Assessing acceptability and perceptions of a novel condom use intervention for young women.

Lauren B. Towler and Cynthia A. Graham

Department of Psychology

University of Southampton

*Author Note*

Lauren B. Towler, MSc., Department of Psychology, University of Southampton; Cynthia A. Graham, PhD., Department of Psychology, University of Southampton.

Correspondence concerning this article should be addressed to Lauren Towler, Department of Psychology, University of Southampton, Hampshire SO17 1BJ. Email: lbt1g14@soton.ac.uk

**ABSTRACT**

**Objectives:** To assess the acceptability of a novel condom use intervention for women, the Home-based Exercises of Responsible Sex, that focuses on condom use experience, application skills, and self-efficacy.

**Method:** 280 women (*M age* 22.63, *SD* = 3.65) completed an online survey containing questions on condom use errors, experiences, ability, and self-efficacy, and on intervention acceptability.

**Results:** 81% reported that the intervention was acceptable. Significant positive predictors of acceptability were condom use ability (*β* = .18) and self-efficacy (*β =* .20).

**Discussion:** Findings suggest that the intervention is acceptable and that different options for completing the intervention should be offered.

Public health policy has become increasingly concerned with sexually transmitted infections (STIs) in recent years, particularly for the young adult population. Rates of STIs in the United Kingdom (U.K.) have increased by 49% over the last decade, with those aged 16-24 at the highest risk (Department of Health, 2013). The current estimated cost of STI treatment to NHS is £620 million per year (FPA, 2013). The U.K. Department of Health (2013) has suggested that the development and implementation of preventative interventions be prioritised to tackle this issue.

Condoms are the most effective method of STI and HIV prevention (UNAIDS, 2009). Despite this, condom use rates for men and women remain low. In a national sample of U.S. adolescents and adults, 21.5% of men and 18.4% of women reported condom use over the previous 10 instances of vaginal intercourse, and only 25.8% of men and 13.2% of women reported condom use in the past 10 anal intercourse instances (Reece et al., 2010). One study suggested that only one third of women who reported having both vaginal and anal sex used a condom for both events, with half reporting that they did not use a condom at all (Gorbach et al., 2014).

The Kinsey Institute Homework Intervention Strategy (KIHIS) is a novel, home-based intervention which aims to increase condom application skill, enjoyment, and self-efficacy, as well as reduce common condom errors and problems, among men. Participants are given a short condom application demonstration by a healthcare professional, and supplied with a “condom kit” containing a variety of types, brands and sizes of condoms and lubricants. Men are subsequently asked to practice using condoms in a low pressure situation (alone). The intervention does not just encourage consistent and correct condom use, but utilizes the principles of successful sex therapy approaches, such as the PLISSIT (Permission, Limited Information, Specific Suggestions, and Intensive Therapy; Annon, 1978) in order to enhance enjoyment of condoms, reduce embarrassment, and encourage exploration.

The efficacy of the KIHIS intervention has been evaluated in two pilot studies. The first was a Canadian study involving young men who have sex with women (Milhausen et al., 2011). A total of 32 participants completed the intervention procedure and were asked to rate the condoms they used online within 24 hours of each separate event. Participants were then invited to complete a follow-up questionnaire at two weeks, four weeks, and four months post-intervention. Statistically significant improvements were found for condom use skills, enjoyment and self-efficacy as well as a reduction in condom errors and problems at every time point (Milhausen et al., 2011).

The second pilot study involved 30 young men who have sex with men (MSM, Emetu et al., 2014). The intervention procedure was very similar, although this study included assessment of motivation to use condoms as well as a post-intervention interview that assessed acceptability. Motivation to use condoms in the future was significantly improved. The intervention feedback at interview was very positive, with 83% agreeing that the intervention was a good idea. Participants praised the user-friendly web-based system for submitting condom ratings and suggested that there should be more focus on lubricants in future interventions.

The current research focuses on the initial acceptability and feasibility of the Home-based Exercises of Responsible Sex (HERS), prior to initial trials to evaluate its efficacy. The HERS is an adapted version of the KIHIS for women, and thus the core principles of the intervention are the same as the KIHIS. Women participating in the intervention are given a variety of condoms and lubricants, and asked to apply these to a penile model or a partner and use them during masturbation/intercourse. Women are encouraged to focus on the smell, touch, and feel of condoms in order to discover which condoms they find the most pleasurable and which suit them best, as they were in the KIHIS pilot studies.

**Common Issues with Consistent and Correct Condom Use**

Most STI prevention strategies have focused on condom use consistency (Sanders et al., 2012; Warner, Stone, Macaluso, Beuhler, & Austin, 2006). However, condoms are not always used correctly (Crosby, Sanders, Yarber, Graham, & Dodge, 2002) and therefore research which assesses only consistent use may underestimate the risks of incorrect use. Research suggests that many factors are associated with incorrect or inconsistent use of condoms e.g., fit and feel of condoms, condom-associated erection loss and some of these factors have not been addressed by previous prevention strategies. Research on condom use errors and problems (Crosby, Sanders, Yarber, & Graham, 2003), and fit and feel (Crosby, Graham, Yarber, & Sanders, 2004; Crosby, Yarber, Graham, & Sanders, 2010), reveal the prevalence of these issues.

Condom errors have been defined as issues which are predictors of condom failure, such as allowing the condom to come into contact with sharp objects, incorrect storage, and incomplete condom use i.e., late application and early removal (Crosby et al., 2003; Spruyt et al., 1998). Condom use problems include loss of erection, condom breakage, and slippage. In one survey of 260 male and female undergraduates, condom use errors such as using sharp instruments to open condom packages (reported by 11% of the sample), and storing condoms in wallets (19%), were the most commonly reported issues (Crosby et al., 2003).

Qualitative research with men on potential reasons for condom failure has revealed issues pertaining to the “fit and feel” of condoms. These included tightly fitting condoms or condoms drying out during intercourse, which may lead to loss of sensation and breakage (Crosby et al., 2004). Research suggests that poorly fitting condoms are a prevalent issue. In one study, 44.7 % of men aged 18-67 years reported poorly fitting condoms, and these men were more likely to report condom breakage (adjusted odds ratio (AOR) = 2.6), slippage (AOR = 2.7), and difficulty reaching orgasm for both the female partner (AOR = 1.6) and themselves (AOR = 2.3; Crosby, Yarber, Graham, & Sanders, 2010). In another study of 820 men comparing rates of common condom use issues between men who used properly fitting condoms and those who used standard sizes, instances of breakage were significantly less likely in men who used fitted condoms (0.7% versus 1.4%; Reece et al., 2008). However, instances of slippage were significantly more likely for men using fitted condoms within the medium penis length category (1.9% versus 0.9%) and circumference category (2.2% versus 0.7%) (Reece et al., 2008). Men also report that they dislike using condoms because of these problems (Flood, 2003; Khan, Hudson-Rodd, Saggers, Bhuiyan, & Bhuiya, 2004).

There is evidence that women have similar condom use experiences to men, and they also report experiencing some unique issues not reported by men. For example, some women report that condoms can “break the mood” because they interfere with arousal and pleasure (Fennell, 2014; Graham, Sanders, Milhausen, & McBride, 2004). Furthermore, some women report experiencing pain, irritation, and discomfort when using condoms (Crosby, Yarber, Sanders, & Graham, 2005; Crosby, Graham, Yarber, & Sanders, 2010; Fennell, 2014). One study suggested that men were 2.6 times more likely to report that the condom irritated their partner’s vagina when condom application was rushed (Crosby et al., 2010).

It has been suggested that interventions which focus on improving pleasure may ameliorate these issues in both men and women by increasing positive experiences when using condoms, whilst additionally increasing an intervention’s efficacy and adherence rates (Philpott, Knerr, & Maher, 2006). Some programmes have focused on eliminating messages which promote shame and fear about sex and pleasure (Philpott, Knerr, & Boydell, 2006), but overall, few condom intervention programmes have focused on increasing pleasure during condom-protected sex. The KIHIS and HERS interventions attempt to increase consistent and correct condom use by decreasing the likelihood of common condom use issues and enhancing pleasure and enjoyment when using condoms.

**The Importance of Female-Directed Interventions**

Thus far, research into condom use has tended to focus on male issues with condoms (Crosby et al., 2007, 2008, 2010). However, as discussed above, studies suggest that women also experience similar problems with condoms and thus, it is important that interventions address women’s issues and negative experiences when using condoms. One study showed that women had more negative perceptions of condoms than men; for example, women were more than twice as likely to report that condoms cause irritation than men (estimated odds ratio (EOR) = 2.72; Crosby et al., 2013). Women were more than three times more likely (EOR = 3.23) than men to say that they would not use condoms. Furthermore, even when condoms *are* used, they may not be used correctly or throughout sexual activity. In one study of college-aged women, many reported incomplete condom use, with 51% applying after sex had begun and 15% removing the condom before sex had finished on at least one occasion (Sanders, Graham, Yarber, & Crosby, 2003). Rushed condom application can lead to higher chances of condom use error and problems for both men and women, including breakage and slippage (EOR = 1.90 and EOR = 1,86, Crosby et al., 2014). Moreover, women as well as men experience irritation and arousal problems when using condoms (Fennell, 2014). In fact, one study reported that arousal loss due to condoms was more strongly associated with unprotected sex in women than men (Higgins, Tanner, & Janssen 2009), further highlighting the need for more “sex positive” intervention strategies.

In addition to issues with fit and feel and arousal, there is evidence to suggest women are also applying condoms on their male partners instead of relying solely on the partner. In a college sample of 533 women, 31.7% of the condom users reported applying the condom to their male partners on at least one occasion (Sanders et al., 2006). Another reason, therefore, for interventions to target women is because women are performing or participating in their application. Finally, a man’s unilateral decision to use condoms has been associated with increased odds of removing the condom before sex ends (AOR = 2.51), breakage (AOR = 3.90), and slippage (AOR = 2.04), suggesting that a couple’s mutual decision to use a condom may reduce incidence of errors and problems (Crosby, Milhausen, Sanders, Graham, & Yarber, 2008). Attention to women in condom interventions (regardless of which partner puts the condom on) could therefore reduce errors and problems.

Research which has linked arousal loss and rushed condom application to condom use errors and problems such as breakage and incomplete use suggest that these issues could be prevented by helping individuals to increase their self-efficacy when using condoms, improve their condom use skills, and enhance their enjoyment of condoms (Crosby et al, 2010; Graham, Crosby, Milhausen, Sanders, & Yarber, 2011). Most interventions do not emphasise condom issues and barriers, and instead tend to focus on reducing risk-taking and increasing motivation to use condoms (National Institute for Health and Clinical Excellence, 2007). Moreover, the few interventions which have addressed condom problems and barriers have focused on men, and have not addressed women’s issues (Emetu et al., 2014; Milhausen et al., 2011).

Some interventions which have focused on women, however, have had encouraging results. Community-based interventions have successfully increased condom use, positive attitudes towards condoms and sexuality, increased sexual assertiveness, and self-efficacy when using condoms for up to six months post-intervention (Bryan, Aiken, & West, 1996; DiClemente & Wingood, 1995). A programme which aimed to reduce low income, African American women’s risk of STIs successfully improved condom usage rates up to a year post-intervention (St. Lawrence, Wilson, Eldridge, Brasfield, & O’Bannon, 2001). Women also showed improvement in their condom knowledge, attitudes, partner negotiation and condom application skills. Another intervention which aimed to reduce incidence of non-viral STIs in African-American women over a 12-month period successfully decreased women’s likelihood of being diagnosed with STIs, and of reporting multiple sexual partners, and increased women’s likelihood of using a condom during oral sex (Wingood et al., 2013). However, as previously discussed, consistent condom use does not necessarily beget correct use. These interventions focused on improving women’s negotiation skills, attitudes, and condom use consistency and did not address common condom use errors and problems. Wingood and DiClemente (2000) reviewed several HIV interventions, none of which investigated improvements in condom use errors and problems as an outcome.

The HERS intervention recognises that women also experience problems with condoms and that women have agency in situations involving condom use. The intervention aims to empower women to use, and become more skilled at using, condoms and to improve overall condom use experience. To date, the efficacy of the HERS has not been evaluated.

**Aims of the current research**

Before the efficacy of the HERS intervention is evaluated in a trial, acceptability of the intervention and potential participants’ opinions of the procedure needs to be established so that we can tailor the intervention to women effectively. The current study focuses on what young women think about the concept of the HERS intervention, its proposed procedures, and whether they would be willing to take part in a future study evaluating the intervention. Establishing acceptability of an intervention is an integral yet often under-emphasised process when designing interventions (Craig et al., 2008) and assessing this through implementation of pilot studies allows researchers to establish whether research protocols are realistic (van Teijlingen & Hundley, 2002).

Additionally, we aimed to assess how condom use attitudes such as self-efficacy and experiences relate to participants’ views of the intervention, to ensure the intervention captures those who could benefit the most from participating. For example, if those with lower condom use ability and more negative experiences rate the intervention as less acceptable, then special efforts could be taken at recruitment in order to encourage these women to participate. Finally, we aimed to assess the impact of these attitudes on experiences of condom use errors and problems. In the original KIHIS evaluation, condom use errors and problems decreased as condom use attitudes improved (Milhausen et al., 2011). It is important to test whether there is a similar relationship between condom use attitudes and condom use errors and problems in a female sample, to gain some insight into the potential efficacy of the intervention to women.

A sample of women aged 18-30 were recruited as this age group is at the highest risk of STIs (Department of Health, 2013). The key research questions were:

* Do young women think that the HERS is acceptable?
* How do condom use experiences, condom use self-efficacy, condom use ability, and experiences of errors and problems relate to acceptability of the intervention?
* Are women with more negative condom use attitudes, lower condom use self-efficacy, and lower condom use ability more likely to report errors and problems?

**METHOD**

**Participants**

Inclusion criteria were women aged 18-30 years who had prior experience of using male condoms. Participants were recruited through the University of BLINDED FOR PEER REVIEW psychology subject pool, social media and posters around campus and in a small number of sexual health clinics in the local area.

**Measures**

Participants were first asked a set of demographic questions on age, gender, relationship status, sexual experience, and sexual orientation. The frequency of sexual activity over the previous 3 months, how often they used a condom, and how often they applied the condom were also assessed. Participants were next presented with the 16-item Women’s Condom Use Errors/Problems Survey (W-CUES) to establish how often they experienced various issues the last three times they had condom-protected sex (Crosby, Graham, Milhausen, Sanders, & Yarber, 2010). Sample items were breakage and early removal. A “not applicable: I did not apply the condom” option was added to three of the items as women who did not apply condoms to their male partners were also included in the study. An “unsure” option was added to item 15, which pertained to their partners’ perception of condom fit and feel.

Three subscales were then completed from the original KIHIS research: the Condom Use Experience, the Condom Use Ability, and the Condom Use Self-Efficacy subscale (Milhausen et al., 2011). In the first KIHIS pilot study (Milhausen et al., 2011), the Condom use experience subscale (e.g., condoms rub and cause irritation) had a Cronbach’s alpha of α = .74, condom use ability (e.g., ability to use a condom correctly) α = .82, and condom use self-efficacy (e.g., how easy or difficult would it be to put a condom on correctly) α = .72. For the current study three items were removed because they were not relevant to women (items 2 and 4 of the Condom Use Ability subscale, and item 6 of the Condom Use Self-Efficacy subscale); for example, “how easy or difficult it would be to keep an erection (stay hard).” Item 7 in the Condom Use Self-Efficacy scale was adapted to “how easy or difficult would it be to keep a condom on while partner is withdrawing” to make it relevant to women. Responses on all three subscales were made on a 5-point Likert scale ranging from 1 to 5, 1 being “strongly agree” for Condom Use Experience, “strongly disagree” for Condom Use Ability, and “very difficult” for Condom Use Self-Efficacy.

The acceptability of the intervention was assessed using a 4-item acceptability scale (Miranda et al., 2013). Participants were given a short summary of the aims and procedure of the intervention, and then presented with the scale, which contained items asking participants to rate the appropriateness and suitability of the intervention as well as their willingness to take part in the intervention on a 4-point Likert scale ranging from 0 (e.g., “not at all appropriate”) to 4 (e.g., “very much willing”). High scores represent a positive evaluation of the intervention. The reliability of this measure was α =.79 in the current study.

Additionally, 6 open-ended questions from Milhausen et al. (2011) were presented to further assess acceptability. Items 3 and 4 of the qualitative open-ended questions used in the original KIHIS research were adapted to be appropriate for women in the current study. For example, item 3 was previously “What do you think about asking guys to practice putting on condoms and masturbating into condoms to increase their condom use skills?” This was changed to “What do you think about asking women to use the condom kit with their partner or on a dildo (or both)?”

**Procedure**

Participants completed the survey online via iSurvey; the survey took approximately 15-25 minutes. Women were presented with an information sheet describing the study and a consent statement on the first screen. Once consent was given, each participant was presented with the questionnaire. Following this, participants were fully debriefed and thanked for their time. Ethical approval was obtained from the BLINDED FOR PEER REVIEW.

**Data analysis**

Descriptive statistics were first obtained to report the demographic characteristics of the sample and to assess the percentage of the sample who rated the intervention as acceptable. Two forced entry multiple linear regression analyses were conducted in order to identify which factors predicted the acceptability of the intervention and experiences of condom errors and problems.

Participants’ responses to the six qualitative questions were read through by the first author to identify categories. Responses were then assessed a second time by the first author in order to tally each participant’s response into one or more of these categories in order to identify the most common categories. The categories were reviewed and cross-validated by the second author, and agreement was reached on the final categories. Participants’ responses to the open-ended questions were assessed in a separate spreadsheet, in order to blind the researchers to the attributes of the participants.

**RESULTS**

**Sample Characteristics**

In total, 293 women completed the survey. Of these completed surveys, nine cases were excluded on the basis of missing data, and a further four were excluded because the data were from male respondents. Participants had a mean age of 22.63 years (*SD* = 3.65) and reported a mean of 20.67 sexual encounters (*SD* = 24.08) over the previous three months. Table 1 contains information on participants’ relationship status, sexual orientation, condom use frequency and condom application frequency. The majority of the sample self-identified as being in a relationship, heterosexual, always using a condom, and never applying the condom themselves. The demographic characteristics of the sample were similar to the nationally representative samples collected as part of the third U.K. National Survey of Sexual Attitudes and Lifestyles (Natsal-3, 2013) in terms of sexual orientation, condom use, and sexual intercourse frequency. However, it is worth noting that the age ranges and measurements used in the current sample differ slightly from the national data. For example, 75% of women aged 16-24 and 82% of women aged 25-34 reported a history of sexual experiences exclusively with men in Natsal-3, compared with 77% of women aged 18-30 identifying as heterosexual in the current sample.

**Acceptability of the HERS Intervention**

To assess the acceptability of the HERS intervention, scores across the 4 acceptability questions were totalled and categorised into high, neutral, and low categories. A total score of 8 out of a possible 16 was classified as neutral, a score of 0-7 as low acceptability, and a score of 9-16 as high acceptability. As Table 2 shows, 80.7% of participants indicated that the intervention had high acceptability and 12.9% felt that it had low acceptability (*M* = 11.05, *SD* = 3.06). Figure 1 shows that no participants gave the intervention an acceptability score of 2 or lower, while 36 participants gave the intervention a score of 15 or higher.

**Associations between the W-CUES, Condom Use Experiences, Ability, and Self-Efficacy and Acceptability**

A multiple linear regression analysis was conducted to investigate whether condom use errors and problems (W-CUES; *M* = 10.25, *SD* = 4.35), experiences (*M* = 10.90, *SD* = 6.56), ability (*M* = 21.94, *SD* = 5.88) and self-efficacy (*M* = 26.66, *SD* = 4.86) predicted the perceived acceptability of the intervention. The sample size (*N* = 280) was more than adequately powered according to a priori analyses conducted prior to recruitment in G\*Power (Faul, Erdfelder, Buchner, & Lang, 2009). This analysis indicated that a minimum of 103 participants would be needed to achieve satisfactory power (0.8) when a medium effect size is achieved. For our regression analysis, effect size refers to the proportion of the variation in the dependent variable accounted for by the independent variables. An expected medium effect size would mean that the dependent variable scores increase by at least .13 standard deviations for every standard deviation increase in the independent variables. A significance level of less than 0.05 was used to calculate the power analysis.

The predictor variables were entered into block 1 and applied to the outcome variable via the forced entry method. The effect size of the model was small (Total *R2*= .10, Adjusted *R2* =.08), with the model accounting for 10% of the variance in acceptability scores. Table 3 displays coefficient statistics and significance levels of the variables within the model. Acceptability of the intervention was predicted by condom use ability and self-efficacy, but not by condom use experiences or by errors and problems.

**Associations between Condom Use Experiences, Ability, and Self-Efficacy and W-CUES scores**

A second regression was conducted to assess whether condom use experiences, ability, and self-efficacy predicted scores on the W-CUES scale. All predictors were entered into the model via the forced entry method. The effect size was medium (Total *R2*= .28, Adjusted *R2* = .28), with the final model accounting for 28% of the variance in W-CUES scores. Table 3 displays the coefficient statistics and significance levels of the variables within the model. W-CUES scores were predicted by condom use experiences and condom use ability, but not by condom use self-efficacy.

**Acceptability: Open-ended Questions**

Women’s responses to the six open ended questions were grouped into categories. Participants who did not respond, those who gave clearly irrelevant answers, or responses whose meaning was difficult to decipher e.g., responses such as “I don’t understand” were excluded. For questions 1-4, some participants provided responses that could be included in more than one category and therefore the totals reflect the number of comments made. For example, participants may have commented both on the focus on pleasure and the large variety of condoms and lubricants offered.

**What do you like about the study?** A total of 21 different categories were identified from participants’ responses to this question. The majority (*N* = 54, 19%) of women indicated that they liked the large variety of condoms and lubricants provided, with the next most frequent comments that they felt that the intervention placed good focus on women’s abilities (*N* = 30, 10%) and pleasure (*N* = 28, 10%).

**What would you suggest we change about the programme?** A total of 19 categories were identified from participants’ responses to this question. The majority of women indicated that they would not change anything, or had no suggestions to improve the intervention (*N* = 70, 40%). The most frequent suggestions included making it an online intervention to reduce inconvenience and embarrassment (*N* = 23, 13%), and including women’s partners in the intervention (*N* = 17, 10%).

**What do you think about asking women to get used to the sight, smell, and feel of a condom?** A total of 16 categories were identified from participants’ responses to this question. The majority of women gave general positive comments (*N* = 88, 36%; for example “I think this is a good idea”). The second most popular category included comments pertaining to increasing familiarity and confidence with condoms, and enabling condoms to become a “natural” part of sex (*N* = 60, 24%).

**What do you think about asking women to use the condom kit with their partner or on a dildo (or both)?** A total of eight categories were identified from participants’ responses to this question. The majority of women felt that it would be best to offer women the option of both so they can choose which option is best for them (*N* = 186, 75%). For example, one participant commented: “Great to provide the option of with a partner or without. Not everyone may have a partner, but it still allows them to become familiar with condoms for when they do have one”. The second most frequently endorsed category included comments pertaining to a preference for being asked to use the condom kit on a partner (*N* = 21, 8%).

**Do you think taking part in the programme would change your opinions about condoms?** A total of six categories were identified from participants’ responses to this question. The largest percentage of women felt that their opinions would not change after taking part in the intervention (*N* = 76, 29%), although fairly similar proportions reported that their opinions would change (*N* = 68, 26%) or that they might possibly change (*N* = 60, 23%).

**Do you think your condom use skills would improve on this programme?** A total of four categories were identified from participants’ responses to this question. The majority of participants indicated that they felt their condom use skills would improve after taking part in the intervention (N = 187, 72%), and 39 women (15%) felt their skills might potentially change.

**DISCUSSION**

The aim of the current research was to assess acceptability of a new condom intervention targeted at young women prior to conducting research to establish its effectiveness. The objectives were threefold: to evaluate whether women rated the intervention as acceptable, to assess whether condom use errors and problems, experiences, ability to use condoms, and condom use self-efficacy predicted reported acceptability of the intervention, and to test whether condom use experiences, ability, and self-efficacy predicted condom use errors and problems.

**Survey Outcomes and Implications**

Approximately 80% of the young women in our sample rated the intervention as acceptable, with only 12.9 % indicating that the intervention was not acceptable. This finding is congruent with the results of the initial KIHIS pilot trials, where 83% of MSM reported that the intervention was a good idea (Emetu et al., 2014) and the majority of heterosexual men suggested that participating in the intervention was valuable, interesting, and enjoyable (Milhausen et al., 2011). Significant positive predictors of acceptability of the intervention were condom use ability (*β* = .18) and condom use self-efficacy (*β* = .20). Women who had higher self-reported condom use ability and self-efficacy reported that the intervention was more acceptable than those with lower condom use ability and self-efficacy. However, the effect size of the model was small, with 10% of the variance in acceptability scores being accounted for by condom use ability and self-efficacy. Regarding implications for the HERS intervention, this could mean that recruiting those with lower self-efficacy and ability when applying condoms might prove challenging, as they may view the intervention procedures as less acceptable than those with higher condom use ability and self-efficacy. Even if this population is successfully recruited, there could potentially be high drop-out rates. While a higher incentive could encourage more women to participate, reducing drop-out might be more problematic. One way of minimizing drop-out might be to assign those with low pre-intervention ability and self-efficacy scores into a group which receives an additional pack of condoms and lubricants or financial compensation at completion of the intervention, in order to provide an incentive to stay in the programme.

The above findings are consistent with previous research on women who applied condoms to their male partners. For example, studies have reported that women who applied condoms had a more positive attitude toward sexuality and a higher frequency of sexual experiences than those who did not apply condoms (Sanders et al., 2006). Women with less experience of condom application may have more negative attitudes towards sexuality and fewer sexual experiences and thus it is possible that this group may feel that the HERS intervention is not acceptable. Those with more negative attitudes towards condoms may be less willing to discuss sexual topics and take part in a study on condom use. In this case, recruitment for this population could be made easier by offering potential volunteers the option of participating online to potentially reduce embarrassment and discomfort.

Although our data suggest that those who are more likely to take part in the HERS intervention might be women less in need of the intervention, previous research suggests that there is a “mismatch” between perceived condom application skill and actual skill. In one study, while women who applied condoms reported being more confident that they had applied condoms correctly than those who did not apply, the number of errors reported were similar in the two appliers and non-appliers groups (Sanders et al., 2003). Since the current study only used self-report instead of behavioural measures to assess condom use skills, it may be that those who felt that they already possessed good condom application skills (and therefore viewed the intervention as acceptable) would make as many errors as those who do not.

Significant negative predictors of condom use errors and problems were condom use ability (*β* = -.38) and condom use experiences (*β* = -.17), with condom use ability and experiences accounting for 28% of the variance in W-CUES scores. Women who had lower condom use ability and less positive condom use experiences reported more errors and problems when using condoms than those with higher ability and experiences. This finding is not surprising, and is congruent with findings reported in the KIHIS pilot study of heterosexual males, where condom use ability and experience improved, and condom use errors and problems decreased, following the intervention (Milhausen et al., 2011). It may be that measures of condom use ability and experiences could be used alongside the W-CUES scale in order to identify those who could benefit the most from participating in the intervention. Although, as previously discussed, recruiting these participants may be difficult because of lower acceptability of the intervention in this group.

**Qualitative Data Outcomes and Implications**

Analysis of the open-ended acceptability questions revealed that women liked that the intervention offered participants a large variety of condoms and lubricants to try, felt that the intervention placed good focus on women’s condom use experiences and ability, and thought that the intervention was sex-positive and pleasure focused. Additionally, they indicated that the intervention would allow women to increase their familiarity and confidence with condoms, and would allow condoms to become a “natural” part of sex.

When asked about their preferences, the majority of women felt that it was best to offer participants the option of completing the intervention with both a partner and a dildo, so that women may choose the option that suits them best. Participants also offered other suggestions in order to improve the programme, such as allowing women to access the intervention online to reduce embarrassment and inconvenience and inclusion of women’s partners in the intervention. Regarding implications for future research, it seems that women should be offered a range of options in order to effectively tailor the intervention to a programme which suits each individual best. This could include the option to complete the intervention online or in a practical session either individually or in groups, with a partner or without. Other interventions have successfully targeted couples instead of individuals (Burton, Darbes, & Operario, 2010). This option is supported by our findings, as many young women in our sample indicated that they would like the option to take part in the intervention as a couple.

Interestingly, while a slightly higher percentage of women (29%) indicated that the intervention would not change their opinions about condoms than those who thought that it would (26%), 72% reported that they felt that their skills would improve if they participated in the intervention. While this is only based on women speculating about whether their opinions would change, it seems it would still be beneficial if negative opinions of condoms were addressed as part of the intervention. The health professional providing the condom application demonstration could give women the opportunity to discuss these opinions during the initial meeting, and give tailored advice on how they might overcome the perceived negatives.

**Strengths and Limitations**

Online surveys in the area of sexuality have been praised as a more cost-effective alternative in order to access hard-to-reach samples than probabilistic methods (Catania, Dolcini, Orellana, & Narayanan, 2015). Additionally, the current study utilized well-established measures previously used by other researchers. The primary aim was to assess the acceptability of the HERS before preliminary trials of its efficacy are undertaken, and thus the findings have direct relevance to these trials. Information has been obtained from women who are similar to the target population for the HERS intervention about how the procedures and design of future trials can be optimised before efforts are made to evaluate the intervention. For example, participants indicated that they would prefer more choice when it comes to the intervention procedure, such as the option to participate with a partner and the ability to choose the amount of contact time with the healthcare professional. Additionally, recruitment for the HERS trials may need to be creative. As previously mentioned, those who might benefit the most from the intervention may be difficult to recruit because they feel that the intervention is less acceptable. Participants’ suggestions in this study could inform the design of future trials of the HERS and potentially increase recruitment success, reduce drop-out rates, and increase the effectiveness of the intervention itself.

There were also some limitations to the current research. All of the measures included in the survey relied on self-report, and no behavioural measures were used. Therefore, it is impossible to know whether participants have reported their behaviours accurately. Issues such as social desirability biases may have affected the data (Catania, Gibson, Chitwood, & Coates, 1990). However, some have argued that biases are less common in online studies (Mustanski, 2001). Another limitation of online surveys was that distractions could not be controlled for, and we were unable to determine whether participants had understood the questions or instructions (Catania et al., 2015). Additionally, participants were not asked whether they would recommend the intervention to their friends or sexual partners, which could have provided more insight into their view of the intervention. Finally, the open-ended question pertaining to participants’ thoughts about using the condom kit during sex or masturbation for the purposes of the intervention asked, “What do you think about asking women to use the condom kit with their partner or on a dildo (or both)?” but we did not explicitly ask women about their own willingness to use the condom kit. Although the intervention procedure indicated that women would be asked to use the condoms during sex and masturbation, some participants may not have read this description thoroughly, and therefore may not have fully understood the question.

In terms of the intervention itself, one limitation could be its scalability. Since the current intervention procedure relies on a healthcare professional to provide the initial consultation and condom demonstration, it could mean that the intervention in constrained to sexual health clinics. Although the demonstration could be given electronically via a website or app, it might be difficult to make certain that the participant has viewed this demonstration or that they have practiced the application procedure sufficiently. One possible way to circumvent this would be require participants to view the demonstration before completing each follow-up questionnaire, or to train laypersons such as youth workers to extend the intervention’s reach.

**Implications for Future Research**

 Although implications of the current research have been briefly discussed in relation to the HERS intervention, it is important to discuss the implications relevant to interventions which aim to increase condom use aimed at young women more generally. Many studies in the sexuality and sexual health area utilise samples from university and clinic populations. The use of social media enables a more diverse sampling of the population which is not constrained by location (Catania, Dolcini, Orellana, & Narayanan, 2015). Unfortunately, the current study did not collect data on ethnicity or country of residence.

Many women indicated that they felt that their partners should be involved in the intervention as well and suggested that the intervention provide tips on how to negotiate condom use successfully with their partners. The fact that women requested this focus on condom negotiation suggests that they were willing to take a more active role in their condom usage and approach condom usage as a mutual decision between partners. Previous studies have suggested that communication between partners is the strongest predictor of consistent condom use (DePadilla, Windle, Wingood, Cooper, & DiClemente, 2011).

Acceptability of the intervention in the current study was high and many women indicated that they liked the intervention because it places more focus on women taking responsibility when it comes to condom use, supporting the idea that it is important to include women in condom promotion efforts. While some previous interventions have attempted to increase condom use in women (Bryan et al., 1996; DiClemente & Wingood, 1995; St. Lawrence et al., 2001; Wingood & DiClemente, 2013), most interventions are still very male-focused.

**Conclusions**

The acceptability of the HERS intervention was high (80.7%), and participants felt that that main positives of the proposed intervention procedure were its focus on women and increasing pleasure when using condoms. They indicated that the intervention was sex-positive and that they liked that it aims to make condoms a “natural” part of sex. Acceptability was predicted by condom use self-efficacy (*β* = .20) and ability (*β* = .18), with the self-efficacy and ability accounting for 10% of the variance in acceptability scores, and frequency of condom use errors and problems was predicted by condom use ability (*β* = -.38) and condom use experiences (*β* = -.17), with ability and experiences accounting for 28% of the variance in frequency of condom use errors and problems.

The findings suggest that the HERS intervention should offer participants a greater array of options for completing the intervention (such as the ability to take part online), should consider opening the intervention up to couples, and should offer participants more opportunity to discuss their experiences of condoms and their usage with a healthcare professional. Feasibility and pilot studies of the HERS should include qualitative data, in order to provide deeper insight into women’s opinions about the interventions and suggestions for improvement. Future research into condom use promotion should also place more focus on women in order to help them overcome the perceived barriers to taking an active role in successful and complete condom use.

**REFERENCES**

Annon, J. (1976). *Behavioural treatment of sexual problems: Brief therapy.* New York, NY: Harper & Row.

British Psychological Society (2014). *Code of Human Research Ethics.* http://www.bps.org.uk/system/files/Public%20files/code\_of\_human\_research\_ethics\_dec\_2014\_inf180\_web.pdf(Accessed 5 February 2015).

Bryan, A. D., Aiken, L. S., & West, S. G. (1996). Increasing condom use: evaluation of a theory-based intervention to prevent sexually transmitted diseases in young women. *Health Psychology, 15,* 371-382.

Burton, J., Darbes, L. A., & Operario, D. (2010). Couples-focused behavioural interventions for prevention of HIV: systematic review of the state of evidence. *AIDS and Behaviour, 14,* 1-10.

Catania, J. A., Dolcini, M. M., Orellana, R., & Narayanan, V. (2015). Nonprobability and probability-based sampling strategies in sexual science. *Journal of Sex Research, 52,* 396-411.

Catania, J. A., Gibson, D. R., Chitwood, D. D., & Coates, T. J. (1990). Methodological problems in AIDS behavioural research: influences on measurement error and participation bias in studies of sexual behavior. *Psychological Bulletin*, *108*, 339-362.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *British Medical Journal*,*337*, 979-983.

Crosby, R. A., Graham, C. A., Milhausen, R. R., Sanders, S. A., & Yarber, W. L. (2010). Condom Use Errors/Problems Survey. In T. D., Fisher, C. M. Davis, W. L. Yarber, & S. L. Davis (Eds.), *Handbook of Sexuality-Related Measures* (pp. 153-157). London: Routledge.

Crosby, R., Graham, C., Milhausen, R., Sanders, S., Yarber, W., & Shrier, L. A. (2015). Associations between rushed condom application and condom use errors and problems. *Sexually Transmitted Infections*, *91*, 275-277.doi:10.1136/sextrans-2013-051491

Crosby, R. A. , Graham, C. A., Yarber, W., & Sanders, S. A. (2004). If the condom fits, wear it: a qualitative study of young African-American men. *Sexually Transmitted Infections, 80*, 306-309.

Crosby, R., Milhausen, R., Sanders, S. A, Graham, C. A., & Yarber, W. L. (2008). Two heads are better than one: the association between condom decision-making and condom use errors and problems. *Sexually Transmitted Infections, 84*, 198-201.

Crosby, R., Sanders, S., Yarber, W. L., & Graham, C. A (2003). Condom-use errors and problems: a neglected aspect of studies assessing condom effectiveness. *American Journal of Preventive Medicine, 24*, 367-370.

Crosby, R. A., Sanders, S. A., Yarber, W. L., Graham, C. A, & Dodge, B. (2002). Condom use errors and problems among college men. *Sexually Transmitted Diseases, 29*, 552-557.

Crosby, R., Shrier, L. A., Charnigo, R., Sanders, S. A., Graham, C. A., Milhausen, R., & Yarber, W. L. (2013). Negative perceptions about condom use in a clinic population: Comparisons by gender, race and age. *International Journal of STD & AIDS, 24*, 100-105.

Crosby, R. A., Yarber, W. L., Graham, C. A., & Sanders, S. A. (2010). Does it fit okay? Problems with condom use as a function of self-reported poor fit. *Sexually Transmitted Infections, 86*, 36-38.

Crosby, R., Yarber, W. L., Sanders, S. A., & Graham, C. A. (2005). Condom discomfort and associated problems with their use among university students. *Journal of American College Health, 54*, 143-147.

Crosby, R. A., Yarber, W. L., Sanders, S. A., Graham, C. A., McBride, K., Milhausen, R. R., & Arno, J. N. (2007). Men with broken condoms: who and why? *Sexually Transmitted Infections, 83*, 71-75.

Crosby, R. A., Graham, C. A., Yarber, W. L., & Sanders, S. A. (2010). Problems with condoms may be reduced for men taking ample time to apply them. *Sexual Health, 7*, 66-70.

Crosby, R. A., Salazar, L. F., Yarber, W. L., Sanders, S. A., Graham, C. A., Head, S., & Arno, J. N. (2008). A theory-based approach to understanding condom errors and problems reported by men attending an STI clinic. *AIDS and Behavior, 12*, 412-418.

DePadilla, L., Windle, M., Wingood, G., Cooper, H., & DiClemente, R. (2011). Condom use among young women: modelling the theory of gender and power. *Health Psychology, 30,* 310-319.

Department of Health. (2013). *A framework for sexual health improvement in England.* https://www.gov.uk/government/publications/a-framework-for-sexual-health-improvement-in-england (Accessed 17 December 2014).

DiClemente, R. J., & Wingood, G. M. (1995). A randomized controlled trial of an HIV sexual risk—reduction intervention for young African-American women. *Journal of the American Medical Association, 274,* 1271-1276.

Emetu, R. E., Marshall, A., Sanders, S. A., Yarber, W. L., Milhausen, R. R., Crosby, R. A., & Graham, C. A. (2014). A novel, self-guided, home-based intervention to improve condom use among young men who have sex with men. *Journal of American College Health, 62*, 118-124.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods,* *41*, 1149-1160.

Fennell, J. (2014). “And Isn't that the point?”: pleasure and contraceptive decisions. *Contraception, 89*, 264-270.

Flood, M. (2003). Lust, trust and latex: why young heterosexual men do not use condoms. *Culture Health & Sexuality, 5*, 353-369.

Family Planning Agency (2013). *Unprotected Nation The Financial and Economic Impacts of Restricted Contraceptive and Sexual Health Services.* http://www.fpa.org.uk/sites/default/files/unprotected-nation-sexual-health-full-report.pdf (Accessed 09 September 2015).

Gorbach, P. M., Pines, H., Javenbakht, M., Weiss, R. E., Jeffries, R., Cranston, R. D., Fuchs, E. J., Hezerah, M., Brown, S., Voskanian, A., & Anton, P. (2014). Order of orifices: sequence of condom use and ejaculation by orifice during anal intercourse among women: implications for HIV transmission. *Journal of Aquired Immune Dificiency Syndromes, 67*, 424-429.

Graham, C. A., Crosby, R. A., Milhausen, R. R., Sanders, S. A., & Yarber, W. L. (2011). Incomplete use of condoms: *The importance of sexual arousal. AIDS and Behavior, 15*, 1328-1331.

Graham, C. A., Sanders, S. A., Milhausen, R. R., & McBride, K. R. (2004). Turning on and turning off: A focus group study of the factors that affect women's sexual arousal. *Archives of Sexual Behavior, 33*, 527-538.

Higgins, J. A., Tanner, A. E., & Janssen, E. (2009). Arousal loss related to safer sex and risk of pregnancy: implications for women's and men's sexual health. *Perspectives on sexual and reproductive health, 41,* 150-157.

Khan, S. I., Hudson-Rodd, N., Saggers, S., Bhuiyan, M. I., & Bhuiya, A. (2004). Safer sex or pleasurable sex? Rethinking condom use in the AIDS era. *Sexual Health, 1,* 217–25.

Milhausen, R. R., Wood, J., Sanders, S. A., Crosby, R. A., Yarber, W. L., & Graham, C. A. (2011). A novel, self-guided, home-based intervention to promote condom use among young men: A pilot study. *Journal of Men's Health, 8*, 274-281.

Miranda, J., Côté, J., Godin, G., Blais, M., Otis, J., Guéhéneuc, Y. G., Fadel, G., Barton, L., & Fowler, S. (2013). An Internet-Based Intervention (Condom-Him) to Increase Condom Use Among HIV-Positive Men Who Have Sex With Men: Protocol for a Randomized Controlled Trial. *JMIR Research Protocols, 2*, e39. doi: 10.2196/resprot.2723

Mustanski, B. S. (2001). Getting wired: Exploiting the Internet for the collection of valid sexuality data. *Journal of Sex Research, 38,* 292-301.

National Institute for Health and Clinical Excellence. *One to one interventions to reduce the transmission of sexually transmitted infections (STIs) including HIV, and to reduce the rate of under 18 conceptions, especially among vulnerable and at risk groups.* http://guidance.nice.org.uk/PH3 (accessed 17 Dec 2014).

National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Reference tables.* <http://www.natsal.ac.uk/media/3935/natsal-3-reference-tables.pdf> (accessed 15 Sept 2016).

Philpott, A., Knerr, W., & Maher, D. (2006). Promoting protection and pleasure: Amplifying the effectiveness of barriers against sexually transmitted infections and pregnancy. *Lancet, 368,* 2028-2031.

Reece, M., Herbenick, D., Sanders, S. A., Monahan, P., Temkit, M. H., & Yarber, W. L. (2008). Breakage, slippage and acceptability outcomes of a condom fitted to penile dimensions. *Sexually Transmitted Infections, 84*, 143-149.

Reece, M., Herbenick, D., Schick, V., Sanders, S. A., Dodge, B., & Fortenberry, J. D. (2010). Condom use rates in a national probability sample of males and females aged 14 to 94 in the United States. *The Journal of Sexual Medicine, 7*, 266-276.

Sanders, S. A., Graham, C. A., Yarber, W. L., & Crosby, R. A. (2003). Condom use errors and problems among young women who put condoms on their male partners. *Journal of the American Medical Women's Association (1972), 58*, 95-98.

Sanders, S. A., Graham, C. A., Yarber, W. L., Crosby, R. A., Dodge, B., & Milhausen, R. R. (2006). Women Who Put Condoms on Male Partners: Correlates of Condom Application. *American Journal of Health Behavior, 30*, 460-466.

Sanders, S. A., Yarber, W. L., Kaufman, E. L., Crosby, R. A., Graham, C. A., & Milhausen, R. R. (2012).Condom use errors and problems: a global view. *Sexual Health*, 9, 81-95. doi: http://dx.doi.org/10.1071/SH11095

Spruyt, A., Steiner, M. J., Joanis, C., Glover, L. H., Piedrahita, C., Alvardo, G., Ramos, R., Maglaya, C., & Cordero, M. (1998). Identifying condom users at risk for breakage and slippage: Findings from three international sites. *American Journal of Public Health, 88,* 239-244.

St. Lawrence, J. S., Wilson, T. E., Eldridge, G. D., Brasfield, T. L., & O’Bannon, R. E. (2001). Community-based interventions to reduce low income, African American women's risk of sexually transmitted diseases: A randomized controlled trial of three theoretical models. *American Journal of Community Psychology, 29,* 937-964.

UNAIDS (2009). *Condoms and HIV prevention: Position statement by UNAIDS, UNFPA and WHO.* http://www.unaids.org/en/resources/presscentre/featurestories/2009/march/20090319preventionposition (accessed 17 December 2014).

van Teijlingen, E., & Hundley, V. (2002). The importance of pilot studies. *Nursing Standard, 16*, 33-36. doi: 10.7748/ns2002.06.16.40.33.c3214

Warner, L., Stone, K., Macaluso, M., Beuhler, J., & Austin, H. (2006). Condom Use and Risk of Gonorrhoea and Chlamydia: A Systematic Review of Design and Measurement Factors Assessed in Epidemiologic Studies. *Sexually Transmitted Infections, 33,* 36-51.

Wingood, G. M., & DiClemente, R. J. (2000). Application of the theory of gender and power to examine HIV-related exposures, risk factors and effective interventions for women. *Health Education and Behaviour, 27,* 539-565.

Wingood, G. M., & DiClemente, R. J., Robinson-Simpson, L., Lang, D. L., Caliendo, A., Hardin, J. M. (2013). Efficacy of an HIV intervention in reducing high-risk HPV, non-viral STIs, and concurrency among African-American Women: a randomized controlled trial. *Journal of Acquired Immune Deficiency Syndromes, 63,* S36.

Figure 1. *Frequency of total scores on the Acceptability Scale*



Table 1

*Demographic Characteristics of the Sample*

|  |  |  |
| --- | --- | --- |
|  | N | % |
| Relationship Status |  |  |
| Single | 85 | 30.4 |
| In a Relationship | 157 | 56.1 |
| Married | 35 | 13.5 |
| Other | 3 | 1.1 |
| Sexual Orientation |  |  |
| Heterosexual | 216 | 77.4 |
| Gay/Lesbian | 2 | 0.7 |
| Bi-Sexual | 50 | 17.9 |
| Other | 10 | 3.6 |
| Prefer not to say | 1 | 0.4 |
| Condom Use Frequency |  |  |
| Never | 59 | 21.1 |
| Rarely | 65 | 23.2 |
| Less than half the time | 20 | 7.1 |
| More than half the time | 44 | 15.7 |
| Always | 92 | 32.9 |
| Condom Application Frequency |  |  |
| Never | 126 | 45.0 |
| Rarely | 68 | 24.3 |
| Less than half the time | 37 | 13.2 |
| More than half the time | 27 | 9.6 |
| Always | 22 | 7.9 |

Table 2

*Percentages of High, Neutral, and Low Scores for the Acceptability of the Intervention*

|  |  |  |
| --- | --- | --- |
| Acceptability | N | % |
| High acceptability | 226 | 80.7 |
| Neutral | 18 | 6.4 |
| Low acceptability | 36 | 12.9 |
| Total | 280 | 100 |

*Note.* High acceptability indicates scores of 9-16, neutral indicates scores of 8, and low acceptability indicates scores of 1-7.

Table 3

*Predictors of Acceptability and W-CUES within the Regression Model*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Predictor | B | SE B | β | 95% CI |
| AcceptabilityCondom Use Self-Efficacy | .13 | .05 | .20\*\* | [.038 , .216] |
| Condom Use Ability | .10 | .04 | .18\* | [.020 , .170] |
| W-CUESCondom Use Ability | -.28 | .05 | -.38\*\*\* | [-.370 , -.192] |
| Condom Use Experiences | -.11 | .04 | -.17\*\* | [-.190, -.039] |
|  |  |  |  |  |

*Note.* \* p <.05, \*\* p <.01, *Note.* \*\*\* p <.001