

A pilot test of a self-guided, home-based intervention to improve condom-related sexual experiences, attitudes, and behaviors among young women

Abstract

Objective: To conduct a pilot test of a brief, self-guided, home-based program

5 designed to improve male condom use attitudes and behaviors among young women.

Participants: Women aged 18-24 years from a large Midwestern University reporting

having had penile-vaginal sex with two or more partners in the past 3 months. Sixty-seven enrolled; 91.0% completed the study.

Methods: A repeated measures design was used, with assessments occurring at baseline,

10 immediately post-intervention (T2), and 30 days subsequent (T3).

Results: Condom use errors and problems decreased, condom-related attitudes and

self-efficacy improved, and experiences of condom-protected sex were rated more

positively when comparing baseline with T2 and T3 scores. Further, the proportion of

condom-protected episodes more than doubled between T1 and T3 for those

15 in the lowest quartile for condom use at baseline.

Conclusion: This low-resource, home-based program improved condom-related attitudes and

promoted the correct and consistent use of condoms.

Introduction

Historically, condom promotion interventions have focused on men due to the assumption that, generally, men control male condom use. **Such interventions for women, however, have focused on gender power dynamics, female negotiation or insistence on condom use, and female motivations that may interfere with condom use. These motivations include the desire to please a male to experience intimacy, to express love, to avoid relational discord, to become pregnancy, or to resolve economic issues.**¹⁻⁷ However, studies show that women often apply condoms to their male partners⁸ and report errors and problems that compromise condom effectiveness.⁹ Women's agency in determining when and how male condoms are used may be underestimated.¹⁰⁻¹³ **Condom promotion programs that focus on women's desire to be involved in condom use decisions are needed.**

One potential barrier to correct and consistent condom use is negative experiences with male condoms for either partner, although most research has focused on men. Studies have indicated that male condoms may lead to discomfort and reduced sensation for female partners.^{1, 14-20} Problems with condoms drying out during intercourse can cause vaginal irritation or pain^{18,21,24} and decrease women's sexual arousal.

Women who report discomfort, less sensation and sexual arousal, and condoms drying out, for example are less likely to use condoms consistently.^{25,26} In a cross-sectional study, arousal loss related to condom use was more strongly associated with subsequent unprotected sex among women than men.²⁷ In a nationally representative sample of U.S. youth, lack of condom use was more closely associated with beliefs that condom use during sex would lead to less physical pleasure than socio-demographic and sexual history factors.²⁸ Educating women as well as men about ways to

enhance condom use experiences could be an important public health strategy, yet few interventions to date have focused on this approach.

Clearly, some of the reasons for not using condoms among women differ from those of men.¹⁵ Although the direct determinants of condom use (e.g., attitudes and efficacy) are likely to be similar, condom use skills and experience (e.g., problems, comfort, negotiation, application) can vary. The present study adapted and tested, in women, a novel home-based intervention originally designed for men, *The Kinsey Institute® Homework Intervention Strategy (KI-HIS)*. *KI-HIS* is a brief behaviour change condom promotion intervention, developed to improve condom use skills, enjoyment and self-efficacy among young men. The program has three elements: self-practice of condom use in a “no pressure” situation; experimenting with different brands of condoms and lubricants (C&L) relative to fit and feel; and encouragement to focus on the physical sensations while using condoms. *KI-HIS* demonstrated evidence of efficacy in studies in the U.S., U.K., and Canada,²⁹⁻³¹ men reported more positive condom use experience, greater lubricant use, and fewer condom use errors and problems.

Based on the experience with KI-HIS, the Kinsey Institute Condom Use Research Team (CURT) developed a similar intervention for women called the *Kinsey Institute Home-based Exercises for Responsible Sex (KI-HERS)*, for which this study served as a pilot trial. The primary tenet of this intervention is that women’s use of C&L is influenced by their condom use attitudes, experience, and self-efficacy. The aim of *KI-HERS* is to improve women’s experience with condoms and their ability to use C&L as part of mutually pleasurable and safe sexual activity. Drawing on the sex therapy approach,³² women are assigned behavioural exercises (“directed practice”) designed to increase their focus on pleasurable sensations while using C&L. Following a single orientation education/training

session, home-based exercises encourage women to actively experiment with C&L to increase condom use skills and self-efficacy and increase positive attitudes towards condoms through repeated exposure, rehearsal, and a focus on positive sensations. Women are asked to try various C&Ls on their own to identify which best suit their needs and maximize pleasure.

- 5 The primary research questions involved determining whether the intervention:
- (1) increased condom-use self-efficacy; (2) reduced embarrassment related to condom negotiation and use; (3) reduced pleasure-related barriers and improved pleasure-related attitudes towards condom use; (4) enhanced arousal, pleasure, and orgasm during condom use; (5) increased condom use during penile-vaginal (PVI) and penile-anal intercourse (PAI); and (6) reduced condom use errors and problems. Additionally, women were asked about their overall perceptions of the intervention and suggestions for improvement.

Methods

Study design

15 This study used a repeated-measures design with 2 follow-up assessments. Following a baseline questionnaire and training session with a research assistant (RA) (T1), participants completed a 21-day intervention period. An immediate post-intervention questionnaire and a follow-up interview with the RA were completed (T2). A final assessment (T3) occurred approximately 30 days after T2. Questionnaires were administered online using Qualtrics (Provo, Utah).

20 Sample recruitment and eligibility

Women were recruited from a large, public Midwestern university using flyers posted on the university campus, print and online advertisements, and in selected classes. Eligibility criteria were:

(1) being a woman between 18-29 years old; (2) enrolled at the university; (3) having had two or more PVI partners in the last three months; and (4) having used a male condom at least once in the last two months. Women with sensitivities and allergies to latex and those who were pregnant were ineligible. Data were collected from October 2016 through March 2017.

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Study procedures and intervention

Following a website link on the recruitment flyer, women interested in participating completed a screening questionnaire and if eligible, provided their email address. RAs made final determinations of eligibility and contacted women by e-mail to arrange a face-to-face training session. At the beginning of the session women were given a study information sheet, provided written informed consent, and then completed the online T1 baseline questionnaire. The institution's internal review board approved all study procedures.

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T1 assessed participants' sexual history and male condom use-related attitudes, experiences, and behaviors. They received a checklist to guide them through the process of completing each step of the program and a kit containing 7 condoms of different sizes and textures, 3 different lubricants (2 water- and 1 silicone-based), a dildo, a homework instruction card, instructions on applying condoms, and condom use diary forms. The dildo was a standard size rubber model with a small base.

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Women were instructed to practice using at least five different condoms on their own and, if they desired, three different lubricants over the home-based intervention period. They were asked to focus on fit, feel, and pleasure and to discover what type of C&L they liked best to maximize sexual pleasure. The homework activity comprised 5 steps: (1) open condom package and remove condom; how does it feel?; (2) touch the condom to your genitals; how does that feel?; (3) open the lube

package, rub between fingers; (4) put condom on your fingers or sex toy and insert into vagina; and (5) put condom on fingers or sex toy and commence self-pleasuring. Women were instructed to complete a Condom Use Diary Form after each practice session with each condom, asking if they had completed the above 5 steps and providing a 5-point scale (“extremely” to “not at all”) to rate their level of pleasure in using each of these condoms.

RAs sent email reminders during the intervention period; at the end of this, the RA emailed participants to arrange a meeting (T2) to complete the same questionnaires as at T1. During the meeting the RA solicited comments from women about their experiences with the home-based exercises and collected the 5 Condom Use Diary Forms. One month later women received an email with a link to the third questionnaire (T3) that assessed sexual behavior and condom use during the past 30 days. Email reminders were sent if no response was received. Women were paid \$10 for T1, \$15 for T2, and received a \$20 gift card at T3.

Measures

Attitudinal variables

Perceived barriers to condom use. A 7-item scale, the Effect on Sexual Experience subscale of the Condom Barriers Scale,³³ assessed perceived barriers to condom use related to the sexual experience (e.g., “condoms feel unnatural”). Responses were made on a 5-point scale “strongly disagree” to “strongly agree”; $\alpha=.79$).

Condom attitudes. The 5-item Pleasure Associated with Condoms subscale of the Multidimensional Condom Attitudes Scale (MCAS)³⁴ (e.g., “Condoms ruin the sex act”). Response options were made on a 7-point scale (“Strongly disagree” to “Strongly agree”; $\alpha=.70$).

Embarrassment about Negotiation of Use of Condoms of the MCAS (e.g., “When I suggest using a condom I am almost always embarrassed”) 5-item scale was used. Response options were made on a 7-point scale (“Strongly disagree” to “Strongly agree”; $\alpha=.95$).

Condom use self-efficacy. The 28-item Condom Use Self-Efficacy Scale (CUSES)³⁵ was used to assess self-efficacy. A sample item was “I feel confident in my ability to use a condom correctly.” Response options were made on a 5-point scale (“Strongly disagree” to “Strongly agree”; $\alpha=.91$).

Condom experience variables

Also at T1, T2, and T3, five items measured the degree to which condom use at last sex impacted sexual arousal, desire, pleasure, orgasm, and emotional closeness to partners. A sample item was “The last time you had sex using a condom, to what degree did using a condom impact your arousal?”; responses were made on a 5-point scale (“greatly decreased” to “greatly increased”). **The five-item scale produced an inter-item reliability coefficient of $\alpha = .79$ was used to create mean scores that were used as a study outcome measure.**

Behavioral variables

Questions included the number of different partners for **penile-vaginal sex (PVI) or penile-anal sex (PAI)**, **the number of times PVI or PAI** occurred, the number of times a condom was used for PVI or PVA, the number of times women performed oral sex on a male partner, and on how many of these times a condom was used, and whether condoms were used during the last time they had PVI or PAI. The recall period for T1 was the past 3 months; for T2 it was since the participant began the study; and for T3 it was for the previous 30 days. In addition, T1 assessed the number of lifetime PVI

and PAI partners. At T1, T2, and T3 condom use errors and problems were assessed for the last condom use event for either PVI or PAI (see Table 3).

Participants' perceptions of the intervention

5 Perceptions of the intervention were assessed at the end of the online T3 questionnaire. Six questions assessed: "how likely is it that what you learned in this study will help you..." (1) use condoms more often, (2) better enjoy sex when condoms are used, (3) help your sex partner(s) better enjoy sex when condoms are used, (4) to better negotiate condom use in the future, (5) to better apply condoms in the future, and (6) to use lubricants with condoms. Five response options were
10 provided ("extremely likely" to "extremely unlikely"). Finally, an open-ended question at T3 asked: "Is there any way the program could be improved to be more useful or effective? Please give some suggestions."

Data Analysis

15 The inter-item reliability of the scale measures administered at baseline was tested, using Cronbach's alpha. Scale measures were compared across T1, T2, and T3 using the repeated measures analysis function within the General Linear Model. **Repeated measures tests can become too liberal if the assumption of sphericity (i.e., equality of all variances of the differences between all combinations of related groups) are violated. Therefore, sphericity was**
20 **tested using the Mauchly's test. When the sphericity assumption was not violated, the Pillai F-test was used as the assessment points was required, a paired-samples t-test**

was used. If the assumptions of sphericity was violated, the more appropriate nonparametric Friedman's test with a post-hoc Wilcoxon signed-rank test were used.

Also, we combined the number of times women reported PVI and PAI at baseline and the follow-up assessment. Similarly, we combined the number of times condoms were used for both PVI and PAI at baseline and the follow-up assessment. We then calculated the proportion of times condoms were used for PVI and PAI. Next, because we were interested in learning whether the intervention was particularly effective for women who were least likely to use condoms, we further compared the women scoring in the lower quartile on this computed variable with the remainder. Significance was defined by an alpha of .05. All analyses were conducted using SPSS (version 22.0).

RESULTS

Sample description

Of the 67 women enrolled, 64 (95.5%) completed T2 and 61 (91.0%) completed T3. Almost half (45.5%, n=30) reported being in concurrent sexual relationships with more than one partner and the lifetime number of vaginal sex partners ranged from 2 to 40 (M=11.16, SD=8.93). Table 1 presents the demographic characteristics.

Attitudinal variables

Table 2 displays the means and the relevant test statistics for all attitudinal measures. For all measures intervention effects were found at T2 and sustained at T3. Condom use self-efficacy, attitudes related to embarrassment about condom negotiation and use, and pleasure experienced during condom-protected experiences improved at T2 and significant differences were maintained at

T3. Perceptions of pleasure-related barriers to condom use were significantly reduced at T2 and this reduction was maintained at T3 (see Figure 1).

Condom use experience variables

Taking the last time condom use occurred as the recall period, 5 variables were assessed at each time point. As shown in Table 2, with the exception of emotional closeness, the intervention had a significant effect on all of the measures at T2 as well as at T3.

Behavioral variables

Table 3 presents the proportion of women reporting the 8 selected errors/problems. We created a score by summing these errors/problems for each assessment point. The mean scores were: T1 1.81 (SD = 1.23) at T2 1.27 (SD = .98), and at T3 1.10 (SD = .87). Using a repeated-measure ANOVA, a significant F-value was obtained ($F(2,56) 8.79, p = 0.001$). In post-hoc paired-samples t-tests, the decrease in mean error/problem scores between T1 and T2 was significant ($t(62) 3.18, p = 0.002$). T2 and T3 Index scores were not significantly different ($t(df 58) 1.30, p = 0.20$).

Overall, condom use during PVI and PAI was 59.7% at T1 and 66.4% at T3. However this figure included 19 women using condoms 100% at T1, who were eliminated from this analysis, as were those reporting not having sexual intercourse during the assessment period. Among the remaining women, there was a mean difference between T1 (mean of 45% condom use) and at T3 (mean of 50% condom use) (Pillai's Trace $df 1/33, F = 5.05, p = .03$). Additionally, the effect was strongest for those in the lowest quartile who increased from 16.1% at T1 to 41.5% at T3.

Participants' perceptions of the intervention

In response to the question about what they learnt in the study, over 75% of participants reported that it was extremely likely or likely that the intervention would help them use condoms and

lubricant more, negotiate for condom use, apply condoms correctly, and better help they and their partner enjoy sex with condoms more.

In response to the open-ended question about the intervention at T3, women's comments focused on the valuable information they learned about condoms and lubricants and increased comfort around condom negotiation and application. Comments included the following:

"I feel a lot more comfortable putting on condoms and a lot less guilty letting myself masturbate."

"This study really opened my eyes about condom usage as a whole. It made me more comfortable with using condoms and caused me to view condoms in a better light. I feel like it's given me more confidence in discussing and using condoms with my partner."

"I also appreciate how more comfortable I feel when I brought up the topic of trying different condoms and lubricants and not feeling embarrassed."

"This study introduced me to the wonders of lube and I'm thankful for that."

In response to the question about how the program could be improved, feedback focused on two aspects: the dildo provided and whether male partners should be incorporated into home practice. Several women provided suggestions related to the type of dildo provided: "more realistically sized dildos"; "smaller sex toy. It was quite intimidating or possibly one with a vibration option"; "a smaller dildo or choice between sizes." Many women suggested that doing the exercises with a sexual partner rather than alone might be beneficial e.g., "I think it might be helpful to allow use of the condoms and lubricants with a sexual partner rather than simply alone"; "I feel that guys have bigger issues with condoms than girls do so finding a way to incorporate them into the study may yield more useful results."

Comments

This pilot study evaluated a brief, self-guided “home-based” program designed to improve male condom use attitudes and behaviors among young women. A unique feature of this program is that women can explore, on their own and at their own pace and comfort level, a range of condoms and lubricants. Both the quantitative data and the qualitative comments suggested that young women found the broad range of condoms and lubricants “eye-opening” and experimentation enabled them to find condoms and lubricants that optimized their overall sexual experience. Previous research has highlighted the importance of pleasure in shaping women’s condom use.^{1,15} The pleasure-oriented aspect of this program reduced negative attitudes about condoms and enabled women to become more comfortable with their own sexual responses while using condoms. In addition, women reported improved comfort in acquiring condoms and using condoms during PVI/PAI. The findings support previous studies that have demonstrated women’s agency with respect to condom use.¹⁰⁻¹³ This brief and low-resource intervention was highly effective among sexually active university women, particularly those who used condoms less often at baseline.

In addition to the positive changes in attitudes and sexual experiences using condoms, the fact that the overall proportion of condom use increased is noteworthy. Particularly striking was that for those in the lowest quartile for condom use at baseline condom use more than doubled their use at T3.

Additionally, our findings are consistent with the Fisher and Fisher’s IBM model which posits that information, motivation, and behavioral skills are needed for changes in health behaviors.³⁶ They are also consistent with the Condom Use Experience Model,²¹ that highlights the quality of

sexual experiences during condom use as an important factor influencing consistency of condom use and condom use errors and problems.

Although *KI-HERS* focuses on young women, it is plausible that participants' male partners may also have learned about pleasure-oriented aspects of condoms and lubricants. These learning experiences may be as or more important for college/university students as didactic classroom-based learning. Moreover, teaching young women about condom use may create lifelong habits that protect them well into their adulthood.

The findings from this single-arm trial of KI-HERS are encouraging and warrant a subsequent study that uses an attention-equivalent control group. Future research should proceed in several

directions. First, it is likely that women who have yet to become sexually active can benefit from the *KI-HERS* program, potentially preparing them for more pleasurable and safer sex with condoms. Second, studies should incorporate substantially longer follow-up periods to determine whether positive intervention effects are sustained. Subsequent and larger studies should also investigate whether young women communicate about their pleasurable experiences with condoms to male and female peers, thereby suggesting a diffusion effect. A final direction is to ultimately determine the feasibility and cost-effectiveness of implementing this program more broadly in college/university settings.

Implementation of this program may be greatly facilitated by the point that the intervention is self-guided. Because of this feature, the level of time devoted by clinic staff is minimal (< 30 minutes). Even this minimal time commitment can be covered by it is important to note that a newly passed Medicaid policy will reimburse clinics for preventive counseling sessions.³⁷ Further, implementation may be enhanced by the idea that the program could be expanded to include a foci on oral sex.

Limitations and Conclusion

This pilot study had four possible limitations. First, the sample may have been biased because they were a group of women willing to experiment with condoms, lubricants, and dildos. Indeed the majority of participants were already using condoms three-quarters of the time, leaving **little room** for improvement. Second, the study was uncontrolled; because of the exploratory nature of the study, a control group was not included. Therefore, we cannot rule out testing or expectancy effects. Third, the 30-day follow-up assessment meant that we could not conclude that intervention effects would be sustained beyond this period. Finally, we acknowledge that the different recall periods used at baseline and the follow-up assessments have the potential to introduce systematic error. To minimize this source of possible error, all condom use behaviors were converted to percentages.

In our small pilot study of a novel, self-guided condom use intervention focused on young women, the findings were highly promising. The analyses demonstrated not only that the intervention can be efficacious, but also informs how the program functions. The tailored and low-resource nature of the program enables clinic- and campus-based administration of the program to young undergraduate women, perhaps alongside counseling and prescription of other contraceptive methods. Moreover, the findings highlight the potential utility of the intervention for women who are not using condoms consistently. This pleasure-oriented program represents a move away from the more traditional, risk-based, and male-focused methods of intervention. Although promising, a larger randomized controlled trial should be conducted to more definitively establish the efficacy of the *KI-HERS* intervention.

More consistent and correct condom use could reduce not only STI transmission, but also unintended pregnancy rates in young undergraduate women. The low-cost and resource nature of

this program makes it accessible to college/university health clinics, even in times of **sparse fiscal environments**. Further, because of the brief nature of this program, fidelity is likely to be high, thereby helping to ensure program success.

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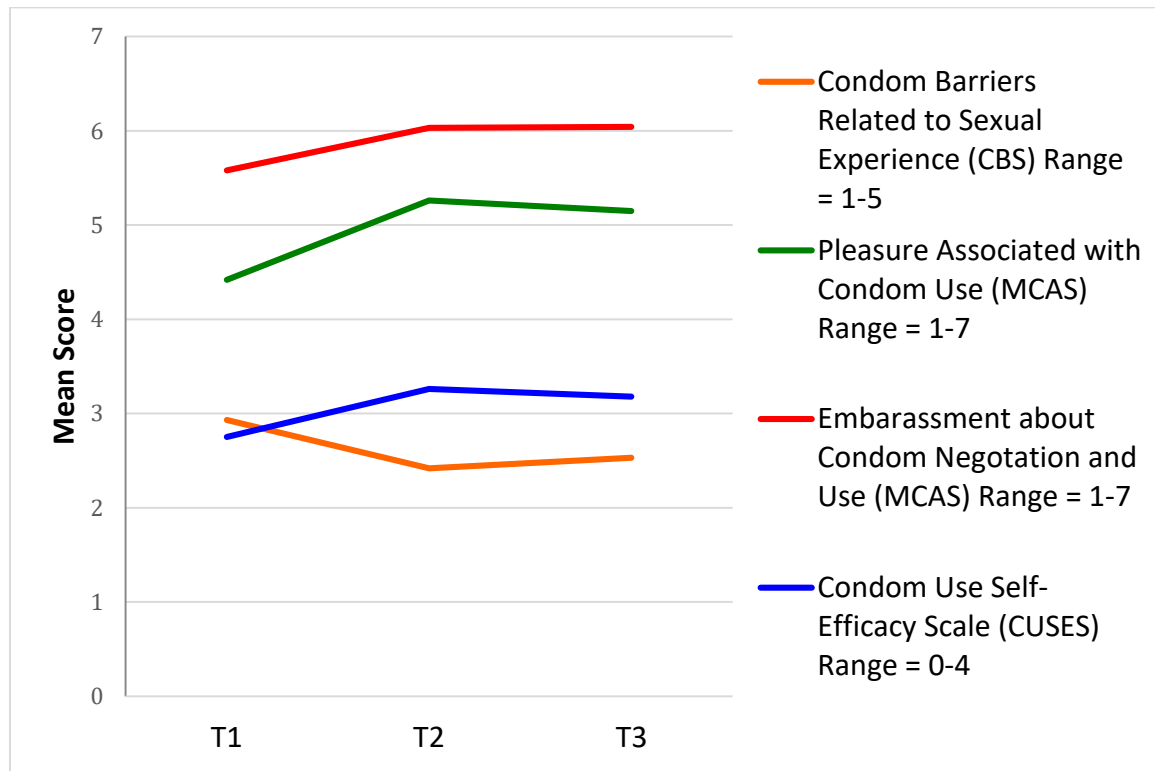
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Figure 1. Mean change in outcome variables across T1, T2, and T3.



Ethnicity		% (N)	5	TABLE 1. Demographic Characteristics (N = 67)
White		77.3 (51)		
Black or African American		9.1 (6)		
Southeast Asian (e.g., Chinese, Japanese, Korean, Vietnamese, Cambodian, Filipino.etc)		4.5 (3)		
Latin American (Costa Rican, Guatemalan, Brazilian, Columbian, etc)		6.0 (4)		
Biracial/Multiracial		3 (2)		
Sexual Orientation			10	
Heterosexual (straight)		69.7 (46)	15	
Bisexual		21.2 (14)		
Queer		3.0 (2)		
Uncertain		1.5 (1)		
Questioning		3.0 (2)		
Pansexual		1.5 (1)		
Gender			20	
Woman		98.5 (65)		
Genderqueer		1.5 (1)	25	
Relationship type*				
Single, not hooking up or in a relationship with anyone		7.6 (5)		
Have a fuck buddy		7.6 (5)		
Have more than one fuck buddy		12.1 (8)		
In a "friends with benefits" relationship		18.2 (12)		
In more than one "friends with benefits" relationship		7.6 (5)		
Hooking up with one person occasionally		18.2 (12)		
Hooking up with more than one person occasionally		1.5 (1)		
Hooking up with one person regularly		12.1 (8)		
Hooking up with more than one person regularly		13.6 (9)		
Casually dating one person		9.1 (6)		
Casually dating more than one person		9.1 (6)		
Seriously dating one person		21.2 (14)		
Cohabiting		3.0 (2)		

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Note. Responses for relationship type total more than 100% because participants were able to report being in more than one relationship.

Outcome Variables	T1 <i>M (SD)</i>	T2 <i>M (SD)</i>	T3 <i>M (SD)</i>	Significance Testing		TABLE 2. Means and standard deviations at each assessment period for outcome variables Note. Numbers within a row that do not share superscript letters are significantly
Condom Use Self Efficacy (CUSES) Range 0-112	76.71 ^a (17.45)	91.36 ^b (13.05)	88.98 ^b (13.85)	$F(2,56) = 32.040$ $p < .001$	5	
Effects on Sexual Experience (CBS) Range 1-5	2.93 ^a (.70)	2.42 ^b (.58)	2.53 ^b (.68)	$F(2, 58) = 19.336$, $p < .001$		
Pleasure associated with condom use (MCAS) Range 1-7	4.42 ^a (.95)	5.26 ^b (.80)	5.15 ^b (.89)	$F(2, 57) = 26.046$, $p < .001$	10	
Embarrassment about Negotiation and Use of Condoms (MCAS) Range 1-7	5.58 ^a (1.47)	6.03 ^b (.99)	6.04 ^b (.85)	$F(2, 57) = 4.610$, $p = .014$	15	
Last time, condom impact: Range 1-5					20	
Desire	3.26 ^a (1.03)	3.81 ^b (.95)	3.74 ^b (1.00)	$F(2,29) = 4.91$, $p = .015$		
Arousal	3.29 ^a (1.04)	3.87 ^b (.94)	3.82 ^b (.83)	$F(2,36) = 7.886$, $p = .001$		
Orgasm	2.58 ^a (1.10)	3.73 ^b (1.18)	3.73 ^b (1.22)	$F(2,24) = 15.300$, $p < .001$	25	
Pleasure	3.16 ^a (1.13)	3.77 ^b (1.11)	3.84 ^b (1.00)	$F(2,29) = 9.311$, $p = .001$		
Emotional Closeness	2.83 (1.23)	3.21 (1.24)	3.17 (1.31)	$F(2,27) = 2.11$, $p = .141$	30	

different from each other at the $p < .05$ level.

35 **TABLE 3. Descriptive comparison of change in condom use errors and problems**

Error/Problem	T1 % (N)	T2 % (N)	T3 % (N)
Not discussing condom use before sex	45.5 (30)	40.6 (26)	47.5 (28)
Late application of condoms	16.7 (36)	15.6 (10)	18.6 (11)
Early removal of condoms	31.8 (21)	10.9 (7)	10.2 (6)
Condom broke during sex	1.5 (1)	4.7 (3)	0 (0)
Condom slipped off during sex	6.1 (4)	3.1 (2)	3.4 (2)
Condom slipped off during withdrawal	6.1 (4)	3.1 (2)	1.7 (1)
Problems with fit and feel	24.2 (16)	12.5 (8)	13.8 (8)
Partner problems with fit and feel	35.4 (23)	17.2 (11)	12.3 (7)

