58$, $p = .001$

Table 2

Contraceptive method at last vaginal sex (N = 635)

	Men % (n)	Women % (n)
Condom only	35.8 (86)	15.2 (60)
Oral contraception only (OC)	21.7 (52)	35.4 (140)
Condom and OC	15.8 (38)	23.8 (94)
Condom and other method (not OC)	3.8 (9)	3.3 (13)
OC and other method (not condom)	2.5 (6)	3.8 (15)
Only other method (not OC or condom)	8.8 (21)	10.6 (42)
No method	11.7 (28)	7.8 (31)

Note. $\chi^2(6) = 45.32$, $p < .001$

Table 3

Main reason for condom use among those using a condom at last vaginal sex (N = 302)

	Men % (n)	Women % (n)
Birth control	62.0 (85)	56.4 (93)
STI prevention	8.8 (12)	3.6% (6)
Equally birth control and STI prevention	29.2 (40)	40.0 (66)

Note. $\chi^2(2) = 6.19$, $p = .045$; 2x2 comparisons (gender x method) ns.

Table 4

Main reason for noncondom use among those not using a condom at last vaginal sex (N = 337)

	% (n)
I know my partner does not have an STI	9.2% (31)
I/my partner uses a different form of birth control	65.9% (222)
I am not concerned about unintended pregnancy	2.7% (9)
My partner did not want to use one	3.0% (10)
I don't like the feel of them	5.0% (17)
I don't like using them, period	3.3% (11)
I did not have one with me	4.2% (14)
I did not want to lose the spontaneity	.9% (6)
I was under the influence of alcohol/drugs	1.8% (14)
Other	4.0%

Note. $\chi^2(9) = 11.24$, $p = .26$

Table 5

Bivariate associations between selected dichotomous correlates and condom use at last vaginal sex

	Male		Female	
	% using condoms at last sex	*p*	% using condoms at last sex	*p*
Concern about STI				
Very concerned	62.5	.33	46.2	.40
< Very concerned	54.0		41.1	
Concern about pregnancy				
Very concerned	66.2	.03	49.6	.06
< Very concerned	50.9		39.4	
Access to condoms				
Very easy	54.7	.61	49.1	.53
< Very easy	58.3		45.3	
Preferred method of contraception				
Condoms	82.3	.001	86.7	.001
Other methods	21.7		20.6	

Table 6

Logistic regression predicting condom use at last vaginal sex among male university students

	B	Wald	OR	95% CI
Partner type at last sex	-.163	1.54	.85	.66 – 1.10
Hormonal contraceptive use	-1.30	7.54	.27**	.11 - .69
Age	-.16	1.56	.85	.66 – 1.10
Concern about pregnancy	.75	2.75	2.11	.87 – 5.09
Condom preference	2.22	25.33	9.24***	3.89 – 21.98

$^{\star}p < .05$, $^{\star\star}p < .01$, $^{\star\star\star}p < .001$.

Table 7

Logistic regression predicting condom use at last vaginal sex among female university students

	B	Wald	OR	95% CI
Partner type at last sex	-.28	6.76	.75**	.61 - .93
Hormonal contraceptive use	-.22	.25	.81	.35 – 1.87
Age	-.20	4.25	.82*	.68 - .99
Concern about pregnancy	.25	.50	1.28	.65 – 2.53
Condom preference	3.14	35.85	23.20***	8.29 – 64.91
SKHS score	.19	3.96	1.21*	1.003 – 1.47

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.