A novel, self-guided, home-based intervention to promote condom use among young men: a pilot study

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Abstract

Background: Current HIV prevention programs are often expensive to implement and require significant commitment on the part of participants and staff. These factors limit widespread implementation. Thus, there is an increasingly recognized need to develop and test brief interventions designed to promote safer sex.

Methods: This study tested the potential efficacy of a brief, self-guided, home-based intervention to promote consistent and correct condom use among young men by focusing on condom use skill, enjoyment, and self-efficacy. The central focus of The Kinsey Institute® Homework Intervention Strategy (KIHIS) is that men practice applying, using, and removing condoms alone (a ''low pressure'' situation) trying various condoms and lubricants. A repeated measures evaluation compared 2-week, 6-week ($n = 28$) and 4-month ($n = 17$) follow-up evaluations to baseline (pre-intervention).

Results: Despite the limited sample size, significant post-intervention improvement was found for condom use experiences, confidence in the ability to use condoms, self-efficacy for condom use, and condom comfort as well as a reduction in breakage and erection problems.

Conclusion: Our findings suggest that the KIHIS, with its inherent potential for easy translation to public health sexually transmitted infection (STI) clinics (requiring very little clinic resources), may have lasting and positive effects on subsequent condom use attitudes, skills, and behaviors. © 2011 WPMH GmbH. Published by Elsevier Ireland Ltd.

Introduction

More than 25 years into the AIDS pandemic, numerous HIV prevention programs have been developed for adolescents and young adults [1−3]. The prevailing paradigm of condom-use promotion programs focuses on knowledge and skills for condom use. This ''health promotion'' paradigm has produced mixed results and the often-intensive resource requirements have prohibited the translation of efficacy trials into practice [4]. Thus, there is

an increasing need to develop safer sex interventions. Recently, a single session intervention of less than 1-hour reduced sexually transmitted infection (STI) acquisition among young heterosexual males over a 6-month period [5]. Unfortunately, many clinics have inadequate staff for even that brief an intervention. Consequently, we developed a novel, self-guided, home-based program, requiring only a minimal introduction by a staff member, which is designed to promote consistent and correct condom use among young men by

focusing on condom-use skill, enjoyment, and self-efficacy.

The *Kinsey Institute*® *Homework Intervention Strategy (KIHIS)* requires a brief introduction with condom "homework assignments" as a central feature. The primary philosophy of the *KIHIS* is to place the impetus for change on the client by focusing on solitary behavioral practice of condom use skills. The model adopted is taken from the behavioral therapy approach most commonly used to treat sexual problems [6–8]. Some of the key barriers to condom use are related to sexual arousal, specifically, sensation decrease, erection difficulties, and condom fit-and-feel problems [9,10]. Previous interventions to increase correct and consistent condom use have insufficiently addressed these sexual difficulties. We hypothesized that helping men learn to experience greater sexual pleasure while using condoms would improve condom-related attitudes and enhance self-efficacy for consistent and correct use. Thus, we utilized proven sex therapy approaches [11,12] in developing this intervention.

Brief sex therapy and self-help therapies have long been the desired treatment for most sexual problems [6–8,13,14]. These approaches emphasize that clients be actively engaged with behavioral assignments (called "directed practice")[6], which are done at home. These exercises are designed to reduce "demand" by focusing on the giving and receiving of pleasure, rather than orgasm. The PLISSIT sex therapy model comprises four progressive aspects: permission, limited information, specific suggestions, and intensive therapy [15]. Sexual problems are often minimized using the first three levels [16], which are incorporated into the *KIHIS* intervention in the following ways: (1) permission is given by discussing the "normalcy" of condom use, thereby reducing embarrassment [17] and by encouraging the exploration of condoms; (2) limited information is provided on correct condom use, making condom use more pleasurable, and on the range of condoms available; and (3) specific suggestions regarding "homework" activities are made in which each participant practices using a variety of condoms and lubricants. In common with the sex therapy approach, the *KIHIS* program behavioral exercises are designed to increase an individual's focus on pleasurable sensations, in a "non-demand" situation without a partner present. Taking ample time and

becoming more familiar and comfortable with the touch/feel, smell, and sight of condoms is emphasized. Sexual arousal aspects of condom use are also emphasized.

This pilot study evaluated the home-based *KIHIS* intervention program to assess its acceptability. We hypothesized that the intervention would improve condom use experience, condom use ability, condom use self-efficacy and condom use consistency, while decreasing condom use errors and problems.

Methods

Study sample

A sample was recruited from a Planned Parenthood clinic in a large Canadian city ($n = 14$) and from a nearby university ($n = 18$). We aimed to recruit 30 men for this pilot study. Clinic recruitment involved solicitation (in person, electronic, and paper). University recruitment involved electronic recruitment (listserv) and classroom solicitation. In both settings, referral from enrolled participants was also used. Males, 16–21 years of age, who were able to read English, who had access to a computer and the internet in a private setting, who had used a condom for penile–vaginal intercourse (PVI) in the past 3 months, and who had used condoms three times or fewer out of the last five times they had PVI were eligible. The participant age was selected based on research indicating that young men of this age have higher STI risk [18]. Additionally, the clinic sample was targeted because this sample was more likely to be seeking STI information or treatment. The institutional research ethics board approved the study.

Intervention

Based on previous research and sex therapy approaches, the *KIHIS* was based on three premises: (1) self-practice of using condoms in a no pressure situation (low performance demand) could enhance condom-related skills and self-efficacy; (2) experimenting with a "smorgasbord" of condoms and lubricants would encourage young men to try various condoms and lubricants thereby helping them find the optimal condom "fit-and-feel;" and (3) encouraging men to focus on the physical sensations experienced while using condoms might diminish condom interference with sexual

arousal and thereby increase condom acceptability and correct use.

The intervention goal was to build men's condom-use self-efficacy. Self-efficacy has been demonstrated to be a key theoretical mediator in programs designed to promote condom use [19]. An effective way to build self-efficacy, in addition to providing an opportunity to practice the task, is to guide the client through the entire task process, one step at a time (known as "participant modeling"). Modeling and participant practice with a penile model were done during the initial visit. However, a novel *KIHIS* intervention feature is its inclusion of at-home practice instead of reliance on application to penis models only. This more closely approximates the "real life" situation in which condoms are applied – during sexual arousal and on one's own penis.

The intervention began by describing the purpose of the *KIHIS* study, i.e., to improve condom-use attitudes and skills in order to increase correct and consistent condom use. Men were also informed that the intervention was to provide an opportunity to determine which condoms fit-and-felt best, for them, and that this information would be passed on to health clinics so that favored condoms could be purchased for their clients. Participants were told that they were "condom testers". During the *KIHIS* introduction session the health educator explained that practice in a "low-pressure" situation and trying different condoms and lubricants could help men learn what they liked best and improve their enjoyment of condom use. The men were told that women would respect their desire and ability to "smoothly" and carefully apply the condom and that applying condoms can be a desirable and erotic part of foreplay and a way of expressing care for the partner.

Young men were provided with 18 condoms (3 each of 6 different condom types/brands) and lubricants arranged in a small portfolio case containing a condom-use instruction card (Figure 1). They were asked to practice with each condom alone (putting the condom on by themselves, stimulating themselves, discovering what felt good, continuing to orgasm if they wanted, and taking the condom off correctly afterwards) at least once during the next 2 weeks. Men were also encouraged to experiment with the various water-based lubricants. They were told they could place a small amount of lubricant inside the condom and then use a larger amount on the outside of the condom after it was applied. Lastly, they were shown how to correctly apply condoms using a penile model and were then asked to apply a condom to the model.

To help them focus on the sensation of using condoms, participants were asked to complete a condom rating scale within 24 hours of each condom-use event.

Procedures

A repeated measures study design with three follow-up assessments was employed.

Men who responded to the recruitment efforts completed a screening questionnaire online via email or in person. Those meeting selection criteria were scheduled to participate in the study at either the clinic or the university campus. At their appointment, participants were first given Informed Consent Statements and completed a baseline questionnaire (T1). Then, participants received more detailed information about the intervention, the condom kit and the instructions related to their practice sessions and the ratings scales. Correct condom application was modeled and

Figure 1 The *KIHIS* condom kit.

then practiced by participants. Participants were paid $20. For the next 2 weeks, participants received a nightly e-mail reminder to practice with the condoms and a link to the secure study website where they could complete the condom rating scales if they had practiced with a condom that day. Participants could opt to receive text message reminders. After 2 weeks, participants received a link for a follow-up questionnaire (T2). Men were paid $20 for completion of the T2 questionnaire and $5 for each rating scale they had submitted during the past 2 weeks. Four weeks later, or 6 weeks post the initial visit, men were sent an online link to the T3 questionnaire, and were paid $30 for completing it. We decided to re-contact men for a 4-month follow-up (T4) to assess condom-use consistency over the previous 2 week period and condom-use errors and problems for the last three condom-use events (these measures were not included at the T3 timepoint). Participants were offered lubricant packets and 30 of the highest rated condoms from the testing phase for participating at T4. We believed men would be curious to know which condom was the most preferred by the ''condom testers'' and would appreciate a small supply of this brand. If men participated in every study phase, they were eligible to receive $100 Canadian in Visa gift cards.

Measures

Three scale measures (Condom Use Experience subscale; Condom Use Ability subscale; Condom Use Self-Efficacy scale) and the Condom Use Errors/Problems Survey (CUES)[20] were collected at baseline (T1) and again at the 2-week (T2) and 6-week (T3) follow-up assessments. Condom-use frequency for the last 5 PVI events was assessed at baseline (T1) and at the 4-month follow-up assessment (T4) along with the CUES.

Condom Use Experience
This was assessed using the Condom Use Experience subscale from the Condom Barriers Scale [21,22], which assessed specific condom experiences via seven items: (1) condoms rub and cause irritation; (2) condoms do not feel good; (3) condoms interrupt the mood; (4) condoms feel unnatural; (5) condoms don't fit right; (6) ''I feel closer to my partner without a condom;''

and (7) condoms change the climax or orgasm. Response alternatives were 1 (strongly agree) to 5 (strongly disagree). The inter-item reliability coefficient for this subscale was $\alpha = 0.74$. Mean experience scores were calculated.

Condom Use Ability
This was assessed using a subscale created from 9 items (adapted from the Condom Use Self-Efficacy Scale [23]), chosen because it was hypothesized that these items would be affected by the KIHIS program. These were the ability to: (1) put condoms on; (2) maintain an erection when using a condom; (3) use a condom correctly; (4) gracefully remove a condom; (5) incorporate putting a condom on into foreplay; (6) put a condom on without breaking the sexual mood; (7) put a condom on quickly; (8) use a condom without reducing sensation; and (9) put the condom on myself in heat of passion. Response alternatives were 1 (strongly disagree) to 5 (strongly agree). The inter-item reliability coefficient for this subscale was $\alpha = 0.82$. Mean ability scores were calculated.

Condom Use Self-Efficacy
This was assessed using an 8-item measure of self-efficacy to apply condoms correctly [24,25], which asked how easy or difficult it would be to: (1) get really good condoms; (2) find condoms that fit properly; (3) put a condom on correctly; (4) keep a condom from drying out during sex; (5) keep a condom from breaking during sex; (6) keep an erection (stay hard) while using a condom; (7) keep a condom on while withdrawing; and (8) use a condom from start to finish of sex. Response alternatives were 1 (very difficult) to 5 (very easy). The inter-item reliability coefficient was $\alpha = 0.72$. Mean self-efficacy scores were calculated.

Condom Use Errors/Problems Survey
Fifteen items from the CUES [20] were assessed at T1 and T4. Items asked participants to identify how many times they engaged in a specific behaviour out of the last three times they used a condom (e.g. putting the condom on the wrong way and having to flip it over). For the last 3 times a condom was used, the items assessed: (1) breakage during sex, (2) slippage during sex, (3) slippage during withdrawal, (4) problems with fit and feel, (5) late application, (6) early removal, (7) condom contact with

sharp objects, (8) loss of erection while applying a condom, (9) loss of erection while wearing the condom during sex, (10) use of oil-based lubricant, (11) use of water-based lubricant, (12) checking condom for visual damage before having sex, (13) putting the condom on with the wrong side up and having to flip it over, (14) leaving space at the end of the condom when applying it, and (15) squeezing air out of the condom after putting it on.

Acceptability of the intervention

Acceptability among participants was assessed using open-ended follow-up questions at T3. Questions included: (1) What did you like about participating in the study?; (2) What would you suggest we change in the future?; (3) What do you think about asking guys to practice putting on condoms and masturbating into condoms to increase their condom use skills?; (4) Have you changed any of your opinions about condoms since you participated in the study?; and (5) Do you think your condom use skills have improved?

Data Analysis

Repeated measure comparison of three scale scores (experience, ability, and self-efficacy) across assessments were conducted using PASW Statistics 17 GLM repeated measure procedures. Specifically, three analyses were conducted (T1–T2, T1–T3, and T2–T3) to test pre–post intervention changes, and whether the intervention effects degraded significantly between T2 and T3. When the multivariate analyses were significant, univariate tests were examined for each scale. Additionally, a new dichotomized variable was created from each of the T1 scale scores based on a median-split that classified individuals as initially scoring low or high on that measure. This was then examined to see whether those initially

scoring low or high significantly differed in the degree of change for each scale measure between T1 and T3. This was done using a t-test comparing the T3–T1 differences in scores for the high and low groups for each of the three scales (experience, ability, self-efficacy).

Wilcoxon tests were used to analyze changes in dichotomous-level outcome variables from the CUES and for unprotected intercourse. It was hypothesized that scores would improve post-intervention (T2 and T3) compared to baseline (T1) for the experience, ability and self-efficacy scales. It was also hypothesized that there would be an improvement in the condom use variables assessed by the CUES and an increase in condom-protected PVI events. Given the directional nature of the hypotheses, the exploratory nature of this study, and the limited sample size, significance was defined by an α value of 0.10 for the reported P values, which are for two-tailed tests.

Results

Characteristics of the sample

Participants were self-identified heterosexuals aged 18–21 years (mean = 19.62, standard deviation (SD) = 1.31). All but three participants were White. Most (62.5%) were seriously dating one person, 12.5% were casually dating one person, and 6.3% were casually dating more than one person. A minority (15.6%) were not dating anyone or living with their partner (3.1%). Of the 32 participants enrolled at baseline (T1), 28 (87.5%) completed the 6-week follow-up assessment (T3).

Repeated measures analysis

Table 1 shows the mean group scores for T1, T2, and T3, as well as the mean paired differ-

Table 1 Groups mean (SD) for condom use experience, ability, and self-efficacy scale scores at T1, T2, T3, and mean paired difference scores for T2–T1, T3–T1, T3–T2 for each scale.

| Variable | Mean (SD) | | | | | |
	T1	T2	T3	T2–T1*	T3–T1*	T3–T2
Condom-use experiences	2.41 (0.64)	2.71 (0.64)	2.70 (0.69)	0.27 (0.52)*	0.24 (0.66)	0.06 (0.45)
Confidence in the ability to use condoms	3.41 (0.71)	3.62 (0.67)	3.71 (0.76)	0.27 (0.60)*	0.29 (0.67)*	0.04 (0.40)
Self-efficacy for condom use	3.69 (0.63)	3.93 (0.47)	4.03 (0.58)	0.27 (0.55)*	0.31 (0.68)*	0.05 (0.46)

SD, standard deviation.

* Repeated measures multivariate analyses for T2–T1 and T3–T1 were significant at $P < 0.05$, therefore univariate post-hoc P-values are presented.

ence scores (T2–T1, T3–T1, and T3–T2) for the experience, ability, and self-efficacy scores. Repeated measures multivariate analysis for the T2–T1 comparisons found significantly increased scores following the intervention ($F(3,25) = 3.087$, $P = 0.045$). For each measure, univariate analyses were statistically significant (experience $F(1,27) = 7.405$, $P = 0.011$; ability $F(1,27) = 5.749$, $P = 0.024$; self-efficacy $F(1,27) = 6.718$, $P = 0.015$). The repeated measure multivariate analysis for T3–T1, was also significant ($F(3,23) = 3.767$, $P = 0.025$). The univariate analyses for this time period were also statistically significant (experience $F(1,28) = 3.941$, $P = 0.057$; ability $F(1,28) = 5.445$ $P = 0.027$; self-efficacy $F(1,28) = 6.032$, $P = 0.021$). Scores for the scale measures were similar at T2 and T3 ($F(3,24) = 0.596$, $P = 0.624$).

Lower baseline scores for experience were associated with significantly greater post-intervention improvement in experience scores. Compared to those with higher pre-intervention (T1) experience scores ($n = 14$, mean (M) = -0.12, SD = 0.35), those with lower scores ($n = 15$, M = 0.59, SD = 0.71) showed significantly greater improvement in experience scores at T3 ($t = 3.367$, degrees of freedom (df) = 27, $P = 0.002$). Those with lower ability scores at T1 ($n = 15$, M = 0.53, SD = 0.74) showed significantly greater improvement in ability scores at T3 ($n = 14$, M = 0.04, SD = 0.49), than did those with higher initial scores ($t = 2.094$, df = 27, $P = 0.046$). Finally, those with lower self-efficacy scores at T1 ($n = 12$, M = 0.71, SD = 0.78), showed greater improvement in self-efficacy scores at T3 than those with higher pre-intervention scores ($n = 17$, M = 0.03, SD = 0.43) ($t = 3.015$, df = 27, $P = 0.006$).

Several findings from the CUES are noteworthy. For example, significant ($P = 0.01$)

improvement was found in young men's reports of whether they experienced problems with the fit-and-feel of condoms during the last three times condoms were used. Of the 28 men followed to T3, eight who had initially reported problems with fit-and-feel did not do so at T3. Only one young man reporting "no" fit-and-feel problems at T1 reported these problems at T3. All others showed no change on this variable. Similarly, 14 men who had initially reported that they did not add water-based lubricants to condoms subsequently reported that they had done so at T3. Only one young man who reported at T1 that he did add water-based lubricants subsequently reported not engaging in this practice at T3 (again, the remaining participants showed no change). The difference was significant at $P < 0.001$. Significant ($P = 0.03$) improvement was also found in young men's reports of whether they experienced erection problems while using condoms. Six who had initially reported erection problems subsequently (at T3) did not describe this problem. Only one young man who did not have erection problems at T1 subsequently reported the problem at T3 (there was no change on this variable for the remaining participants).

Although it was not part of the original recruitment to the study, 17 men completed the T4 assessment when re-contacted. A comparison of those who did, and did not, participate in T4 showed no significant difference on baseline measures of Condom Use Experience, Condom Use Ability and Condom Use Self-Efficacy, nor did they differ in age or number of current sexual partners (see Table 2). Although the small sample size at T4 limited ability to test a hypothesis about an increase in condom use, there was an obtained medium effect size

Table 2 Comparison of men who did and did not participate at T4 on key baseline (T1) measures.

Variable	Mean (SD)		*T* (df)
	Men who participated at T4 (N = 17)	Men who did not participate at T4 (N = 15)	
Condom-use experiences	2.33 (0.70)	2.50 (0.59)	0.73 (30)
Confidence in the ability to use condoms	3.32 (0.76)	3.50 (0.66)	0.70 (30)
Self-efficacy for condom use	3.67 (0.70)	3.72 (0.57)	0.21 (30)
Age	19.88 (1.27)	19.33 (1.35)	−1.19 (30)
Current number of sex partners	0.94 (0.24)	1.07 (0.59)	0.80 (30)

All P-values greater than 0.02. Comparisons between men who did and did not participate at T4 and at T2 and T3 on condom use experiences, ability and self-efficacy were not significant with one exception: those who did complete T4 had significantly lower self-efficacy for condom use than those who did not complete T4 ($P = 0.02$).

(0.5 < d < 0.8)[26]. At T1, none of the participants had used a condom on more than 3 of the last 5 times they had had vaginal intercourse, at the T4 follow-up, five men (29.4%) had used condoms 4–5 times out of the last 5 intercourse events. Further, three men reporting breakage at T1 did not report breakage at T4 and none of those previously reporting a lack of breakage reported the problem at T4 (*P* = 0.04).

Acceptability of the intervention

Participant feedback indicated that most enjoyed participating and that they liked learning about condom fit-and-feel as a way to improve their sexual experience. Some men commented that they had now found a condom they liked best and would continue to use it. Comments included:

"I feel more confident in my condom usage."
"I know my condom skills have improved, and I think that I have learned a lot about the importance of condoms in sexual activity."
"The study enlightened my knowledge of condoms and techniques, which made me less turned off from them."
"It [KIHIS] may sound awkward at first, but it really helps making a condom feel more 'natural' during sex."
"Good idea, don't want people choking at game time."
"Liked the ability to test out different condoms and find one that fits properly."

Discussion

This is the first report of a self-guided, home-based, condom-use promotion intervention. A central intervention focus was the "prescription" for individual practice designed to enhance condom-use skills, comfort, and confidence where the performance pressure inherent in partnered-sex was absent. Men were provided with brief instructions on correct condom use and the opportunity to use a variety of condoms and lubricants to allow them to discover the optimal condoms for their needs while focusing on sexual arousal. We found significant improvement in condom-use experiences, confidence in the ability to use condoms, self-efficacy for condom use, and condom comfort (fit-and-feel), and reduction in important types of condom problems (e.g. breakage, erection problems). The intervention effect on experience, ability, and self-efficacy appeared to be stable from the immediate post-intervention assessment through the end of the following month. These changes appeared to be long-lasting and were maintained at the 4 month follow-up. Furthermore, those with lower pre-intervention scores on condom use experience, confidence in the ability to use condoms, and self-efficacy for condom use showed greater improvement in these scores after the intervention as compared to those with higher pre-intervention scores. This may indicate that the KIHIS has greater impact on men with more negative condom attitudes and lower condom-use self-efficacy. The effect sizes observed were generally medium to large and statistically significant, despite the small sample size. These results indicate that the PLISSIT Model is a useful guide for developing interventions that aim to improve condom use skills in young men. Men were given permission to explore a variety of condoms and many indicated that they had found a condom that they were likely to continue to use in the future. Additionally, giving limited information on correct condom use and specific suggestions regarding homework activities resulted in a decrease in condom-use problems and increased condom use self-efficacy.

Feedback on the acceptability of the intervention suggested that men found participating valuable, interesting and enjoyable. The intervention also made sense to them as a way to make one better at using condoms.

Study limitations include the small sample size, no control group, a volunteer sample, and no biological outcome measure. This study is further limited by the lack of behavioral measures at the T3 follow-up. Hence, it was not possible to report the proportion of condom-protected events at 4 weeks post-intervention. Although this data was collected at T4, 4 months past intervention, fewer men participated then. This is a significant limitation. It is believed that this was due to the fact that this additional survey was not a part of the original protocol and was thus unanticipated by participants. Furthermore, a minority of men could not be contacted as their email address and/or

phone number had changed. However, there were no differences between men who participated and men who did not at baseline, and only one significant difference at T2 and T3 (indicating those who did not complete T4 had higher self-efficacy to use condoms than those who did complete T4). Future research will test the efficacy of the *KIHIS* in larger, more diverse samples of men and evaluate new delivery approaches.

Despite the small sample size, the findings imply that this very brief, self-guided, home-based intervention designed for young men may have helpful and lasting effects on condom-use attitudes, skills, and behaviors. Because program delivery involved very little staff time and resources, widespread translation and dissemination of this intervention is clearly feasible. Hence, *KIHIS* has the potential to assist public health efforts focusing on the prevention of STI/HIV transmission and acquisition.

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