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I would like to thank Chastity Blankenship, PhD., for giving me both the autonomy to design this research, and the knowledge to execute it.

Condom Use for the Prevention of STIs among College Students Who Do Not Rely on Condoms as Their Primary Form of Contraception

Amy K. Rooker
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Contraception is a primary concern for many sexually active adolescents and adults who are not prepared or wanting to assume the role of a parent. “Safe sex” is not only sex without the risk of pregnancy; it is also safeguarding against sexually transmitted infections (STIs). If used correctly: contraceptive pills, IUDs, vaginal rings, patches, injections, and even natural family planning are proven effective at preventing pregnancy (Guttmacher Institute, 2015). However, the male and female condoms are the only contraception methods that also prevent the spread of STIs (Guttmacher Institute, 2015). That said, for sex to be “safe,” a condom must be employed. But, when the risk of pregnancy is removed, the notion of “safe sex” is sometimes forgotten.

Increased STI rates among senior citizens who are not at risk for pregnancy provided the basis for this research. Consider nursing homes and retirement communities, where much of the aging female population is post-menopausal and their childbearing years are behind them. With no risk of pregnancy, the use of condoms is often deemed unnecessary, causing STI rates to skyrocket among the population (Emanuel, 2014). In 2011 and 2012, STI screenings were as popular of a procedure as colonoscopies among Medicare beneficiaries (Emanuel, 2014). To put that more into perspective: among Americans age 65 and older, incidences of chlamydia increased by 31 percent and syphilis by 52 percent between 2007 and 2011, a rate that barely falls short of the 35 percent increase in chlamydia and 64 percent increase in syphilis infections among 20 to 24 year olds (Emanuel, 2014). These rates are unsurprising considering that seniors are less likely to use condoms than young adults. The 2010 National Survey of Sexual Health and Behavior reports that college-age Americans use condoms 40 percent of the time, whereas Americans age 61 and older use a condom on average only 6 percent of the time (Emanuel, 2014).

The population of seniors can be likened to co-eds on a college campus—do college students that do not fear the risk of pregnancy have similar usage rates (or lack thereof) of contraceptives that protect against STIs? More specifically, the aim of this research was to determine how likely one was to use a condom to protect themselves against STIs during a sexual encounter when the female partner uses a non-barrier method (e.g., pill, IUD, etc.) as her primary form of contraception. If trends were consistent among age groups, partners using a primary form of contraception would be less likely to use a condom during sex. The factors affecting condom use, both with and without a primary form of contraceptive, are

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discussed, as well as contraception and STI rates.

Literature Review

According to The Centers for Disease Control and Prevention (CDC), the eight most common STIs include: chlamydia, gonorrhea, hepatitis B virus (HBV), herpes simplex virus type 2 (HSV-2), human immunodeficiency virus (HIV), human papillomavirus (HPV), syphilis, and trichomoniasis (CDC, 2013). HPV is the most prevalent STI, with approximately 14.1 million new cases annually, 49 percent of which are among people ages 15-24 (CDC, 2013). Young adults ages 20-24 contract chlamydia and gonorrhea more frequently than people of any other age. For both men and women aged 20-24, there were 2,574.9 chlamydia cases per 100,000. For gonorrhea, females aged 20-14 observed 546.9 cases per 100,000 and males observed 539.1 cases per 100,000 (CDC, 2016). Potentially some of the increase in STIs could be due to a decrease in the stigma of having sex and an increase in the availability of birth control options, which reduces the fear of pregnancy.

Now more than ever women are taking advantage of highly reliable forms of contraception; four of every five sexually active women, regardless of age, has used an oral contraceptive pill (Guttmacher Institute, 2015). Another common form of birth control, the male condom, is relied upon by approximately 5.7 million women (Guttmacher Institute, 2015). Despite being the only woman-controlled mode of contraception that safeguards against pregnancy and STIs, the female condom has relatively low usage rates. Cost is one contributing factor; female condoms cost on average two to four dollars each versus 0.50 cents to two dollars on average for male condoms (Diep, 2015). Difficulty with insertion and failure of sexual education curricula to discuss female condoms has also stifled their rise in popularity (Hoffman, Mantell, Exner & Stein, 2004; Pemberton, 2014).

In women who do not rely on an oral contraceptive, IUD, patch, vaginal ring, implant or injection as their primary method of contraception, the trend appears to continue; women are less likely to use condoms as a secondary

form of contraception or to prevent transmission of STIs. Women who took the pill regularly and did not miss doses were less likely to use condoms as a dual-method of protection (Weisman, Plichta, Nathanson, Ensminger, & Robinson, 1991; Safeek & McKellar, 2013). In fact, few women use a dual method to protect against pregnancy and infection. Eight percent of woman of reproductive age used two or more forms of contraception (Guttmacher Institute, 2015; Safeek & McKellar, 2013). Consistency and reliability of the primary form of contraception corresponded to inversely proportional rates of condom use (Eisenberg, Allsworth, Zhao, & Peipert, 2012). The most concern is with women using the most reliable long acting reversible contraceptives (LARC) (i.e., IUD) because they are at the least risk for pregnancy, and only 1.9 percent reported using a condom at last sex (Eisenberg, Allsworth, Zhao, & Peipert, 2012). It is alarming that only 8 percent used dual methods when the CDC reports that there are 20 million new STI incidents annually (CDC, 2013).

Males are more likely than females to have used a condom at last sex. Among adolescents, being female and older corresponded to more unprotected sex within the past 90 days (Project Shield Study Group, 2008). In the same sample, regardless of sex, 63 percent did not use a condom at last sex, and 26% had not used a condom at all within the past 90 days (Project Shield Study Group, 2008). Research from 1999 found that in a national sample, 57 percent of males ages 15 to 19 years old used condoms, 39 percent of males ages 20 to 24 years old used condoms; for females only 37 percent of 15 to 19 year olds, and 26 percent of 20 to 24 year olds used condoms (Hanna, 1999). As a part of a different study, researchers found that 52.2 percent of males had used condoms during vaginal intercourse compared to 39.7 percent of female respondents (Myers & Clement, 1994). The males also reported higher rates of condom use for anal intercourse: 4.8 percent versus 0.8 percent (Myers & Clement, 1994). Regardless of sex, 63.8 percent reported having unprotected sex at least once within the past 90 days; only 15.2 percent used a condom every time (Myers

& Clement, 1994).

The best predictors of condom use are: perception of pleasure lost by using condoms, perceived partner disapproval of condoms, and partner communication (Project Shield Study Group, 2008). In the Myers and Clement study, males and females were surveyed on their attitudes toward condoms. Participants were prompted with statements like: “condoms were a turnoff,” “safer sex is boring,” “it is hard to have safer sex if using drugs or alcohol just prior to or during sex,” and “it is hard to have safer sex with a very attractive person,” (Myers & Clement, 1994). Females were more likely than males to disagree with all of the previous statements, and overall females had a more positive attitude toward condom use (Myers & Clement, 1994). The men rated sexual enjoyment as a more important factor in not using condoms than females (Myers & Clement, 1994).

As stated above, females show more positive attitudes toward condoms. The theory of self-efficacy says that a more positive attitude increases condom self-efficacy and should therefore correspond with increased condom use. However, this is not the case. Males are more likely than females to have used a condom at last sex. The problem is that despite their favor for condoms, if the male partner does not prompt condom use, then she must break feminine norms and bring up the discussion to use condoms (Myers & Clement, 1994). In the study, females were more likely than males to indicate that they could not discuss condom use as their reason for having unprotected sex (Myers & Clement, 1994).

Beyond pleasure and having the assertiveness to discuss safe sex, other factors have been found to have a complex relationship with condom use. Among sexually active adolescents who had received HIV education, the fear of contracting HIV was not found to be a significant factor when determining condom use (Brown, Diclemente, & Park, 1992). What may be surprising, however, is that fear of HIV was a significant factor in the adolescents' intentions to be sexually abstinent, despite not affecting the opinions of those who were already sexually active (Brown, Diclemente, & Park, 1992). Of

the respondents in the Myers and Clement study, 87.4 percent felt that they had little to no chance of contracting HIV/AIDS (Myers & Clement, 1994). This notion is not unique to Myers and Clement. Now though, thanks to advances in pharmacology, HAAS (highly active antiretroviral therapy) combination drugs have turned HIV into a manageable chronic condition. A recent study out of London reported that in 2012 less than one percent of the population living with HIV died from HIV-related causes (Pemberton, 2014). Because HIV no longer poses the threat that it once did, fear of contracting the disease has declined in recent generations, lowering rates of condom usage with it.

Despite the decrease in perceived risk of contracting an STI, once an infection has been contracted the perceived stigma has not decreased with it. For both men and women, higher perceived STI-related stigma lowers the odds that an adolescent will be tested (Cunningham, Kerrigan, Jennings, & Ellen, 2009). This is a dangerous set of circumstances. Adolescents who do not use condoms are more likely to become infected, but stigma often prevents them from being screened and treated if an infection has occurred. Chlamydia, syphilis, and trichomoniasis are easily treated if caught early, but if left untreated they can lead to infertility (Cunningham, Kerrigan, Jennings, & Ellen, 2009). In addition to infertility, HPV, the most frequently diagnosed STI can potentially lead to cervical cancer (Cunningham, Kerrigan, Jennings, & Ellen, 2009).

Murray and Miller also called anxiety of STIs into question in their research. Students at Rocky Mountain College were enrolled in an introductory health course (IHC). There was a statistically significant increase in condom usage to prevent unwanted pregnancy after the IHC, but there was no significant increase in condom usage to protect against STIs (Murray & Miller, 2000). The conclusion is that students are more concerned with condoms for their contraceptive benefits than their benefits as a barrier against infection.

To expand on the existing literature on factors that influence the use of dual contraceptive use to protect against STIs we surveyed

students at a small, private, liberal arts college. Based on previous research, we hypothesized partners who are not relying on condoms as their primary form of contraception would observe lower rates of condom use and efficacy than partners relying on condoms as their principle method to prevent pregnancy.

Methods

Research was conducted on a sample of students at a small, private liberal arts school in Lakeland, Florida. Data collection was achieved via self-administered surveys in April 2016. Surveys were distributed to students in social science classes, athletes, members of Greek life, and students with varying majors and interests. Students who elected to participate in the IRB approved study remained anonymous and signed an IRB approved consent form.

In the beginning of the survey, students were prompted with several demographics to identify with, including: sex (male/female), age, race, year in school, major in school, and religious identification. Next students were asked whether or not they had ever been sexually active (including but not limited to oral, vaginal and/or anal sex). Participants who had never been sexually active were then prompted to end their participation in the survey. If the participant was sexually active and female, she also answered whether or not she was currently using a prescription non-barrier contraceptive (oral contraceptive pill, intrauterine device (IUD), vaginal ring, implant or patch).

The bulk of the survey consisted of closed-ended questions. If the subject was a female non-barrier contraceptive user, she first answered a closed-ended question to determine which type of contraception she was using. Other questions gauged the participants' sexual health behaviors. For example, "Did you use a condom at last sex?" and "Have you ever been tested for STIs?" If the student had been tested, they answered whether or not they were tested as part of a routine physical or if they sought out testing.

An ordinal scale asked students to rate what was most important to them, with seven being most important to zero being not important

at all. This included but was not limited to, "family," "career," and "religion/faith." For Likert scale questions students were asked to agree or disagree with several prompts that measure attitudes toward condom use and STIs. Contraception questions included, "I would not have sex without a condom," "I would not use a condom if the female partner was on an oral contraceptive pill," and "Condoms make sex less pleasurable." Example STI-focused questions included, "I discuss my sexual health with every new partner before engaging in sexual activity," and "I should get tested between every partner." Literature reports that fear of contracting an STI does not significantly influence condom use. If this trend held true for this research, it would support the hypotheses.

After data collection was completed, relationships between demographics, independent, and dependent variables were explored. Chi-square tests were run to determine statistically significant relationships among independent and dependent variables.

Results

A total of 203 students participated in the study; 73.4% were currently or had ever been sexually active. Of the sexually active respondents, 60.8% were female, and among these women, 65.6% were currently using a prescription non-barrier contraceptive. For both male and female sexually active respondents, 12.8% had never had sex without a condom and 48.3% used a condom the last time they had sex. The type of prescription non-barrier contraceptive was not a significant determinant for further analyses. Of the 66 women prescribed a non-barrier contraceptive, only eight (3.9%) used a method other than an oral contraceptive pill. Additional demographic information about the sample is available in Table 1.

In accordance with the literature, we hypothesized that partners who are not relying on condoms as their primary form of contraception would observe lower rates of condom use and efficacy than partners relying on condoms as their principle method to prevent pregnancy. However, a Pearson chi-square test found no statistically significant relationship between

Table 1: Demographic Variables

Variables	<i>n</i>	Percentage	Mean
Age			19.8
Gender			
Male	59	29.1	
Female	92	45.3	
Race			
White	168	82.8	
Non-White	33	16.3	
Sexually active			
Yes	149	73.4	
No	49	24.1	
Contraceptive user			
Yes	46	44.2	
No	1	1.0	
Received comprehensive sex education			
Strongly disagree	15	7.4	
Disagree	25	12.3	
Neutral	34	16.7	
Agree	85	41.9	
Strongly agree	43	21.2	
It is difficult to ask partner to use condoms			
Strongly disagree	60	29.6	
Disagree	56	27.6	
Neutral	18	8.9	
Agree	8	3.9	
Strongly agree	2	1.0	
Has ever had sex without a condom			
Yes	129	63.5	
No	19	9.4	
Used condom at last sex			
Yes	71	35.0	
No	75	36.9	

contraception users and using a condom at last sex. Despite this finding there was a significant relationship between respondent's gender having sex without a condom if you or your partner was using a prescription non-barrier contraceptive, $X^2(5, N = 143) = 11.29, p = .046$. Of the 86 women who responded, the majority agreed that they would not use condoms if they were on a prescription non-barrier contraceptive. Of the 57 men who responded, the majority either agreed or were neutral.

The Project Shield Study Group (2008) found that the best predictors of condom use were perception of pleasure lost by using condoms, perceived partner disapproval of condoms, and partner communication.—The Pearson chi-square test results in Table 2 confirm that the relationship between perceived partner disapproval of condoms and condom use at last sex was significant, $X^2(10, N = 143) = 28.62, p = .001$. Of the 34 respondents who strongly agreed that their partner would prefer to have sex without a condom, 27 did not use a condom at last sex.

Myers and Clement (1994) stated that women found it more difficult to prompt condom use; however, there was no significant relationship between gender and difficulty asking your partner to use condoms in our data. Partner communication about using condoms is significant and so is communication about your sexual health. The Pearson chi-square test for using a condom at last sex with discussing your sexual health with each new partner before sex confirmed that there was a significant relationship between the two variables, $X^2(10, N = 143) = 39.18, p = .000$. Of the 143 students

who responded, 15 who strongly agreed that they discuss their sexual health with each new partner had not used a condom the last time they had sex, whereas five who strongly agreed did use a condom the last time they had sex. Among the sexually active respondents, 75.3% of females told their last partner if they were using a prescription non-barrier contraceptive before engaging in sex, and 71.4% of male respondents knew whether or not their last partner was using a contraceptive. In addition to perception of your partner's preference to use condoms, partner communication was also a significant predictor of condom use for this data. Our chi-square results between difficulty asking your partner to use condoms and condom use at last sex were significant, $X^2(10, N = 142) = 143.61, p = .000$. There were 60 respondents out of 142 that stated it was not difficult to talk to their partner who also did not use a condom.

A Pearson chi-square test also found a statistically significant relationship between the respondent's relationship to their last partner and condom use at last sex, $X^2(8, N = 147) = 40.82, p = .000$. Of 147 respondents, 75 did not use a condom the last time they had sex. Of those 75, 36 were in a long-term relationship, 27 were exclusive with their partner but had not been dating for more than a year, 11 were non-exclusive with their last partner, and one did not respond.

Literature suggests that perceived risk of pregnancy affects frequency of condom usage, whereas perceived risk of STIs is not a significant factor. For this data, pregnancy was a significant factor; the Pearson chi-square results for how often do you use condoms with feeling at risk

Table 2: Results of Pearson Chi-Square Test for "Did you use a condom the last time you had sex?" with "I think my partner would prefer to have sex without a condom."

Used a Condom at Last Sex	My Partner Would Prefer To Have Sex without a Condom				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Yes	3 (60.0%)	8 (53.3%)	16 (61.5%)	26 (50.0%)	7 (20.6%)
No	2 (40.0%)	7 (46.7%)	10 (38.5%)	26 (50.0%)	27 (79.5%)

Note. $X^2(10, N = 143) = 28.62, p = .001$. Percentages reflect column percentages.

of pregnancy was $X^2(25, N = 147) = 52.95, p = .001$. Additionally, contrary to the literature, risk of STIs was found to be a significant factor in the decision to use condoms, $X^2(25, N = 147) = 50.06, p = .002$. Even though feeling at risk of contracting an STI had a significant relationship with frequency of condom use, 41.7% of sexually active respondents had ever been tested for STIs, and six had ever been diagnosed with an STI. Despite 38.5% of respondents agreeing that they should be tested for STIs between each partner, less than half of the students who had ever been tested sought out testing on their own rather than being tested as a part of a routine physical or appointment. Pearson chi-square results comparing condom use at last sex to both receiving STI curriculum and HIV/AIDS curriculum were not statistically significant. Condom use at last sex and ever having been diagnosed with an STI also showed no significance; of the six respondents who had previously contracted an STI, three used a condom at last sex and three did not.

Moving beyond bivariate data analysis, a logistic regression equation was calculated, this time predicting the use of a condom at last sex based on gender, length of relationship with last partner, and thinking your partner would prefer not to use condoms. This regression model was significant and explained 15% of the variance. Respondents who were in a long-term relationship (lasting longer than 1 year) with their last partner were 3.197 times more likely to not have used a condom the last time they had sex than all

other respondents.

A second logistic regression equation was calculated to predict condom use at last sex based the following variables: thinking it is difficult to ask your partner to use condoms, thinking your partner would prefer to have sex without a condom, and thinking condoms make sex less pleasurable. The current regression model was statistically significant and able to explain 21% of the variance. Respondents who thought that condoms make sex less pleasurable were 3.240 times more likely to have not used a condom the last time they had sex than all other respondents. Our logistic regression results are displayed in Table 3.

Discussion

Throughout this endeavor, sexual health behaviors and predictors of condom usage among sexually active college students were investigated. Specifically in question was the likelihood of partners who were using a prescription non-barrier method of contraception to also use condoms as a dual method of protection.

A major limitation in this study was the sample size. There were 203 responses recorded, and only 149 participants were sexually active and therefore allowed to contribute to the bulk of the data analysis. A larger sample size would increase variation among responses. More variation has the potential to compel some models, which are consistently significant in the literature, to also become significant in this study.

Table 3: Logistic Regression Results: Effects of the Common Barriers to Condom Use on the Use of a Condom at Last Sex

Independent Variable	b	β	SE
It is difficult to ask my partner to use condoms	-1.215	.297	.672
Partner would prefer not to use condoms	.995	2.703	.735
Condoms make sex less pleasurable	1.176	3.240*	.595
Constant	-.769	.463	.578
N	74		
Chi-square	2.536**		
Nagelkerke R ²	.212		

Note: *p < .05 **p < .01

In this study, it was hypothesized that respondents who were using a prescription non-barrier contraceptive would be less likely to use condoms than all other respondents. Contrary to what literature had led us to believe, a significant relationship between contraceptive users and condom use at last sex did not exist. A larger sample size could help this model reach significance, but another issue is that only women were included in this calculation. Men are asked if they knew whether or not their partner was on a prescription non-barrier contraceptive, but there was not a question asking men if their partner was or was not using a contraceptive. Another limitation was the failure to explicitly list injections as a form of contraception when asking participants if they were currently using prescription non-barrier contraception. These were limitations and flaws of the survey, and any further research done into this topic should make necessary changes.

Perception of pleasure lost by using condoms, perceived partner disapproval of condoms, and partner communication were found to be three of the best predictors of condom use, which is consistent with the literature. Condom usage based on the perception that condoms makes sex less pleasurable was significant when calculated in a logistic regression model against thinking your partner would prefer to have sex without a condom, and thinking it is difficult to ask your partner to use condoms. Respondents who thought their partner would prefer to have sex without a condom were less likely to have used a condom the last time they had sex. The literature suggests people who find it difficult to talk to their partner about condoms are less likely to use them. However, respondents who did not feel it was difficult to ask their partner to use condoms were less likely to have used a condom at last sex. The data also went against the literature convention in that there was no significant relationship between gender and difficulty asking your partner to use condoms.

A possible explanation for the relationships among perception of pleasure lost by using condoms, perceived partner disapproval of condoms, and partner communication is the length of the respondent's relationship with their

last partner. The majority of respondents in our sample were in long-term relationships lasting more than one year. There is an assumed level of trust and comfort in a long-term relationship that one could assume would make it easy to talk to your partner about using condoms. In long-term relationships, you may also be more receptive and accommodating to your partner's preferences to not use condoms. A long-term relationship was the only significant variable in the logistic regression model comparing condom use at last sex with gender, long-term relationships, and partner's preference not to use condoms. Partners in long-term relationships may also be less likely to use condoms because they are stable enough and comfortable enough in their relationship to deal with the consequences of an unintended pregnancy.

Risk of pregnancy and risk of contracting an STI were significant factors on frequency of condom use. The majority of respondents who did not feel at risk of pregnancy or an STI used condoms most of the time. This is good news; the literature does not report fear of contracting an STI as a significant factor in determining condom use. Despite this result, data on STI testing rates is consistent with the literature. Respondents agree that they should be tested between partners, but less than half of all sexually active respondents had ever been tested for STIs. Even fewer had chosen to be tested on their own.

At the conception of this study, the ultimate goal was to determine the likelihood of college students who do not rely on condoms as their primary form of contraception to use condoms to protect themselves against STIs. Now, at what is hopefully not the end of this project, the ultimate goal is to educate and promote sexual health. As aforementioned, further investigation should include whether or not a man's last partner was using a prescription non-barrier contraceptive. Future recommendations include increasing the sample size, and possibly surveying other schools, preferably, middle to large-sized liberal arts colleges for comparisons reasons. Also, recommended is further exploration or investigation into the effect of middle and/or high school sex education curriculum

on sexual behaviors on young adults, if at all. In conclusion, understanding how sexual education determines sexual practices later in life is the best way to set future generations up for the highest quality of sexual health.

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