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Teaching Condom Use Skills: Practice is Superior to Observation

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Abstract

Men exposed to a condom skills practice exercise were hypothesized to perform better on condom skills measures than those exposed only to a demonstration or to no intervention. As part of a larger NIDA Clinical Trials Network HIV Prevention protocol men in substance abuse treatment were administered male and female condom use skills measures (MCUS, FCUS) at pre-intervention, two weeks, 3 months and 6 months post-intervention. The MCUS and FCUS scores were compared for three intervention exposure groups (demonstration only [DO, n=149], demonstration plus practice [D+P; n=112], attended no sessions [NS, n=139]) across the 4 assessment time points using a mixed effects linear regression model. There is a statistically significant intervention group-by-time effect ($p<.0001$) for both the MCUS and FCUS. Post hoc, pairwise linear trends across time indicated that for both the MCUS and the FCUS the D+P group is significantly superior to the DO group and the NS group.

Keywords

HIV prevention; condom skills; teaching methods

Introduction

The transmission of HIV and other sexually transmitted infections (STI) is a serious public health problem, especially amongst substance abusers. Injection drug use has been directly and indirectly related to the spread of HIV, accounting for 36% of all HIV cases in the United States (1). Non-injection substance abusers also contribute to the spread of HIV. One study by the Centers for Disease Control and Prevention (CDC) found that crack smokers in an inner-city were three times more likely than non-crack smokers to be infected with HIV (1). Substance abusers may engage in risky behaviors such as trading sex for drugs or money, or engaging in other risky behaviors that they may not engage in when sober (1–2).

Interventions aimed at reducing HIV transmission have been shown to significantly increase safe sex practices, such as condom use (1–2). Drug abuse treatment centers have a special

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role in reducing HIV behaviors through HIV education, promotion of effective condom use skills, and distribution of condoms (3). Sorenson and Copeland (3) emphasize that treatment centers are in a special position to help reduce risky behaviors because they are in contact with high-risk populations, such as sex workers and intravenous drug users. Drug abuse treatment decreases the risk of HIV/STI by reducing involvement in risky drug use behaviors and, to a lesser extent, increasing safe sex practices (3–4). In their meta-analysis of HIV prevention interventions within substance abuse treatment settings Prendergast et al. (4) noted that 15 of the 18 studies utilized condom demonstration and five contained a condom distribution.

The CDC, the National Institute on Drug Abuse (NIDA), and the Food and Drug Administration promote educational efforts that emphasize the importance of using condoms and instructions for their proper use and disposal (2). Condoms are effective, supporting the rationale of promoting condom use in educational efforts to reduce HIV/STI risk amongst substance abusers (5–7). To achieve maximum protection male and female condoms need to be used correctly. Incorrect application and use can lead to condom failure (8–10).

HIV prevention interventions provided in substance abuse treatment programs can vary greatly in their focus and intensity (4,11). Some HIV/STI prevention programs may emphasize the importance of using condoms without demonstrating their correct usage. At some other programs, facilitators may use models to demonstrate correct condom application. Yet other programs require patients themselves to practice applying the condoms to models. In other words, programs differ in the extent to which they incorporate the methods of “telling,” “showing,” and “practicing” when working toward increasing condom use or other changes in health behavior. At a theoretical level, the Information, Motivation, Behavioral Skills (IMB) model of HIV preventive behavior is an empirically based way of conceptualizing the components of health-related behavior change (12–13). The IMB model states that HIV prevention information, HIV prevention motivation, and HIV prevention behavioral skills are the three basic determinants of HIV preventive behavior.

Studies from non-substance abuse treatment settings have indicated that practice is superior to showing, which is superior to telling. Lindemann et al. (14) demonstrated that with college students condom use skills improved after watching a demonstration on correct condom use compared to no intervention. Condom use skills improved more if the demonstration was accompanied by practice sessions. Galvão et al. (15) found in a Brazilian sample that attending a family planning clinic demonstration and practice were superior to instructions to read package inserts for both the male and female condom. Van Devanter et al. (16) reported improved condom skills for high risk women who were provided demonstration and practice opportunities for female condom use, compared to a no-intervention control group.

The current paper is intended to determine if, in substance abuse treatment settings, practicing condom use skills is better for skill acquisition than observing a condom demonstration. Patients in substance abuse treatment programs may not be as motivated to learn condom use skills as other groups studied in the literature, (e.g., patients attending an STI clinic or college students). Accordingly, this paper has two hypotheses. First, men attending the two sessions of a five-session HIV prevention intervention during which the correct use of condoms is demonstrated and then practiced (D+P), will perform better on a condom use skills measure than men attending only a one-session intervention during which the correct use of condoms is only demonstrated (DO). Second, men attending the single-session HIV prevention intervention (DO) will perform better on a condom use skills measure than men attending no intervention sessions (NS).

Method

Participants

Men enrolled in 14 substance abuse outpatient treatment programs (7 methadone maintenance and 7 psychosocial) across the US were recruited to take part in an HIV/STI prevention project specifically tailored for men and conducted by the National Institute on Drug Abuse Clinical Trials Network (17). Recruitment procedures included posting flyers and brochures in the clinic, making announcements in treatment groups about study recruitment, and "open houses" hosted by the research staff. To be included in the study, men had to be 18 or older, have engaged in unprotected vaginal or anal intercourse in the prior 6 months, and be willing to attend HIV/STI prevention groups and complete assessments at baseline and at 2 week, 3 months and 6 months post intervention. Men were excluded if they had a primary partner planning to get pregnant or a Mini Mental Status Exam Score < 25 (18). Of 993 men screened for study inclusion, 590 met study inclusion/exclusion criteria and were randomized to attend either a five-session gender specific HIV prevention intervention or a one-session HIV didactic education intervention. This report focuses on men who completed the male and female condom skills baseline assessment, and at least one of the post intervention assessments conducted at 2 week, 3 months and 6 months. Of the 590 participants, 494 completed a baseline and at least one follow-up assessment. Of these, 262 (53%) completed all follow-up assessments.

Interventions

The HIV-Education (HIV-Ed) intervention consisted of a 60 minute didactic presentation which covered the following areas: HIV/AIDS update; HIV risky behaviors-injection practices; HIV risky behaviors-sexual practices; healthy options, condom demonstrations, and overcoming barriers to condom use. For the condom demonstration the group facilitator demonstrated the correct application and removal of a male condom on a plastic penile model and the correct use of lubricant if desired. In addition the correct insertion and removal of a female condom with a pelvic model was demonstrated by the facilitator. During the demonstrations large flipcharts with the correct steps were displayed and referred to by the facilitators, thus providing multiple modes of teaching materials. The Real Men Are Safe (REMAS) intervention consisted of five 90 minute sessions which included didactic material, brainstorming and discussion sessions, condom demonstrations, condom use practice, self assessment and risk reduction motivation exercises, and risk refusal role-plays. In session 1 of REMAS, participants are exposed to the same condom demonstration as participants who attended the HIV-Ed condition. For 15–20 minutes In REMAS session 2, participants are placed in dyads and given a packet of six male condoms, a lubricant sample and a penile model. Participants are also provided with a male condom use checklist. Each participant takes a turn practicing applying and removing the condom to and from the model. The other member of the dyad marks the male condom use checklist and corrects any mistakes. Participants are then provided with a female condom, the pelvic model and the female condom use checklist. The above procedures are repeated for insertion and removal of the female condom. Upon practice completion the large flipchart with correct application/insertion and removal procedures is displayed and the facilitator concludes the segment by briefly reviewing these procedures.

Measures

Presented in Table 4 are the items for the male condom use skills measure (MCUS, 14 items) and the female condom use skills measure (FCUS, 11 items). The items for each scale correspond to the steps for correct condom use being taught in the parent study interventions. The MCUS included all seven items of the Condom Skill Scale of Farris et al. (19) previously shown to be a valid measure. For the MCUS five types of condoms and four

types of lubricant are placed on a table in front of the participant along with a plastic penile model. Participants are asked to choose a condom which would provide protection from HIV and apply and remove the condom from the model, verbalizing what they are doing as they do it. Participants receive a point for each activity they demonstrate correctly. For the FCUS a female condom and a pelvic model are placed on the table. The application/removal instructions are repeated. Scoring proceeds as above. A limitation to the scoring method was using an equal weight for each item. Some items such as "getting all the air out," maybe more salient for preventing condom failure than others such as "check date."

Procedures

Participants were divided into the following three attendance groups: 1) demonstration only (DO), attended the single session HIV-Ed group (n=149); 2) demonstration and practice (D+P), attended sessions 1 and 2 of the REMAS group (n=112); 3) no sessions (NS), men who were randomized to one of the two interventions, but attended no sessions (n=139). Inclusion in the NS group reflects self selection by non-attendance rather than randomization as is true for the D+P and DO groups. Of the 590 potential participants, 94 did not have follow-up assessments, 10 did not have baseline data available, 10 did not have complete attendance records, and 76 attended some of the REMAS sessions but not both sessions 1 and 2. Therefore, data from 400 participants were used in the present analyses. Of these, 262 (65.5%) completed all follow-up assessments, 85 (21.3%) had assessments at two time points, and 53 (13.3%) had only one follow-up assessment available.

Data Analysis

Differences between the attendance groups on demographic characteristics were assessed by an analysis of variance test for continuous variables and chi-square test for categorical variables. Due to the small frequencies of some categories of marital status and ethnicity, these variables were collapsed into binary variables of married/co-habitating versus not married/not co-habitating, and minority versus non-minority status.

To ensure the intervention groups did not differ on MCUS and FCUS at baseline, scores were compared using an ANOVA model (MCUS [$F_{2,397} = 1.32$, $p = .268$]; FCUS [$F_{2,383} = 1.07$, $p = .345$]. Since the groups were not different at baseline the MCUS and FCUS scores were then compared for the three intervention exposure groups across the 4 assessment time points (baseline, a two-week post-intervention assessment, and 3- and 6-month follow-up) using a mixed effects linear regression model. Since there were missing data, least squares means are used to describe any differential effects observed. Least squares means are predicted population margins, that is, they estimate the means as if there were no missing data across time. To further assess differences on MCUS and FCUS scores, post hoc, pairwise linear trends across time were conducted, with a Bonferonni correction ($\alpha = .05/3 = .017$) for Type I error for each outcome measure.

For a follow-up assessment, repeated measures logistic regression analyses was conducted on each item to assess differences between the D+P group and a group combining both DO and NS participants. The DO and NS groups were combined for this secondary analysis since they were not statistically different on the primary outcome analyses.

Results

Demographic characteristics are presented in Table 1. Results indicated a marginally statistically significant difference in age ($F_{2, 397} = 3.03$, $p = .049$). However, post hoc analysis of pairwise comparisons with Bonferonni correction did not reveal differences on age. There was no difference found on education level ($F_{2, 397} = 1.00$, $p = .370$) and net

income ($F_{2, 397}$ = 1.52, p = .220). Also, no difference was found between the attendance groups on minority status. However, differences were found on marital status and treatment modality. That is, there were greater percentages of NS participants married in comparison to those in DO (χ^2_1=6.31, p = .012) and greater percentages in psychosocial outpatient services than in methadone maintenance in comparison to the D+P group (χ^2_1=6.49, p = .011) group. The DO and D+P groups did not differ on marital status or treatment modality.

Presented in the top half of Table 2 is the summary tables for the full mixed linear regression models (baseline scores included). There is a statistically significant attendance group-by-time interaction effect for both the MCUS and FCUS (p < .001). Presented in the bottom half of Table 2 are the summary tables for the mixed linear regression models with baseline scores removed. For both the MCUS and FCUS there are significant main effects for group intervention (p < .001), but not for group-by-time interactions. These results suggest the greatest change is from baseline to post-intervention (top half of table 2) with little change across the follow up assessment time points (bottom half of table 2). Presented in Table 3 are the least square means for each intervention attendance group across the four assessment periods.

To further assess and characterize the differences presented in Table 3, post hoc, pairwise linear trends across time were conducted, with a Bonferonni correction (α = .05/3 = .017). For MCUS, comparisons indicated that the D+P group is significantly different from the DO group ($F_{1,1000}$ = 9.75, p =.002) and the NS group ($F_{1,1000}$ = 25.56, p < .001). But the DO and NS groups are not statistically different from each other ($F_{1,1000}$ = 4.74, p = .030). For the outcome of FCUS, comparisons indicated that the D+P group is significantly different from the DO group ($F_{1,962}$ = 12.41, p < .001) and the NS group ($F_{1,962}$ = 23.90, p < .001). But the DO and NS groups are not statistically different ($F_{1,962}$ = 2.59, p = .108) from each other on FCUS scores. Following up on the statistically significant main effect for attendance group after baseline (see second summary table in Table 2), pairwise group differences were also evaluated using the three assessments at post-intervention, 3- and 6-months follow-up. For MCUS, pairwise comparisons indicated all groups were different from each other (p < .001), with the least squares main effect attendance group mean being greatest for D+P (10.56), followed by DO (8.98), and NS (7.86). A similar finding was observed for FCUS, with a least squares mean highest for D+P (9.28) than for DO (7.63), which in turn, is higher than NS (6.40).

As a follow-up, repeated measures logistic regression analyses were conducted to assess differences at the item level between the D+P group and a group combining both DO and NS participants. The results presented in Table 4 indicate p-values associated with the time-by-group interaction effect. Since the results suggested that the greatest change is from baseline to post-intervention with little change across the follow up assessment time points, only baseline and post-intervention assessments were considered in this analysis. The D+P group revealed a significant increase (p < .05) over the DO and NS combined group on the following MCUS items: choosing a latex condom, checking date, opening the package carefully, checking for damage, getting air pockets out, leaving space in the tip, adding lubricant, avoiding spills upon removal, and disposing in the trash. It is important to note, that 3 of the items which did not reach statistical significance (determined direction to roll, rolled correctly downward, and rolled to base of penis model) revealed high baseline percentages (> .80) and therefore there was little room for improvement.

The D+P group also had a significant increase (p < .05) over the DO and NS combined group on the following FCUS items: checking date, opening the package carefully, adding lubricant, squeezing the inner ring between finger for insertion, pushing inner ring into

vaginal canal while squeezed, getting inner ring over cervix, twisting outer ring and pulling for removal, disposing in trash.

Discussion

Consistent with findings from previous research conducted in other settings (14–16) men in this study who were in substance abuse treatment could effectively be taught correct male and female condom use skills and maintain those skills for up to six months. The results of this study indicate that the greatest change from baseline measures on condom use skills occurred with the D+P group, but that the DO and NS groups did not differ from each other on this change over time. However, the results after baseline support the hypothesis that participants exposed to a practice exercise would perform better on condom skills measures than those exposed only to a demonstration, who would in turn, perform better than participants exposed to neither. Similarly Lindemann et al (14) found that with college students extensive practice was superior to demonstration and limited practice in teaching male condom use skills. Differences observed included performance on items critical to potentially preventing male condom failure such as “getting the air out,” ” leaving space in the tip” and “avoiding spills during withdrawal and removal.” Differences observed on potentially critical female condom skill items included “spreading the lubricant evenly,” “insert in vaginal canal without twisting,” “ensuring outer ring covered vaginal opening,” “ensure Inner ring covered cervix,”-and ”“twisting outer ring and pulling for removal.” It is hoped that possessing the correct condom use skills could lead to a lowering of the condom failure rates noted in the introduction section (8–10). This appears to be a reasonable hope since experience with condom usage was associated with reduced condom failure in those studies.

Findings from the current study address two dimensions of the IMB model (13), information and behavioral skills. Clearly condom use knowledge and behavioral skills as measured by the MCUS and FCUS are improved by viewing a demonstration and further enhanced by practice. According to the IMB model having condom use knowledge and behavioral skills alone would not predict actual condom use. According to the IMB model motivation to use condoms (e.g. viewing self at risk for acquiring an STI, and not viewing condoms as greatly reducing pleasure) as well as having adequate condom use negotiation skills would be necessary to determine whether condoms would actually get used. In the parent trial we were able to demonstrate an increase in condom use by men who attended the Real Men Are Safe intervention (17). Based on the findings reported here we can have confidence that most of these men now know how to use condoms correctly.

The NIDA Clinical Trials Network (CTN) HIV Workgroup conducted a “snapshot” survey of CTN community drug abuse treatment programs’ HIV assessment and prevention practices in the spring of 2001 (11). Most programs (80.4%) reported providing some type of HIV education to all clients. For most programs (85.4%) the amount of education provided ranged from 30 to 90 minutes (mode=60 minutes [53.3% of clinics]) delivered in a single group or individual session. The bulk of the education delivered was limited to providing basic information about HIV and risk behaviors associated with its transmission. Skill training interventions that used tools such as role-plays and practice of putting condoms on models were infrequent. Findings from this study would suggest at a minimum programs would be well advised to add condom practice exercises to their HIV education and prevention efforts. However, skill training interventions by their very nature are more expensive to provide than information only interventions. Substance abuse treatment programs must be able to see the value of the added cost if they are to provide such interventions. Hopefully findings such as those presented here will help programs justify the increased cost.

The finding that participants maintained their skills over six months is encouraging as there is often a concern that skills will deteriorate over time. However, this result must be viewed with caution as the prior post intervention assessments may have been providing practice "booster sessions." A 6 month only post intervention assessment condition would be necessary to tease out whether frequent assessments were contributing to skills being maintained. However, assessment sessions did not appear to help increase condom skills as MCUS and FCUS scores did not improve much across post intervention assessments for the DO and NS groups.

Several limitations of the current study should be considered to place the results in context. Although the study was conducted in a variety of settings and had few exclusion criteria, the limits on generalizability of the findings in terms of patient factors such as self referral to the study, age, type of substance of abuse, psychiatric and substance abuse diagnosis, and sexual history, have not been explored. Although participants were randomly assigned in the parent protocol to attend either HIV-Ed or REMAS, the group assignment for the current analysis only partially reflects that randomization. Participants in the NS group had been randomly assigned to attend either HIV-Ed or REMAS. Their inclusion in the NS group reflects self selection by non-attendance, rather than random assignment. Similarly several potential participants were excluded because their pattern of session attendance did not allow placement in the three groups of interest in this study.

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References

1. Centers for Disease Control and Prevention. Drug-associated HIV transmission continues in the United States. Centers for Disease Control and Prevention May 2002. Retrieved on January 3, 2008 from http://www.cdc.gov/hiv/resources/factsheets/idu.htm.
2. National Institute on Drug Abuse. Principles of HIV Prevention in Drug-Using Populations: A Research Based Guide. Bethesda, MD: National Institutes of Health; 2002. Publication No. 02-4733.
3. Sorensen JL, Copeland AL. Drug abuse treatment as an AIDS prevention strategy: a review. Drug Alcohol Depend. 2000; 59:17–31. [PubMed: 10706972]
4. Prendergast ML, Urada D, Podus D. Meta-analysis of HIV risk-reduction interventions within drug abuse treatment programs. J Consult Clin Psychol. 2001; 69:389–405. [PubMed: 11495169]
5. Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. The Cochrane Database of Systematic Reviews 2002; Issue 1: Art. No.: CD003255. DOI: 10.1002/14651858.CD003255.
6. Warner L, Newman DR, Austin HD, Kamb ML, Douglas JM Jr, Malotte CK, Zenilman JM, Rogers J, Bolan G, Fishbein M, Kleinbaum DG, Macaluso M, Peterman TA. for the Project RESPECT Study Group. Condom effectiveness for reducing transmission of gonorrhea and Chlamydia: The importance of assessing partner infection status. Am J Epidemiol. 2004; 159:242–251. [PubMed: 14742284]
7. Warner L, Stone KM, Macaluso M, Buehler JW, Austin HD. Condom use and risk of gonorrhea and Chlamydia: A systematic review of design and measurement factors assessed in epidemiologic studies. Sex Transm Dis. 2006; 33:36–51. [PubMed: 16385221]
8. Warner L, Newman DR, Kamb ML, Fishbein M, Douglas JM Jr, Zenilman J, D'Anna L, Bolan G, Rodgers J, Peterman T. for the Project RESPECT Study Group. Problems with condom use among patients attending sexually transmitted disease clinics: Prevalence, predictors, and relation to incident gonorrhea and Chlamydia. Am J Epidemiol. 2008; 167:341–349. [PubMed: 17989058]

9. Beksinska M, Smita J, Mabudea Z, Vijayakumarb G, Joanis C. Performance of the Reality® polyurethane female condom and a synthetic latex prototype: a randomized crossover trial among South African women. Contraception. 2006; 73:386–393. [PubMed: 16531173]
10. Valappil T, Kelaghan J, Macaluso M, Artz L, Austin H, Fleenor ME, Robey L, Hook EW III. Female condom and male condom failure among women at high risk of sexually transmitted diseases. Sex Transm Dis. 2005; 32:35–43. [PubMed: 15614119]
11. Shoptaw S, Tross S, Stephens MA, Tai B. NIDA Clinical Trials Network HIV/AIDS Workgroup. A snapshot of HIV/AIDS-related services in the clinical treatment providers for NIDA's Clinical Trials Network. Drug Alcohol Depend. 2002; 66:S163.
12. Fisher JD, Fisher WA. Changing AIDS-risk behavior. Psychol Bull. 1992; 111:455–474. [PubMed: 1594721]
13. Fisher, JD.; Fisher, WA. Theoretical approaches to individual level change in HIV risk behavior. In: Peterson, JL.; DiClemente, CC., editors. Handbook of HIV prevention. New York: Kluwer Academic/Plenum Press; 2000. p. 3-55.
14. Lindemann DF, Brigham TA, Harbke CR, Alexander T. Towards errorless condom use: A comparison of two courses to improve condom use skills. AIDS Behav. 2005; 9:451–457. [PubMed: 16323038]
15. Galvão LW, Oliveira LC, Díaz J, Kim D, Marchi N, van Dam J, Castilho RF, Chen M, Macaluso M. Effectiveness of female and male condoms in preventing exposure to semen during vaginal intercourse: a randomized trial. Contraception. 2005; 71:130–136. [PubMed: 15707563]
16. Van Devanter N, Gonzales V, Merzel C, Parikh NS, Celantano D, Greenberg J. Effect of an STD/HIV Behavioral Intervention on Women's Use of the Female Condom. Am J Public Health. 2002; 92:109–115. [PubMed: 11772772]
17. Calsyn DA, Hatch-Maillette MA, Tross T, Doyle SR, Crits-Christoph P, Song YS, Harrer JM, Lalos G, Berns SB. Motivational and Skills Training HIV/STI Sexual Risk Reduction Groups for Men. J Subst Abuse Treat. 2009; 37:138–150. [PubMed: 19150206]
18. Folstein MF, Folstein SE, McHugh PR. "Mini-Mental State": a practical method for grading cognitive state of patients for the clinician. J Psychiatric Res. 1975; 12:196–198.
19. Farris CA, Fenaughty AM, Lindemann DF. A condom scale: assessing condom skills among female drug users. Drug Educ. 2003; 33:217–231.

Table 1

Demographics: Analysis Sample with Responses to Male or Female CUS Scores

	Demonstration Only (*n* = 149)	**Demonstration and practice (*n* = 112)**	**No Sessions (*n* = 139)**
	Mean and (Standard Deviation)		
Age	40.62 (10.62)	41.34 (10.58)	38.29 (10.17)
Education in years	12.37 (1.98)	12.03 (1.69)	12.28 (2.07)
Monthly net income	373.48 (893.74)	581.06 (1369.33)	601.53 (1405.45)
	Percent		
Ethnicity			
White	57.72	57.14	56.83
Black	30.87	25.89	28.78
Hispanic	9.40	14.29	11.51
Amer. Indian	0.67	0.89	0.72
Asian	1.34	0.00	1.44
Other	0.00	1.79	0.72
Marital Status[a]			
Never married	42.95	48.21	48.92
Married	14.09	17.86	25.18
Divorced	21.48	19.64	14.39
Separated	17.45	11.61	8.63
Remarried	0.00	0.00	0.72
Widowed	4.03	2.68	2.16
Treatment modality [b]			
Methadone	58.39	64.29	48.20
Maintenance			

[a] More NS participants married compared to DO ($\chi^2_1 = 6.31$, p = .012)

[b] More NS participants in psychosocial outpatient compare to D+P ($\chi^2_1 = 6.49$, p = .011)

Table 2

Results of Mixed-effects Linear Regression Models

	Male Condom Use (*n* =400)			**Female Condom Use (*n*=386)**		
	df	***F***	***p* - value**	***df***	***F***	***p* - value**
Analysis of Baseline, Post-intervention, 3- and 6-months Follow-up						
Attendance Group	2,397	76.10	< .001	2,383	75.69	< .001
Time	3,1000	64.04	< .001	3,962	100.97	< .001
Group × Time	6,1000	14.12	< .001	6,962	13.26	< .001
Analysis of Post-intervention, 3- and 6-months Follow-up						
Attendance Group	2,397	107.94	< .0001	2,391	110.27	< .001
Time	2,603	0.17	0.845	2,593	0.05	0.953
Group × Time	4,603	1.91	0.107	4,593	1.37	0.241

Table 3

Least Squares Means from Mixed-effects Linear Regression Models

	Male Condom Use (*n* = 400)			Female Condom Use (*n* = 386)		
	Demo Only	**Demo + Practice**	**No Sessions**	**Demo Only**	**Demo + Practice**	**No Sessions**
Baseline	7.47	6.96	7.26	5.49	5.00	5.26
Post-Intervention	8.93	10.95	7.68	7.63	9.60	6.14
3-mo. FU	8.82	10.47	7.97	7.52	9.20	6.61
6-mo.FU	9.20	10.25	7.92	7.74	9.03	6.58

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Table 4

Percent correct based on observed values and p-values associated with repeated measures logistic regression analysis.

	Demo Only and No Sessions		**Demonstration and Practice**		
Items **Male Condom**	**Baseline (*n* = 288)**	**Post-Interv. (*n* = 253)**	**Baseline (*n* = 112)**	**Post-Interv. (*n* = 108)**	***p*-value**
1 Chose latex-	71.18	72.33	58.93	83.33	**<.001**
2 Chose water based	39.24	47.04	40.18	58.33	0.1497
3 Exp date checked	2.43	9.49	1.79	80.56	**<.001**
4 Package opened carefully	72.57	77.08	59.82	88.89	**<.001**
5 Checked for damage	7.29	15.02	6.25	45.37	**<.001**
6 Determined direction to roll	85.76	90.51	80.36	88.89	0.586
7 Rolled correctly downward	93.06	95.26	90.18	93.52	0.924
8 Rolled to base of penis model	94.79	95.65	90.18	98.15	0.058
9 Air removed	42.36	50.99	44.64	76.85	**<.001**
10 Space left at tip	62.15	75.89	56.25	89.91	**<.001**
11 Lubricant added	38.19	46.64	36.61	61.11	**0.029**
12 Moved away from model	46.18	54.55	57.14	65.74	0.897
13 Care to avoid spilling	54.51	66.40	57.14	90.74	**<.001**
14 Disposed in trash	24.04	41.50	16.96	74.07	**<.001**
Female Condom	(*n* = 280)	(*n* = 248)	(*n* = 106)	(*n* = 103)	
1 Exp date checked-	2.86	7.69	2.83	75.73	**0.002**
2 Package opened carefully	66.43	77.02	61.32	88.35	**0.004**
3 Checked for damage	2.86	8.06	0.00	46.60	*
4 Rings separated	75.71	87.50	73.58	94.17	0.060
5 Lubricant spread evenly	3.21	7.26	1.89	37.86	**0.002**
6 Squeezed inner ring for insertion	46.07	72.58	43.40	91.26	**<.001**
7 Inserted into vaginal canal, not twisted	53.57	79.03	54.172	94.17	**0.002**
8 Inner ring covered cervix-	42.50	70.16	42.45	91.26	**<.001**
9 Outer ring covered vagina opening	70.00	77.42	61.32	90.29	**<.001**

	Demo Only and No Sessions		Demonstration and Practice		
Items	**Baseline**	**Post-Interv.**	**Baseline**	**Post-Interv.**	***p*-value**
Male Condom	**(*n* = 288)**	**(*n* = 253)**	**(*n* = 112)**	**(*n* = 108)**	
10 Twist and remove, care to avoid spilling	21.43	40.32	17.92	62.14	**<.001**
11 Disposed in trash	83.21	93.15	79.25	98.06	**0.035**

* Note: Unable to obtain a viable solution with the repeated measures logistic regression analysis.