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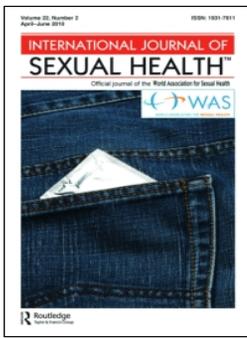
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Psychosocial Correlates of Condom Use Intentions among Junior High School Students in the Bolgatanga Municipality of Ghana

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ABSTRACT

Objectives: We explored sociodemographics, sexual experience, and psychosocial factors influencing condom use intentions of adolescents in Northern Ghana. **Methods:** Based on social cognitive theories and previous empirical studies investigating condom use, a cross-sectional survey was conducted among 2,018 adolescents (*M age = 15.8 years*) in Bolgatanga, Ghana. Correlations and multinomial logistic regressions were performed. **Results:** Findings showed that attitudes toward condom availability, injunctive norms toward condom use, sex experience, perceived susceptibility towards STIs, and perceived behavioral control toward buying as well as using condoms differentiated between people with different levels of intentions to use condoms. **Conclusions:** Implications for intervention development are discussed.

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Introduction

HIV (human immunodeficiency virus) and AIDS (acquired immune deficiency syndrome) had reached epidemic levels in most parts of Africa by the end of the last century. Current estimates are that half of all incidences of HIV occur in young people below 25 years, and 80% of AIDS cases worldwide affect those aged between 15 and 24 years, the majority of whom live in sub-Saharan Africa (UNAIDS, 2014). Among sub-Saharan countries in Africa, Ghana is one of the countries confronted with increasingly high rates of sexually transmitted infections (STI) among its adolescent population. Among sexually experienced young men and women aged 15 to 24 years, one out of four females and one out of seven males reported having been infected with an STI or having symptoms of STIs (Ghana Statistical Service, 2009). National HIV prevalence in Ghana was estimated at 1.3% in 2013, with prevalence in the Upper East region reaching 1.7% (Ghana AIDS Commission [GAC], 2014). Moreover, with an overall HIV prevalence among sex workers estimated at 11.1% in 2011 (GAC, 2012), there is a significant reservoir of HIV that can easily spread to the general population.

Another problem affecting adolescents in Ghana is teenage pregnancies. According to the Ghana Health Service annual report, each year, approximately 750,000 teenagers between the ages of 15 and 19 get pregnant. In the Upper East Region, records from the Ghana Health Service indicate that in 2012, 13.3% of girls had babies during their adolescent years. It has been acknowledged that teenage pregnancy not only increases health risks for the teenage mother and her (unborn) child (Awusabo-Asare, Abane, & Kumi-Kyere, 2004), but also disproportionately disrupts education for girls in northern Ghana (Blunch, 2011; Sutherland-Addy, 2002; Tuwor & Sossou, 2008).

Correct and consistent condom use, as compared to other forms of contraception, has been found to prevent both STIs and unintended pregnancies (Crosby, DiClemente, & Wingood, 2001; Steiner & Cates, 2006). However, evidence shows that condom use remains low in Ghana. An analysis of data from the Ghana Demographic and Health survey showed that the proportion of women reporting condom use at last sexual intercourse was 15% in urban areas and 10% in rural areas (Baiden & Rajulton, 2011). In another study conducted in four African countries, the proportion of young urban men reporting

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consistent condom use in the three months preceding the survey was 47% in Ghana. The authors of this study reported that age, school attendance, level of sex education received in school, and exposure to radio were all significant predictors of condom use (Bankole, Ahmed, Neema, Ouedraogo, & Konyani, 2007).

In order to change behavior and increase condom use among adolescents, thereby protecting them from STIs and unintended pregnancies, gaining insight into the factors that influence the use of condoms is vital. The study carried out by Bankole and colleagues (2007) illustrates that sex education does contribute to increased condom use, a finding consistent with other publications (Eisenberg, Bernat, Bearinger, & Resnick, 2008; Kirby, 2008). Our study explores the antecedents of condom use among adolescents in the Upper East Region of Ghana in order to guide the future development of theory- and evidence-based sexual risk reduction interventions (Bartholomew, Parcel, Kok, Gottlieb, & Fernández, 2011).

Several social cognitive theories have been used to explain sexual risk behavior within the African context (Nyembezi et al. d 2014; Rijdsdijk et al., 2012; Schaalma et al., 2009; Sialubanje, Massar, Hamer, & Ruiter, 2014). Examples include the Theory of Planned Behavior (Fishbein & Ajzen, 2010), Social Cognitive Theory (Bandura, 1998), the AIDS Risk Reduction Model (ARRM) (Catania, Kegeles, & Coates, 1990), and the Health Beliefs Model (HBM) (Rosenstock, 1974). These theories generally hold that behavior is primarily determined by motivation (intention) to undertake the behavior, and that intention is, in turn, determined by an individual's evaluation of the outcomes of the behavior (attitude), the behavior and opinions of important others (perceived norms), and personal control over performing the behavior (perceived behavioral control [PBC]). Bandura's construct of self-efficacy places extra emphasis on the extent to which a person feels confident that he or she can successfully perform the target behavior. Both Rosenstock's HBM and Catania and associates' ARRM have emphasised the predictive value of perceived risk as a motivation for action related to sexual behavior.

Previous empirical research in West Africa has confirmed the role of these determinants in predicting condom use in young people (Adih and Alexander, 1999; Bosompra, 2001; Giles, Liddell, & Bydawell, 2005; Meekers & Klein, 2002). However, as the number of studies is limited and/or data are

outdated, more up-to-date research is needed. Importantly, studies focusing on condom use among young people in Western Africa thus far seem to have neglected the powerful role of affect in influencing adolescent sexual behavior (Lawton, Conner, & McEachan, 2009). Since discussing sex and buying or using condoms can elicit strong emotional responses from adolescents in a culturally inhibited environment, affective beliefs could be more potent predictors of both intentions and behavior than cognitive beliefs. Thus, in this study, we distinguish between affective or experiential attitude, which refers to an individual's emotional response toward performing a behavior, and cognitive attitude, which refers to beliefs, knowledge structures, perceptual responses, and thoughts about the consequences of performing the behavior (Fishbein & Ajzen, 2010).

Many studies exploring condom use have looked at determinants in terms of their broad conceptualizations: attitude toward condom use, self-efficacy toward condom use, and so forth. These more general psychosocial measures do not provide enough details for intervention development. The influence of these variables on condom use may well depend on the specific subbehaviors involved (such as buying condoms, having them available, and discussing condom use with a sexual partner), that either facilitate or inhibit the use of condoms (Bryan, Fisher, & Fisher, 2002). Understanding the nature of these preparatory behaviors and the practical obstacles that may prevent them from being executed can further contribute to the development of empirically targeted interventions designed to promote such behaviors. Using behavior-specific measures, the present study examined the antecedents of condom use intentions among junior high school students in the Bolgatanga Municipal area of Northern Ghana.

Method

The present study draws on the baseline survey of an effect evaluation of the SPEEK programme, a sexual health education program for Ghanaian youth (see Krugu, Mevissen, Debpuur, & Ruiter, in progress). The baseline survey assessed the psychosocial determinants of adolescent condom use intentions before the introduction of the SPEEK programme in September 2012.

Participants

Participants in this study were 2,081 junior high school students (54% female) from the Bolgatanga municipality, Upper East, Ghana. The mean age of the participants was 15.8 years ($SD = 1.89$). The majority of the respondents indicated their religion to be Christianity (79.6%), followed by traditional worship (11.2%), and Islam (8.6%); 0.6% of respondents were affiliated with other religions. In all, 617 respondents (29.6%) indicated that they had had sexual intercourse, out of which 24% ($N = 148$) indicated that they had used a condom the last time they had had sex. Another 28.4% ($N = 175$) reported either having had a pregnancy or having impregnated someone. Among those with sexual experience, 65.8% had sexual debut at age 15 or younger.

Procedure

All 21 junior high schools (JHS) in the ten communities in the Bolgatanga municipality where SPEEK was to be implemented were approached and invited to participate in the survey. After consent from the Ghana Education Services authorities, approximately 2,500 JHS students were invited to participate in the study. They were provided with background information about the study (including the voluntary, anonymous, and confidential nature of their participation), and parental informed consent forms were provided for them to take home. Only those students who returned completed parental informed consent forms were invited to complete the questionnaires. Students who did not return parental consent forms were asked to stay outside the classroom during questionnaire administration. In total, 2,356 (94.2%) of students returned completed parental consent forms and were then given child assent forms to complete.

Subsequently, 2,324 students (98.64%) returned completed child assent forms and were provided with questionnaires to complete in classrooms. Although we surveyed all participants attending junior high schools in the participating communities, the analysis is limited to respondents within the age range of 10 to 20 years—a range that covers most definitions of adolescence. As a result, nine (0.39%) participants outside the desired age range were excluded from analyses.

During data cleaning, we found that 165 participants had missing data for the background variables of age, gender, religion, and sexual experience,

and 69 participants had more than 20% missing data in the theoretical constructs (intention toward condom use, PBC toward condom use, etc.). These participants ($N = 234$) were also excluded from analyses, leaving a final sample of 2,081 participants to be included in the analyses. Logistic regression analyses were done to check for selective dropout on the theoretical constructs using the percentages of the missing values as the outcome measure (with 0 representing students less than 20% drop out and 1 representing those with more than 20% drop out). The analyses showed no selective drop out based on age, gender, religion, or sexual experience ($p > .08$).

Participants received a half-page description of the project, the survey, and the voluntary nature of their participation. The description outlined the project aim of reducing sexual risk behaviors and emphasized the anonymity and confidentiality of participation. In addition, the project and the survey were further explained to participants by trained research assistants. To ensure student privacy, school teachers were not present in the classrooms during survey administration, and each student sat at a separate desk. Research assistants (not personally known to the students) were present to ensure that students did not discuss questions among themselves and to explain the questions both in English and in the local language (Gurune). The study was approved by the Ethics Review Board of Maastricht University in the Netherlands and the Ghana Health Services ethical committee in Accra.

Measures

The measures were derived from a survey previously used in South Africa and Uganda to measure condom use intentions among adolescents (Rijsdijk et al., 2012). The development of the original survey was based on the same psychosocial theories mentioned in our introduction, and the social-psychological constructs matched those found in the reported empirical studies. To assess how easy it would be for participants to understand the questions included in the survey, it was pretested on a representative sample of adolescents ($N = 50$) from a school in Bolgatanga. This pretest data was not included in the final study. The pretest resulted in minor changes, such as the rephrasing of certain questions to make their meaning clearer.

The survey included items assessing sociodemographic variables, sexual experience, and psychosocial measures. For the demographic measures, an open question (“How old are you?”) required the participants to provide their age. Participants were asked to tick the option male or female to indicate their sex. With regard to religion, they were asked to select from: Traditional worship, Islam, Christianity, or Other. The answer options for religion were recoded into a binary scale with 1 representing Christianity (largest group) and 0 for all others.

Past sexual experience was measured by the item: “Have you ever had sexual intercourse?” (0 = No; 1 = Yes). We defined sexual intercourse for participants as “when a man or boy inserts his penis into a woman’s or girl’s vagina.” For those with sexual experience in accordance with this definition, additional questions were asked about their age at sexual debut (“How old were you when you had sexual intercourse for the first time?”), their use of condoms (“Did you use a condom the last time you had sex?”: 0 = Never; 1 = Always), and pregnancy experience (“Have you ever been pregnant or made someone pregnant?”: 0 = None; 1 = once; 2 = 2 times or more; 3 = I don’t know, which was recoded into 0 = No or don’t know; 1 = Once or more than once. The answer options “never” and “always” for the question on condom use experience was later detected to be inappropriate (a better option would have been a simple “yes” or “no”). Therefore, condom use experience was excluded from the analyses. No questions on sexual orientation or anal sex were included because no honest answers were expected based on the high stigma associated with homosexuality and anal sex in the study area (Academy for Educational Development [AED], 2008).

Table 1 provides an overview of the psychosocial measures, including the items and reliability scores (the full questionnaire is available from the first author upon request). The psychosocial measures included cognitive- and affect-oriented measures and used five-point Likert scales, except for the knowledge items, which were measured on a three-point scale (true, false, and don’t know). Psychosocial items comprised of knowledge (actual and perceived), attitude (cognitive and affective) toward condom use and its availability, perceived behavioral control (PBC) toward condom use, buying condoms, and dealing with negative feelings when buying condoms, perceived STI risk, perceived norms (both injunctive and

descriptive), and intention towards condom use. These psychosocial items were recoded such that higher scores reflected a stronger presence of the variable in question. Knowledge items were recoded into: 0 = false answer or don’t know, 1 = correct answer, and combined in sum scores. For psychosocial measures consisting of more than one item, reliability analyses were performed. For each measure, scores on items that showed sufficient internal consistency (Cronbach’s alpha $\geq .60$ for three or more items; Pearson correlation coefficient $> .30$ for two items) were averaged into one single index. Mean scores for measures were calculated for each participant if more than half of the items that made up one measure were answered. No data imputation was done to retain the missing items in a measure for a specific participant.

Data analysis

SPSS Version 21.0 was used for the data analysis. First, descriptive analyses, frequencies, and mean scores were calculated. The bivariate associations among sociodemographic, psychosocial, sexual experience, and intention measures were calculated using Pearson correlation coefficients. Variables that showed significant univariate associations with intention to use condoms ($p \leq .01$) were included in a multinomial logistic regression analysis to identify the effect of the independent variables on the probability of (1) having no intention to use condoms versus not having made a clear decision about condom use, and (2) having high intention of using condoms versus not having made a clear decision about condom use. The creation of this intention measure was based on tertile split scores for the original intention measure following its u-shaped distribution. The respondents were split into three groups: those with no/low intention to use condoms (intention toward condom use score < 3.00 ; $N = 469$), those expressing no clear decision about condom use ($3 \leq$ intention toward condom use < 4.00 ; $N = 489$), and those with high intention to use condoms (intention toward condom use ≥ 4.00 ; $N = 626$). To explore possible differences between female and male participants in the predictors of intention to use condoms, the correlation and regression analyses were repeated for each gender group.

Blockwise multinomial logistic regressions were conducted in order to assess the contribution of socio-cognitive variables (Model 1), additional affective

Table 1. Overview of psychosocial constructs measured in the survey.

Variable	Number of items	Reliability	Questions (<i>answer scale</i>)
Intention condom use	3	$\alpha = 0.65$	Which of the following best describes your plans about you or your partner using a condom the first/next time you have sexual intercourse? Choose the one answer that best describes your plans. 1. I will surely use a condom the next time I have sex. 2. I will surely use a condom the next time I have sex even if my partner does not want to. 3. I plan to use a condom the next time I have sex. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
PBC condom use	6	$\alpha = 0.68$	1. I am sure that I can use a condom every time if I have sexual intercourse. 2. I am sure I can check the instructions on package insert for condom use. 3. How sure are you that you could use a condom correctly or explain to your partner how to use a condom correctly? 4. Imagine that you and your boyfriend or girlfriend have been having sex but have not used condoms. You really want to start using condoms. How sure are you that you could tell your partner you want to start using condoms? 5. Imagine that you are having sex with someone you just met. You feel it is important to use condoms. How sure are you that you could tell that person that you want to use condoms? 6. Imagine that you or your partner uses birth control pills to prevent pregnancy. You want to use condoms to keep from getting STIs or HIV. How sure are you that you could convince your partner that you also need to use condom? (1 = <i>totally sure</i> , 5 = <i>I don't know</i>)
Cognitive PBC buying condoms	2	$r = 0.37$	1. If you wanted a condom, how sure are you that you could go to the store and buy one? 2. If you wanted a condom and you went to a store to get one, how sure are you that you could ask for condom the display section to make your choice? (1 = <i>totally sure</i> , 5 = <i>I don't know</i>)
Affective PBC buying condoms	1	n.a.	1. I am sure that I can deal with possible disadvantages such as embarrassments caused by observers when buying condoms. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
PBC condom availability	1	n.a.	1. If you decided to have sex, how sure are you that you could have a condom with you when you needed it? (1 = <i>totally sure</i> , 5 = <i>I don't know</i>)
Perceived STI risk	2	$r = 0.40$	1. If I have sexual intercourse without a condom, I am likely to contract HIV. 2. If I have sexual intercourse without a condom, I am likely to get infected with a sexually transmitted infection other than HIV. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
Injunctive norm condom use	2	$r = 0.37$	1. Most of my friends believe condoms should always be used if a person of my age has sex. 2. Most of my friends believe condoms should always be used if a person my age has sex, even if the two people know each other very well. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
Descriptive norm condom use	1	n.a.	1. In your opinion, of those students your age who have sex, how many of them use condoms most of the time? (1 = <i>None of them</i> , 5 = <i>Almost all of them</i>)
Cognitive attitude condom use	5	$\alpha = 0.62$	1. I believe condoms should always be used if I have sex. 2. I believe condoms should always be used when I have sex, even if the girl uses birth control or family planning pills. 3. I believe that always using a condom during sexual intercourse is..... 4. Sex wouldn't feel as good with condoms, but I think it is still better to use condoms. 5. I believe condoms should always be used when I have sex, even if I know the other person very well. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
Cognitive attitude condom availability	2	$r = 0.33$	1. Having condoms with me all the time is important. 2. It is important to have condoms available so that when things start getting steamy, I'll be ready to protect myself. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
Affective attitude condom availability	1	n.a.	1. I would feel uncomfortable carrying condoms with me. (1 = <i>strongly agree</i> , 5 = <i>strongly disagree</i>)
Actual knowledge condom use	9	sum score	1. A girl can get pregnant the first time she has sex. 2. If I have vaginal sexual intercourse without a condom or another contraceptive, this may lead to pregnancy. 3. Just only one incident of unsafe sex is all it takes to get pregnant. 4. Getting the penis out just before ejaculation, is a safe method of preventing pregnancy

(continued)

Table 1. (Continued)

Variable	Number of items	Reliability	Questions (answer scale)
Perceived knowledge condom use	3	sum score	5. Safe methods of contraception include the rhythm method, using spermicides, and practices like “doing it standing up” or “coughing a lot afterwards” or “trying not to come.” 6. Most people do know when/if they are infected with HIV/STIs 7. After unsafe sex or when you are in a serious relationship and you want to stop using condoms, it is necessary to do an HIV/STI test. 8. When someone has HIV or other STIs, this can be seen from the person’s appearance. 9. Some STIs put you at higher risk of getting infected with HIV. (1 = true, 2 = false, and 3 = I don’t know) 1. I can explain safe sex and unsafe sex is in the context of STI/HIV and pregnancy 2. I know the contraception options available to me in this community. 3. I know where to go for a contraceptive methods or counseling when I need to. (1 = true, 2 = false, and 3 = I don’t know)

beliefs (Model 2), and past behavior and demographics (Model 3) in explaining condom use intention. To demonstrate differences in classification accuracy, the Nagelkerke index was chosen (Cohen, Cohen, West, & Aiken, 2003). Because the relatively large number of participants resulted in high statistical power in the analyses, results were considered significant at $p < .01$.

Results

Bivariate analyses

Table 2 presents the bivariate associations found among the psychosocial and demographic measures using Pearson r correlations.¹ With the exception of religion, age at sexual debut, and condom use, all items included in the analyses significantly correlated with the intention to use condoms, with $r = .10$ – $.23$ indicating a small effect, $r = .24$ – $.36$ indicating a moderate effect, and $r \geq .37$ indicating a large effect (Cohen, 1988). The strongest associations with intention to use condoms were found for perceived risk of STI infection, perceived behavioral control toward condom use, and injunctive norms toward condom use. Cognitive attitude toward condom use, cognitive attitude toward condom availability, cognitive perceived behavioral control toward buying condoms, and perceived behavioral control with regard to condom availability all moderately correlated with condom use intention. Small effect sizes were noted for both actual and perceived knowledge toward condom

use, affective attitude toward condom availability, perceived behavioral control toward dealing with negative feelings when buying condoms, descriptive norm toward condom use, as well as gender, sex experience, and pregnancy experience. All significant correlates related positively to intention except for pregnancy experience. Separate correlation analyses for female and male participants found no differences between both groups in the pattern of findings.

Multivariate analyses

Multivariate logistic regression analyses were conducted to explore the unique contributions of the study variables and the influence of these variables on intention to use (or not use) condoms. The results of the regressions are shown in Table 3a (females) and Table 3b (males).² Significant results ($p < .01$) of the final model are described, first for the total sample and then for the two gender groups.

No intention to use condoms versus no clear decision about condom use

Participants were more likely to have no intention to use condoms than they were to be undecided about condom use when they reported a lower injunctive norm toward condom use and when they reported weaker affective attitudes toward condom availability. Furthermore, participants without sexual experience were significantly more likely to have no intention to use condoms than those with sexual experience.

¹ Repeating the correlation analyses with scales in which participants with more than 20% missing items (69 participants) were included did not reveal any significant differences in results.

² Repeating these regressions using scales in which participants with more than 20% missing items (69 participants) were included resulted in the effect of sex experience, risk perception, and perceived behavioral control towards buying condoms no longer being significant, p 's $> .02$, for the total sample).

Table 2. Means, standard deviations and correlations of the determinants of intention to use condoms.

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Intention to use condoms	3.39 (1.03)																			
Actual knowledge condom use	4.43 (1.77)	.13**																		
Perceived knowledge condom use	1.40 (0.98)	.22**	.24**																	
Perceived STI risk	3.35 (1.15)	.37**	.15**	.13**																
Cognitive attitude condom use	3.82 (0.80)	.34**	.20**	.19**	.31**															
Cognitive attitude condom availability	3.38 (1.08)	.34**	.08**	.17**	.28**	.39**														
Affective attitude condom availability	3.08 (1.44)	.12**	-.01	.07**	.06**	.06**	.09**													
PBC condom use	3.46 (0.82)	.45**	.20**	.23**	.41**	.43**	.38**	.05*												
Cognitive PBC buying condoms	3.36 (1.14)	.29**	.12**	.18**	.19**	.24**	.26**	.04	.44**											
Affective PBC buying condoms	3.12 (1.34)	.22**	.04	.13**	.14**	.14**	.14**	.05*	.27**	.28**										
PBC condom availability	3.40 (1.36)	.28**	.12**	.13**	.24**	.25**	.27**	.02	.41**	.35**	.24**									
Injunctive norm condom use	3.54 (1.09)	.37**	.13**	.19**	.32**	.37**	.28**	.03	.40**	.26**	.15**	.24**								
Descriptive norm condom use	2.41 (1.34)	.10**	-.01	.01	.02	.01	.02	-.01	.01	.03	.02	.05*	.03							
Age	15.8 (1.89)	.09**	.00	.07**	.13**	.13**	.09**	-.04	.14**	.09**	.04	.05*	.17**	.05*						
Gender	1.46 (0.50)	.14**	.04	.04*	.05*	.10**	.14**	.07**	.10**	.15**	.09**	.08**	.09**	.07**	.06**					
Religion	2.70 (0.67)	-.05*	-.02	.02	.00	-.01	-.03	-.01	-.00	.09**	-.03	-.02	.02	-.03	-.09*	-.19*				
Sex experience	0.30 (0.46)	.10**	.02	.08**	.00	.06**	.05**	.05**	.04	.05**	.09**	.07**	.05**	.08**	.10**	.14**	.12**			
Pregnancy experience	2.13 (1.32)	-.17**	-.17**	-.13**	-.17**	-.15**	-.10**	.00	-.18**	-.08**	-.07**	-.07**	-.17**	.08**	-.00	-.03	-.01	.03		
Age at sexual debut	14.9 (2.41)	.01	.15**	.10*	.10*	.11*	.05	-.04	.11*	.06	-.05	.10*	.15**	.02	.35**	.06	-.01	.c	-.10*	
Condom use experience	0.24 (0.43)	.05	.05	.05	.08*	.07	.06	.09*	.05	.02	.05	.10*	.12**	.09*	.11**	.04	-.03	.c	.00	.50**

Notes:

* $p < .01$; ** $p < .001$. PBC = Perceived Behavioural Control, c = cannot be computed because one of the variables is constant.

Table 3. Multi-nominal logistic regression with intention to use condoms (no intention – no clear decision – strong intention) as outcome measure.

Predictors	Model 1 ^a				Model 2 ^b				Model 3 ^c			
	b	SE	Wald	p	b	SE	Wald	p	b	SE	Wald	p
No intention to use condoms vs. no clear decision about condom use (N = 469 vs. N = 489)												
Actual knowledge condom use	.02	.04	.39	.53	.03	.04	.51	.48	.03	.04	.41	.52
Perceived knowledge condom use	-.06	.07	.74	.39	-.03	.07	.12	.73	-.00	.08	.00	.96
Perceived STI risk	-.20	.06	2.34	.13	-.06	.07	.97	.32	-.07	.07	1.19	.28
Cognitive attitude condom use	-.23*	.10	5.65	.02	-.23*	.10	5.35	.02	-.21*	.10	4.51	.03
Cognitive attitude condom availability	-.07	.07	1.17	.28	-.05	.07	.47	.49	-.04	.07	.37	.54
PBC condom use	-.24	.11	5.13	.02	-.25*	.11	5.03	.03	-.26*	.11	5.15	.02
PBC buying condoms	.01	.07	.02	.89	.03	.07	.21	.65	.03	.07	.23	.63
PBC condom availability	-.14*	.06	6.89	.01	-.12	.06	4.55	.03	-.12*	.06	4.37	.04
Injunctive norm condom use	-.23**	.07	11.16	.00	-.25**	.07	13.05	.00	-.25**	.07	12.04	.00
Descriptive norm condom use	-.10	.05	3.89	.05	-.11*	.05	4.40	.04	-.11*	.05	4.37	.04
Affective attitude condom availability					-.21**	.05	18.76	.00	-.20**	.05	16.01	.00
PBC dealing with negative feelings when buying condoms					-.14*	.06	6.44	.01	-.13*	.06	5.10	.02
Gender									-.24	.14	2.80	.09
Sexual experience									-.47**	.16	8.55	.00
Pregnancy experience									.05	.05	.96	.33
Age									.04	.04	1.02	.31
Strong intention to use condoms vs. no clear decision about condom use (N = 626 vs. N = 489)												
Actual knowledge condom use	.02	.04	.23	.63	.02	.04	.26	.61	.01	.04	.12	.73
Perceived knowledge condom use	.13	.07	3.83	.05	.15*	.07	4.42	.04	.15*	.07	4.49	.03
Perceived STI risk	.19**	.06	9.37	.00	.18*	.06	7.89	.01	.17*	.06	7.47	.01
Cognitive attitude condom use	.11	.10	1.33	.25	.11	.10	1.25	.26	.11	.10	1.15	.28
Cognitive attitude condom availability	.19*	.07	8.02	.01	.18*	.07	6.79	.01	.19*	.07	6.90	.01
PBC condom use	.49**	.10	22.80	.00	.51**	.11	23.51	.00	.51**	.11	23.09	.00
PBC buying condoms	.18**	.06	8.58	.00	.18**	.06	8.17	.00	.17*	.07	6.91	.01
PBC condom availability	.02	.05	.21	.65	.02	.05	.08	.79	.01	.05	.04	.84
Injunctive norm condom use	.15*	.07	5.06	.02	.16*	.07	5.61	.02	.16*	.07	5.15	.02
Descriptive norm condom use	.10*	.05	4.68	.03	.10*	.05	4.26	.04	.10*	.05	4.09	.04
Affective attitude condom availability					-.02	.05	.14	.71	-.02	.05	.15	.70
PBC dealing with negative feelings when buying condoms					.00	.05	.00	.97	.01	.05	.01	.91
Gender									.00	.13	.00	.20
Sexual experience									.05	.14	.13	.72
Pregnancy experience									-.05	.05	.94	.33
Age									-.01	.04	.10	.76
Pseudo R ²	0.31				0.33				0.33			
Classification accuracy (%)	54.40				55.30				55.50			

Notes. PBC = Perceived Behavioral Control.

* P < 0.05, two-tailed; **P < 0.01, two-tailed

^a Model 1 refers to multi-nominal logistic regression with only the sociocognitive variables as predictors

^b Model 2 refers to multi-nominal logistic regression with the sociocognitive variables and additional affective beliefs as predictors

^c Model 3 refers to multi-nominal logistic regression with the sociocognitive variables, additional affective beliefs and demographic, and past behaviour as predictors

Separate analyses for male and female participants found for females a unique additional contribution for descriptive norm toward condoms use ($b = -.18$, $SE = .07$, $p = .01$), with lower descriptive norms making it more likely that girls have no intention to use condoms, whereas the contributions of injunctive norm ($b = -.22$, $SE = .10$, $p = .02$), affective attitude ($b = -.16$, $SE = .06$, $p = .02$), and sexual experience ($b = -.53$, $SE = .22$, $p = .02$) approached significance at the $p < .01$ level. For male

participants, the contributions of injunctive norm ($b = -.31$, $SE = .11$, $p = .01$) and affective attitude ($b = -.27$, $SE = .08$, $p < .01$) remained significant, whereas sexual experience had no significant contribution ($b = -.45$, $SE = .23$, $p = .06$).

High intention to use condoms versus no clear decision about condom use

Participants were more likely to have high intentions to use condoms than to be undecided about

Table 3A. Multi-nominal logistic regression with females' intention to use condoms (no intention – no clear decision – strong intention) as outcome measure.

Predictors	Model 1 ^a				Model 2 ^b				Model 3 ^c			
	b	SE	Wald	p	b	SE	Wald	p	b	SE	Wald	p
No intention to use condoms vs. no clear decision about condom use (N = 299 vs. N = 257)												
Actual knowledge condom use	.04	.05	.62	.43	.04	.05	.73	.39	.04	.05	.64	.42
Perceived knowledge condom use	-.11	.10	1.31	.25	-.08	.10	.63	.43	-.05	.10	.22	.64
Perceived STI risk toward condoms	-.15	.08	3.22	.07	-.10	.09	1.33	.25	-.10	.09	1.29	.26
Cognitive attitude condom use	-.22	.12	3.31	.07	-.24	.13	3.58	.06	-.22	.13	2.89	.09
Cognitive attitude condom availability	-.12	.09	1.83	.18	-.11	.09	1.28	.26	-.12	.09	1.65	.10
PBC condom use	-.29*	.14	4.35	.04	-.31*	.14	4.70	.03	-.32	.15	4.80	.03
PBC buying condoms	.02	.09	.05	.82	.03	.09	.13	.72	.03	.10	.12	.73
PBC condom availability	-.09	.08	1.38	.24	-.06	.08	.62	.43	-.04	.08	.30	.59
Injunctive norm condom use	-.18	.09	4.18	.04	-.22*	.09	5.37	.02	-.22	.10	5.28	.02
Descriptive norm condom use	-.17*	.07	6.72	.01	-.18*	.07	6.57	.01	-.18	.07	6.39	.01
Affective attitude condom availability					-.16*	.06	6.40	.01	-.16	.06	5.88	.02
PBC dealing with negative feelings when buying condoms					-.12	.08	2.53	.11	-.11	.07	2.12	.15
Sexual experience									-.53	.22	5.56	.02
Pregnancy experience									.04	.07	.45	.51
Age									.02	.05	.14	.71
Strong intention to use condoms vs. no clear decision about condom use (N = 298 vs. N = 257)												
Actual knowledge condom use	.06	.05	1.06	.30	.06	.06	1.04	.31	.05	.06	.82	.37
Perceived knowledge condom use	.03	.09	.13	.72	.05	.10	.25	.62	.04	.10	.21	.65
Perceived STI risk toward condoms	.31	.09	12.31	.00	.30**	.09	11.39	.00	.30	.09	10.59	.00
Cognitive attitude condom use	-.01	.13	.01	.94	-.01	.14	.01	.93	-.02	.14	.03	.87
Cognitive attitude condom availability	.32	.10	11.09	.00	.30**	.10	9.14	.00	.30	.10	9.42	.00
PBC condom use	.43	.14	9.14	.00	.45**	.14	9.78	.00	.44	.15	9.18	.00
PBC buying condoms	.16	.09	3.16	.08	.16	.09	2.98	.08	.16	.09	2.94	.09
PBC condom availability	.06	.08	.51	.48	.06	.08	.54	.46	.06	.08	.53	.47
Injunctive norm condom use	.14	.09	2.40	.12	.14	.10	2.24	.14	.12	.10	1.51	.22
Descriptive norm condom use	.04	.07	.34	.56	.05	.07	.56	.45	.06	.07	.77	.38
Affective attitude condom availability					-.00	.06	.00	.98	.00	.07	.00	.96
PBC dealing with negative feelings when buying condoms					-.05	.07	.41	.52	-.04	.07	.35	.55
Sexual experience									-.09	.21	.16	.69
Pregnancy experience									-.08	.07	1.16	.28
Age									.04	.06	.55	.46
Pseudo R ²	0.33				0.34				0.34			
Classification accuracy (%)	55.20				57.00				55.60			

Notes. PBC = Perceived Behavioural Control, * P < 0.05, two-tailed; **P < 0.01, two-tailed

^a Model 1 refers to multi-nominal logistic regression with only the sociocognitive variables as predictors

^b Model 2 refers to multi-nominal logistic regression with the sociocognitive variables and additional affective beliefs as predictors

^c Model 3 refers to multi-nominal logistic regression with the sociocognitive variables, additional affective beliefs and demographic, and past behaviour as predictors

condom use if their risk perceptions toward getting infected with an STI were high, had positive cognitive attitudes toward condom availability, and reported higher ratings of perceived behavioral control toward both buying condoms and condom use.

For female participants, the same pattern of findings was found with significant contributions of perceived STI risk ($b = .30$, $SE = .09$, $p < .01$), cognitive attitude toward condom availability ($b = .30$, $SE = .10$, $p < .01$), and perceived behavioral control toward using condoms ($b = .44$, $SE = .15$, $p < .01$). The contribution of perceived behavioral control toward buying was no longer significant ($b = .16$, $SE = .09$, $p = .09$). For male participants, the findings changed, with no significant contributions for perceived STI risk ($b = .06$, $SE = .09$, $p = .53$), cognitive attitude toward

condom availability ($b = .06$, $SE = .10$, $p = .59$), and perceived behavioral control toward buying condoms ($b = .19$, $SE = .10$, $p = .04$). The contribution for perceived behavioral control toward condom use remained significant ($b = .58$, $SE = .16$, $p < .01$). In addition, a significant contribution was found for perceived knowledge about condom use ($b = .27$, $SE = .10$, $p = .01$) indicating that higher perceived knowledge was associated with a higher likelihood of having a strong intention to use condoms.

The multinomial logistic regression across the total sample using sociocognitive, past sexual experience, and demographic variables as predictors showed a classification accuracy of 55.5% (pseudo $R^2 = .33$). For female participants only, the classification accuracy was 55.2% (pseudo $R^2 = .33$); for male participants, 53.8% (pseudo $R^2 = .29$).

Table 3b. Multi-nominal logistic regression with males' intention to use condoms (no intention – no clear decision – strong intention) as outcome measure.

Predictors	Model 1 ^a				Model 2 ^b				Model 3 ^c			
	b	SE	Wald	p	b	SE	Wald	p	b	SE	Wald	p
No intention to use condoms vs. no clear decision about condom use (N = 170 vs. N = 232)												
Actual knowledge condom use	.00	.06	.00	.99	.01	.06	.02	.89	.01	.07	.02	.90
Perceived knowledge condom use	-.04	.11	.11	.74	.00	.11	.00	1.00	.01	.12	.01	.93
Perceived STI risk toward condoms	.00	.10	.00	.97	.00	.10	.00	1.00	-.01	.11	.01	.93
Cognitive attitude condom use	-.22	.16	1.92	.17	-.19	.16	1.48	.23	-.21	.16	1.71	.19
Cognitive attitude condom availability	.05	.11	.23	.63	.09	.11	.68	.41	.10	.12	.77	.38
PBC condom use	-.21	.18	1.39	.24	-.20	.18	1.19	.28	-.21	.18	1.33	.25
PBC buying condoms	.05	.10	.24	.63	.06	.10	.38	.54	.05	.11	.18	.67
PBC condom availability	-.21*	.08	6.42	.01	-.19*	.08	4.97	.03	-.20*	.09	5.61	.02
Injunctive norm condom use	-.30*	.11	7.87	.01	-.32**	.11	8.17	.00	-.31*	.11	7.34	.01
Descriptive norm condom use	.01	.08	.01	.93	-.01	.08	.02	.88	-.03	.08	.11	.74
Affective attitude condom availability					-.27**	.09	11.93	.00	-.27**	.08	11.43	.00
PBC dealing with negative feelings when buying condoms					-.16	.08	3.84	.05	-.15	.08	3.21	.07
Sexual experience									-.45	.23	3.64	.06
Pregnancy experience									.06	.08	.54	.46
Age									.06	.06	1.05	.31
Strong intention to use condoms vs. no clear decision about condom use (N = 328 vs. N = 232)												
Actual knowledge condom use	-.02	.06	.13	.71	-.02	.06	.11	.75	-.03	.06	.18	.67
Perceived knowledge condom use	.24*	.10	6.08	.01	.26*	.10	6.49	.01	.27*	.10	7.07	.01
Perceived STI risk toward condoms	.07	.09	.62	.43	.05	.09	.28	.60	.06	.09	.39	.53
Cognitive attitude condom use	.26	.15	3.03	.08	.27	.15	3.11	.08	.28	.15	3.38	.07
Cognitive attitude condom availability	.06	.10	.40	.53	.07	.10	.49	.49	.06	.10	.29	.59
PBC condom use	.56**	.15	13.24	.00	.55**	.16	12.68	.00	.58**	.16	13.37	.00
PBC buying condoms	.21*	.09	5.49	.02	.22*	.09	5.34	.02	.19*	.10	4.10	.04
PBC condom availability	-.01	.07	.01	.92	-.03	.08	.11	.74	-.03	.08	.11	.74
Injunctive norm condom use	.16	.10	2.63	.11	.18	.10	3.21	.07	.20	.10	3.81	.05
Descriptive norm condom use	.17*	.07	6.45	.01	.15*	.07	5.05	.03	.15*	.07	4.73	.03
Affective attitude condom availability					-.05	.07	.57	.45	-.05	.07	.55	.46
PBC dealing with negative feelings when buying condoms					.04	.07	.30	.59	.04	.07	.31	.58
Sexual experience									.18	.10	.85	.36
Pregnancy experience									-.03	.08	.10	.66
Age									-.06	.05	1.53	.22
Pseudo R ²	0.29				0.31				0.33			
Classification accuracy (%)	53.80				56.50				55.10			

Notes. PBC = Perceived Behavioral Control. * P < 0.05, two-tailed; **P < 0.01, two-tailed

^a Model 1 refers to multi-nominal logistic regression with only the sociocognitive variables as predictors

^b Model 2 refers to multi-nominal logistic regression with the sociocognitive variables and additional affective beliefs as predictors

^c Model 3 refers to multi-nominal logistic regression with the sociocognitive variables, additional affective beliefs and demographic, and past behaviour as predictors

Discussion

Understanding predictors of adolescent condom use intentions is a critical step in the development of interventions aimed at reducing STI transmission and preventing unintended teen pregnancies. This study investigated the antecedents of adolescent intentions to use condoms in the Bolgatanga Municipal area of Ghana, an area where the lack of empirical data on condom use still poses serious challenges to researchers and program planners alike. Bivariate analyses showed that perceived susceptibility towards STIs, perceived behavioral control toward condom use, and the injunctive norm toward condom use were the strongest correlates of condom use intentions among Ghanaian adolescents.

The additional multivariate analyses revealed that having no sexual experience, having negative feelings toward carrying condoms, and not strongly perceiving that peers believe that condom use is always a good idea specifically predicted the intention to not use a condom. In addition, higher risk perceptions, positive attitudes toward condom availability, and higher PBC toward buying condoms, as well as toward condom use, specifically predicted high intentions to use a condom. Overall, our results show that interventions designed to increase condom use in Ghana may not be effective if they fail to target perceived susceptibility toward STIs, injunctive norms, attitudes and feelings toward having condoms available, and perceived behavioral control toward buying and using condoms.

Our findings are consistent with the findings of studies that have been conducted in other parts of

Africa that have shown that confidence and skills regarding condom use are among the most important predictors of the intention to use condoms (Giles et al., 2005; Hendriksen, Audrey, Sung-Jae, Coates, & Rees, 2007; Meekers & Klein, 2002; Taffa, Klepp, Sundby, & Bjune, 2002). In a review of behavioral interventions designed to reduce the incidence of HIV, STDs, and pregnancy among adolescents, Robin and colleagues (2004) reported that skill-building activities (including negotiation skills, communication skills, problem-solving skills and decision-making skills that increase behavioral control toward condom use) were all crucial to program effectiveness and success. Other methods used to increase self-efficacy and behavioral control—such as guided practice and enactive mastery experience—have been developed (Bartholomew et al., 2011, pp. 342–344). Enactive mastery experience refers to the successful performance of the target behavior, which should enhance perception of efficacy, while failure to perform the behavior should undermine it (Bandura, 1988). A recent review of the best way to increase self-efficacy in order to promote lifestyle and recreational physical activities found that interventions that included enactive mastery experiences, as well as feedback on past performance or the performance of others, produced the highest levels of self-efficacy (Ashford, Edmunds, & French, 2010).

In order for people to be motivated to change their behavior, they must first acknowledge their own personal risk in terms of the specific threat (Floyd, Prentice-Dunn, & Rogers, 2000). Although there is an ongoing debate about the importance of risk perception in motivating safe sex practices (*see* Brewer et al. 2007; Sheeran & Taylor, 1999), our study clearly shows that perceived risk is strongly related to condom use intentions. Caution should be exercised when using fear-related messages to influence risk perceptions (Mevissen, Ruiter, Meertens, & Schaalma, 2010; Peters, Ruiter, & Kok, 2013). However, various effective theory-based methods, such as the use of personalized risk information or scenario-based risk information to target STI-related risk perceptions, can be found in the scientific literature (DiClemente, et al., 2008; Mevissen et al., 2010; Mevissen, Meertens, Ruiter, Zimbile, & Schaalma, 2011). For a review of additional methods and practical applications that can be employed to increase PBC and raise the awareness of risk toward behavior change, see Bartholomew et al. (2011, pp. 325–377).

That cognitive as well as affective attitudes toward condom availability strongly predicted condom use intentions in our study is perhaps not surprising, in light of available evidence regarding the influence of attitudes on human behavior. However, the finding is contrary to the argument that cognitive attitudes, as a subject of value clarifications, are less developed in adolescence and, would, therefore, have a limited role in explaining young people's sexual behavior (Ajzen, 2001). The stronger predictive role of cognitive attitude as compared with affective attitude toward condom availability is in contrast to our expectation; because discussing sex in a culturally inhibited environment, such as Northern Ghana, can elicit strong emotional responses from adolescents, we expected affective beliefs to predict condom use intentions more strongly than cognitive beliefs. However, we interpret this contrast with caution because the affective attitude construct contained only one item in its scale. Future research should explore the role of affective attitudes on adolescent intentions toward condom use in Ghana.

In addition, these results show that feeling comfortable with carrying condoms and finding it important to have them available are important prerequisites for condom use. The importance of condom availability makes it clear that initiatives attempting to increase condom use may have a good chance of success if they explain how to obtain condoms from public stores and how to carry them around without feeling embarrassed. Efforts to make condom displays visible and easy to approach in local stores or health facilities, or supplying free condoms in relatively anonymous places such as washrooms, may help to overcome such barriers. Initiatives such as placing free condoms in washrooms have been shown to increase the number of condoms acquired, carried, and used by individuals showing high-risk sexual behavior (Moore, Dahl, Gorn, & Weinberg, 2006). However, given the strong religious and negative sociocultural beliefs about premarital sexuality in Northern Ghana (Takyi, 2003), further research is necessary to determine the feasibility of such initiatives.

With regard to normative influences on intention, the reason for the relatively weak predictive value of descriptive norms compared to injunctive norms is unclear. The results of research carried out thus far are not consistent; while some studies are reporting medium to strong relationships (Rivis & Sheeran,

2003), others obtained similarly weak associations (Rimal & Real, 2003). From a theoretical perspective, we expected descriptive norms to predict intentions more strongly because of evidence suggesting that adolescents are more susceptible to social influence than adults (Clark & Lohéac, 2007; Steinberg & Monahan, 2007). Adolescents are, therefore, particularly susceptible to peer pressure and more likely to conform to pressures related to both real and perceived social norms, as they tend to model peer behaviors in order to gain group recognition (Kiesner, Cadinu, Poulin, & Bucci, 2002; Lapinski & Rimal, 2005; Newman & Newman, 2001; Pedlow & Carey, 2004). In essence, descriptive norms should weakly correlate with intentions to use condoms only if the sample is from a population of people who do not define themselves in terms of the group norm. However, this was not the case in our sample—a population in which interpersonal relationships and ties are strongly embedded in the social system and determine the norm (Acquaah, 2007). Future research should, therefore, use more rigorous measures of social norms to explore the associations between descriptive norms, group identification, and condom use intentions in order to arrive at a more definite conclusion. However, from the mean scores of the two norm constructs, it is clear that the students expect their peers to be positive about condoms (injunctive norm) but not to use them (descriptive norm). This inference is consistent with what is expected from adolescents in Ghana (Awusabo-Asare, Biddlecom, Kumi-Kyereme, & Patterson, 2006), and it might explain the low correlation between the two constructs of perceived social norms.

In line with existing evidence (Berten & Van Rossem, 2009), both perceived and actual knowledge subscales correlated weakly with condom use intentions and failed to contribute in the regression equation. This finding further confirms the view that simply disseminating information about HIV/STIs or teenage pregnancies, as is current practice in Africa, will not induce condom use intentions. Instead, intervention planners should focus on variables such as PBC, risk perception, and attitude.

The finding that participants without sex experience have no intention of using condoms confirms the findings of previous studies, which showed that young people with no sex experience (and, therefore, no condom use experience) in the past are unlikely to intend

to use condoms in the future (Hendriksen et al., 2007; Sheeran & Taylor, 1999). These findings could be of interest to intervention planners involved in promoting condom use as they suggest that young people may be using their past behavior as a guide to their future plans regarding condom use, rather than basing their intentions on attitudes and subjective norms.

From the regression equation, our findings show that cognitive and affective psychosocial constructs can, in part, explain the prerequisites for increasing intentions to use condoms among West African adolescents, a finding consistent with other studies conducted in Africa (Giles et al., 2005; Schaalma et al., 2009; Sheeran & Taylor, 1999). Schaalma and colleagues (2009) also included geographic, socioeconomic, and condom access factors as predictors of condom use in their study among adolescents in Uganda, which resulted in a high level of explained variance. Such environmental factors are especially important in intervention contexts where few resources are available. As reported by MacPhail and Campbell, (2001), contextual factors that determine young people's condom use behaviors in Africa include negative and unsupportive adult attitudes to youth sexuality: restricted availability of condoms, the broader social issues related to the social construction of gender, and the economic constraints that young people face. Future research should take into account environmental determinants in order to clarify the contextual factors that can explain adolescent sexual behaviors in northern Ghana.

Our results also suggest that factors influencing condom use intentions are slightly different for adolescent girls and boys, which is in line with previous findings (Boer & Mashamba, 2007; Pearson, 2006). Future intervention planners should examine ways to address gender differences within program components.

The present study also has some limitations. First, that adolescents may not provide honest responses to questions about sensitive topics is possible (Mensch, Hewett, & Erulkar, 2003; Plummer et al., 2004). However, we do think the procedure we used in collecting the data (separate seats, anonymous data collection) maximized our chances of receiving honest responses from the students. Second, we used a cross-sectional design and, therefore, the *effects* of the psychosocial measures on the intention measure are not necessarily causal (Fishbein & Yzer, 2003). Third, the

generalizability of our findings may also be limited by the relatively low alphas of the scales and by the fact that some scales only contained one item. Furthermore, because of the high stigma associated with homosexuality in the region where the study was conducted (AED, 2008), our measures of sexual experience were limited to questions regarding heterosexual intercourse. Finally, although the students in our study did not have difficulty giving their ages, whether the ages provided were accurate, we are unable to tell. Validity checks are also difficult; if some individuals do not know their exact age, it is likely that their parents will not know it either.

Aside from these limitations, the overall results show that psychosocial variables with regard to perceived risk, attitude, social norms, and behavioral control can explain the intention to use condoms among adolescents living in the Bolgatanga municipal area in northern Ghana. For the purposes of intervention planning, we recommend providing a comprehensive sex education program to adolescents with an emphasis on enhancing perceived behavioral control, addressing negative attitudes and feelings toward carrying condoms, and raising perception of risk/susceptibility to STIs. The results from the present study suggest that these measures will increase behavioral intentions that should, in turn, facilitate the likelihood of actual condom use.

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