One Night Stan: Feasibility Study of an HIV Prevention and Sexual Risk Reduction Social Card Game for Young Black Women

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Abstract

Objective: To develop and test the feasibility and preliminary impact of the social card game prototype, *One Night Stan*, a theory-driven and evidence-based human immunodeficiency virus (HIV) prevention intervention for young black women.

Materials and Methods: The study included the enrollment of 21 young, heterosexual black women (mean age 19) to test the feasibility and preliminary impact of the card game, using a pre/postdesign. Participant satisfaction and gameplay experience were assessed using quantitative and qualitative measures. Knowledge, self-efficacy, and intentions regarding condom use and HIV/sexually transmitted infection partner testing were assessed using standardized assessments. Effect sizes for the change in these outcome variables were calculated to determine the preliminary efficacy of the game.

Results: One hundred percent of participants reported that that they would play the game again, 95% liked the way the game looked, 100% enjoyed playing the game, and 100% reported that they would tell their friends to play. Effect sizes were large (ranged from 0.21 to 0.51) for all variables except perceived susceptibility (0.07) and suggest that playing the game can lead to increased self-efficacy and intentions to use condoms and insist that their partners get tested for HIV across time.

Conclusions: *One Night Stan* is a feasible intervention approach and may be efficacious in helping players develop a pattern of cognitions and motivation that can protect them against the risk of HIV.

Keywords: Serious games, HIV, Intervention, Women, Pilot study

Introduction

A N IMPORTANT FOCUS of the 2015 *Office of AIDS Research Strategic Plan* is reducing human immunodeficiency virus (HIV)-related disparities in racial/ethnic populations, including black women and girls.¹ In the United States, heterosexual black women are the group most affected by HIV, after men who have sex with men (MSM).² Approximately 25% of new HIV infections in the United States occur in women, 62% of whom are black women.³ In addition, previous research has shown that black adolescent women are more than twice as likely than white adolescent women to be diagnosed with a sexually transmitted infection (STI).³ Given

that STIs are associated with a two- to fivefold increase in the risk for HIV acquisition,⁴⁻⁶ an intervention targeting STIs in women will impact their risk for HIV infection.

Although black women are significantly more impacted by HIV/STIs than white or Hispanic women, this finding is not entirely explained by differences in their individual-level risk behaviors. Recent data reveal that although young white adults have higher rates of HIV/STIs when they engage in riskier behaviors, young black adults are more likely to become infected when their behaviors are considered low risk.⁷ For example, the odds of HIV/STI in young black adults were 24 times that in young white adults, with both groups reporting the same level of “low-risk behavior” such as few

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sexual partners.⁷ Therefore, it appears there are other structural and social elements at play, such as a higher prevalence of infection in the population and the presence of “social mixing” of high-risk (including MSM) and low-risk individuals in black communities.⁸ Data from a cohort of women at high risk for HIV from the HIV Prevention Trials Network 064 ISIS study indicate that of the 2099 women enrolled (88% of whom were young black women), 41% had sex with partners of unknown HIV status and only 18% reported using a condom the last time they had sex.⁹ Although black women are aware of their own risk—demonstrated by a higher rate of HIV testing (70%) compared with 63% for Hispanic women and 50% for white women¹⁰—this may not necessarily translate to a better understanding of how their partners’ risk or the risk in their environment impacts their own risk. This finding is important as one study revealed that approximately one-third of young black women stated that a specific barrier to practicing safe sex was their assessment that there was no risk because they were in a monogamous relationship and felt no need to use protection. Many later learned, however, that their partners were engaged in sexual relationships with others.¹¹

With respect to their partners’ risk of HIV, there are critical links with HIV transmission between young black women and MSM, the group with the highest HIV prevalence. In a study of 5,156 HIV-infected men and 3,139 HIV-infected women, most of whom were black, between 13%–34% of MSM reported having had sex with women. Only 6%–14% of these women acknowledged having a bisexual partner, illustrating that not only is there a high rate of bisexual activity in these HIV-infected individuals but also that women may not have known of their male partners’ bisexual activity.¹² Similarly, a study by the Centers for Disease Control and Prevention (CDC) revealed that 65% of the young men who had ever had sex with men also reported sex with women.¹³ Therefore, young black women present as a particularly high-risk group, given social and structural factors that amplify their risk of HIV, high rates of STIs, and in some cases, their misperception about the risk around them, including the overall status of their partners. Innovative interventions, including digital interventions, are needed to reduce HIV/STIs this unique and vulnerable population.

Both nondigital and digital games have a well-established role in education¹⁴ because simulated role-playing is a highly effective approach for situated learning.¹⁵ Active participation through simulated role-playing enables individuals to practice behavioral change in a safe and entertaining way.^{16,17} In addition, role-playing is a powerful mechanism for influencing people’s attitudes.^{18,19} Game interventions have demonstrated efficacy in increasing knowledge and affecting behaviors and psychological variables related to health promotion and disease management²⁰ in areas ranging from depression to medication adherence.^{21–27} Accordingly, the fields of “serious games” and “games for health” are rapidly evolving.^{28,29} There is also compelling evidence that individuals who acquire new information, motivation, behavioral skills, and behaviors in a gaming environment are more likely to act in accordance with the new skills in real life.^{30,31}

Nondigital games in particular, such as card games, are often more slowly and deliberately paced than digital games. This may help to create a shared experience with at least one other player, thus allowing for conversations between players and the opportunity to influence attitudes, beliefs, and perceptions around serious topics.³² In addition, the use of

physical objects such as tokens in a nondigital game might serve as a game equivalent to a “talking stick,” permitting clear and embodied assignation of roles between players and allowing for each player to engage in thoughtful discourse.³³

Given these findings, we developed the social card game intervention, *One Night Stan*, aimed at increasing partner HIV testing and condom use with input from discussions with young black women. Next, we conducted a feasibility study to assess (1) player’s satisfaction and gameplay experience and (2) the game’s preliminary impact on psychosocial variables related to behaviors associated with HIV prevention.

Materials and Methods

Approval for this feasibility study was obtained by the Yale University School of Medicine Human Investigation Committee. The study consisted of two phases: (1) development of the card game prototype and (2) assessment of the player’s satisfaction and gameplay experience and a preliminary investigation of the game’s impact on players’ psychosocial variables related to behaviors associated with HIV prevention.

Development of One Night Stan

We conducted group discussions with young black women to determine their perceptions and attitudes around HIV/STIs and sexual risk taking. Based on these discussions, along with the extant literature and well-established health behavior theory constructs, we created a logic model (Fig. 1) and behavior change manual or “Game Playbook³⁴” to guide the development of the intervention. We then had young women play-test the game and provide feedback, which was used to refine the card game prototype to be used for pilot testing.

One Night Stan is a multiplayer social card game for up to five players (Fig. 2). The learning goals of the game include increasing young black women’s (1) self-efficacy regarding situations involving sexual encounters, (2) self-efficacy to communicate with their partners about condom use and HIV/STI testing, and (3) risk perception regarding sexual situations and partners that could lead to contracting HIV/STI. The intervention strategy of the game was developed using constructs from well-established behavior change theories, including social cognitive theory³⁵ and health belief model,³⁶ with components of message framing.³⁷ For instance, the construct of *Observational Learning* from social cognitive theory,³⁵ which states that learning is expedited when individuals observe the behaviors of others who are similar to them, was incorporated in *One Night Stan* by creating unique role-play situations for players that resonate specifically to young black women within a shared experience. The construct of *perceived benefits* from the health belief model,³⁶ which states that a person who perceives that he or she will benefit from a particular behavior change is more likely to adhere to that change, was applied in the game through modeling and vicarious learning opportunities for the player. For instance, in the game the player experiences the benefits involved with consistent condom use, HIV/STI testing, and increased communication with sexual partners. The game intervention also provides the players with information about HIV/STI prevention, opportunities to improve

FIG. 1. Logic model of *One Night Stan*.

their self-efficacy around negotiating condom use and partner testing, as well as to develop healthy intentions and attitudes around sex, and allows them to practice these skills with their peers through gameplay. In the game, players win by earning the most *Empowerment Points*, which reinforces the idea that empowerment (self-efficacy) will give rise to positive health outcomes. The goal of the game is to collect *Empowerment Points* by getting potential partners tested (*Test Cards*), being

protected (*Condom Cards*), by recognizing facts involving sexual risk taking behaviors associated with HIV/STIs (*Fact Cards*), and to refuse risky encounters (*Response Cards*). The game revolves around a story created collectively by all players and starts with a randomly chosen guy, location, and a hidden *Health Status Card*. Throughout the game, players accumulate *Empowerment Points* by making decisions that protect themselves from possible negative situations or

FIG. 2. Examples of playing cards from *One Night Stan*.

encounters. The player with the most points at the end of the game wins.

Evaluation of game's impact and assessment of participants' gameplay satisfaction and experience

We conducted a pilot test of the social card game intervention using a one-group pretest-posttest design to collect data: (1) participants' gameplay satisfaction and experience, and (2) on the game's preliminary impact on psychosocial variables of behavior change around HIV prevention. Participants played the game together in groups of 3–5 for 1 hour twice a week for 2 weeks. Data were collected before gameplay, after completion of gameplay (2 weeks), and at a 6-week follow-up. Both quantitative and qualitative data were collected.

Participants and recruitment

We recruited young black women from a community-based organization and a private university, with more than 67% minority student enrollment, in Connecticut. We distributed flyers and information sheets in partnership with local program and university leadership. Inclusion criteria for the feasibility study were that young women were black, English speaking, and between 18 and 24 years old. Criteria regarding whether women were sexually active or engaging in high sexual risk behaviors were not included as part of the recruitment to protect participants' confidentiality and privacy related to their sexual behavior. Participants in the feasibility study provided written informed consent. All participants were reimbursed with gift cards for completing assessments.

Measures

Sexual Self-Efficacy was assessed using 11 five-point Likert-type questions that asked about participants' confidence in their ability to use condoms and to discuss condom use and HIV/STI testing with sexual partners from the Sexual Risk Behavior Beliefs and Self-Efficacy (SRBBS) Scales³⁸ (Cronbach's $\alpha = 0.79$).

Sexual Intentions was assessed using 10 five-point Likert-type questions (Cronbach's $\alpha = 0.70$) that asked about participants' intentions around condom use and HIV/STI testing from the UCLA Multidimensional Condom Attitudes Scale.³⁹

HIV/STI and risk behavior knowledge was assessed with 12 true/false questions about HIV/STIs, condoms, and risk behaviors, adapted from the HIV-Knowledge Questionnaire⁴⁰

Sexual Attitudes was assessed using 5 five-point Likert-type questions that asked about participants' attitudes toward condom use and HIV/STI testing from the UCLA Multidimensional Condom Attitudes Scale³⁹ (Cronbach's $\alpha = 0.87$).

Perceived Susceptibility was assessed using 8 five-point Likert-type questions that asked participants about their perceived susceptibility to HIV/STIs from the Sexual Risk Scales (SRS)³⁸ (Cronbach's $\alpha = 0.84$).

Sexual Risk Norms was assessed using 10 five-point Likert-type questions that asked participants about their beliefs around condom use and HIV/STI testing from the SRS³⁸ (Cronbach's $\alpha = 0.96$).

Gameplay experience was assessed using both quantitative and qualitative measures. Four five-point Likert-type questions were asked about participants' satisfaction and experience of the game. In addition, 10–15-minute focus groups were held after the assessments were completed with participants regarding their perceptions of the experience. Examples of questions asked included, "What was your favorite/least favorite part about playing the game," "how might playing this game help someone make better decisions," and "where do you think people couple play this game?"

Data analysis

Quantitative data. Quantitative data were used to provide some preliminary indicators of the potential impact of the game. Given the small sample size, and guidelines for feasibility studies advising against the use of significance testing in feasibility studies,⁴¹ our focus was on generating an effect size for any potential change in our outcome variables of interest. Conducting these tests would allow us to (1) determine whether the measures are sensitive enough to detect changes in the outcome variables and (2) provide effect sizes on which a subsequent randomized controlled trial could be powered.⁴² Therefore, our interpretation is made on the effect sizes rather than on the significance tests. The data were screened to detect missing values and outliers. Preliminary data screening revealed one univariate outlier on each of two variables. In each case, the outlier was replaced by a value of 0.10 below the next lowest score on that variable. No multivariate outliers were identified. Following these data cleaning procedures, one-way repeated-measures analysis of variances (ANOVAs) were conducted to examine changes in knowledge, self-efficacy, intentions, attitudes, perceived susceptibility, and perceived norms from the baseline assessment through the post-gameplay (2 weeks) and follow-up (6 weeks) assessments. Partial eta-squared values were calculated to determine effect sizes associated with the changes in self-efficacy, intentions, knowledge, attitudes, perceived susceptibility, and perceived norms, and were interpreted using common guidelines (0.01 = small; 0.06 = moderate; 0.14 = large effect).

Qualitative data. For the semistructured focus groups, a three-person interdisciplinary research team composed of individuals with expertise in videogame interventions, qualitative methods, and health behavior conducted the analysis using the principles of grounded theory, including the constant comparative method.⁴³ Each team member coded the focus group transcripts in sets until a comprehensive code structure was created that captured all data concepts. The team met regularly to negotiate code structure and discuss themes as they emerged from the transcripts. Once the team finalized a code structure, each team member independently coded the transcripts using ATLAS.ti (version 7.5.3) to facilitate data organization. To ensure consensus, each team member systematically reviewed one other member's codes and all discrepancies were resolved.

Results

All participants (100%) completed the baseline, 2-week, and 6-week assessments, as well as contributed to the focus

group discussion. Five groups of 3–5 participants each played the game together for an average of 49 minutes twice per week for 2 weeks (to accumulate approximately 3 hours of total gameplay). All participants were required to play four sessions of 1 hour each. If the game ended before the session was over, participants would begin a new game and play until the hour session ended. The gameplay sessions were structured such that all of the participants played the game with their assigned small group each time.

Participant characteristics

The participants in feasibility study were 21 women between the ages of 18 and 21 years (M age = 19.29 years, SD = 1.27). The majority of the participants (95.2%) reported that they were black or African American, and one participant reported to be biracial. Thirteen of 21 participants (65%) were not in a serious relationship and 16/21 (76%) participants reported ever having vaginal intercourse. Of these 16 participants, 11 (69%) were currently sexually active.

Gameplay satisfaction

Overall, participants' satisfaction with the intervention and gameplay experience was reported as high (Table 1) for all assessment questions.

Participants described the game as a fun, enjoyable experience and an interactive way to learn about sexual health. For example, one participant described her perception of the game:

“(The goal of the game) is to have fun, but to also learn about every day facts about HIV and different STIs so you can have knowledge, so when you go into a relationship with someone you are knowledgeable about how to not contract an STI....or to put yourself at less risk for contracting an STI.”

Participants also reported new information they learned from playing the game (Table 2). Participants discussed facts

TABLE 1. PARTICIPANT SATISFACTION AND GAMEPLAY EXPERIENCE

<i>Statement</i>	<i>Response</i>	<i>Percentage of response</i>
I would play this game again.	Strongly agree	95
	Agree	5
	Neutral	0
	Disagree	0
	Strongly disagree	0
I liked the way this game looked.	Strongly agree	70
	Agree	25
	Neutral	5
	Disagree	0
	Strongly disagree	0
I enjoyed playing the game.	Strongly agree	95
	Agree	5
	Neutral	0
	Disagree	0
	Strongly disagree	0
I would tell my friends to play this game.	Strongly agree	100
	Agree	0
	Neutral	0
	Disagree	0
	Strongly disagree	0

TABLE 2. NEW INFORMATION LEARNED FROM PLAYING *ONE NIGHT STAN*

New information learned

There is no cure for herpes.
 Drinking alcohol can lead to risky sexual behaviors.
 Women should carry condoms and always protect themselves.
 Some STIs, such as chlamydia and gonorrhea, can be cured with treatment; there is no cure for HIV.
 Untreated chlamydia (and other STIs) can cause reproductive issues.
 STIs, including HIV, can easily spread during unprotected sex.
 Many people have an STI, including HIV, and do not know they have it.
 Certain behaviors, such as injecting drugs, having sex with an STI person, and having sex with multiple partners, can increase a person's risk of contracting HIV.
 It is important and easy to get tested regularly.
 Just because your partners say they do not cheat does not mean they do not have an STI, including HIV.

HIV, human immunodeficiency virus; STI, sexually transmitted infection.

about STIs (including HIV), the effects of drinking alcohol on sexual behavior, the consequences of poor decision-making, including not using condoms, and the importance of asking potential partners about their sexual past, including if they had been recently tested for HIV/STIs.

The majority of participants felt the game was relatable and tailored to situations they might encounter in their own lives. For instance, one participant stated:

“It just goes to show that you never know...that you could look at someone on the surface and think, oh, he's probably a nice guy...he's probably a real respectable person, the way he's talking, the way he's dressing, but like...it goes to show that everyone has a past and everyone has secrets...you never know what someone might be hiding from you.”

When asked how playing this game might help others make better decisions, participants discussed how experiencing consequences in the game allowed women to see how certain choices could affect their lives, providing women the knowledge and empowerment to make good choices when confronted with real-life situations. For instance, one participant described her experiences from playing the game:

“I feel like it's better to play the card game than it happening in real life. Because then you learn from the card game and you don't get no diseases. But in real life, if you are doing all that, like, you never know, you can get something. I feel like you can take what you learn from the card game and apply it to real life.”

The impact of the One Night Stan social card game

The means and standard deviations for each of the outcomes at baseline, 2 weeks (post-gameplay), and at 6 weeks are presented in Table 3.

The analyses examining changes in self-efficacy and intentions across time revealed significant multivariate effects. For self-efficacy, Wilks' $\lambda = 0.49$, $F(2, 16) = 9.26$,

TABLE 3. IMPACT OF GAME ON PRIMARY AND SECONDARY OUTCOMES

	Baseline <i>M</i> (<i>SD</i>)	Posttest (2 weeks) <i>M</i> (<i>SD</i>)	Follow-up (6 weeks) <i>M</i> (<i>SD</i>)	Effect size
Self-efficacy	4.45 (0.41)	4.75 (0.37)	4.68 (0.42)	0.51
Intentions	4.48 (0.39)	4.70 (0.38)	4.58 (0.53)	0.51
Knowledge	10.33 (0.97)	11.06 (0.80)	10.89 (1.13)	0.24
Attitudes	4.14 (0.74)	4.31 (0.78)	4.36 (0.55)	0.21
Perceived susceptibility	1.66 (0.69)	1.58 (0.74)	1.63 (0.77)	0.07
Perceived norms	4.16 (0.73)	4.38 (0.62)	4.36 (0.78)	0.29

Effect sizes were interpreted using the following guidelines: 0.01 = small; 0.06 = moderate; 0.14 = large.⁴¹
SD, standard deviation.

$P=0.002$, and a large effect size was observed (multivariate partial eta-squared=0.51). Pairwise comparisons indicated that self-efficacy scores were significantly higher at posttest and follow-up compared with baseline, with no significant differences in scores between posttest and follow-up. With regard to intentions, Wilks' lambda=0.49, $F(2, 16)=9.29$, $P=0.002$, with a large effect size (multivariate partial eta-squared=0.51). Pairwise comparisons indicated that intention scores were significantly higher at posttest and follow-up compared with baseline, with no significant differences in scores between posttest and follow-up. Improvements in scores for both self-efficacy and intentions reflect the development of healthier motivation.

Results from the one-way repeated-measures ANOVAs revealed nonsignificant multivariate effects for knowledge, attitudes, perceived susceptibility, and perceived norms. Despite these nonsignificant effects, a few notable findings emerged from these analyses. Although nonsignificant, a visual inspection of the means for knowledge at each assessment point shows an improved score from baseline to posttest with a slight decrease in knowledge score between posttest and follow-up. In addition, the multivariate test for perceived norms did demonstrate a trend toward an improvement in perceived norms across time, $P=0.083$, which was characterized by large effect size (multivariate partial eta-squared=0.287). A visual inspection of the means at each assessment point shows an improved score from baseline to posttest, which is maintained to the follow-up.

Discussion

HIV interventions that focus on reducing sexual risk behaviors and promoting positive health behaviors for young black women are lacking. Because peers play an important role in the promotion of and protection from risk associated with HIV/STI^{44–48} by offering opportunities for individuals to exchange information, learn social norms, develop behavioral skills, and influence each other's attitudes, intentions, and behaviors,⁴⁹ interventions involving peers that counter individual-level risk perception by promoting condom use and HIV/STI testing in partners are critical. For this study, we created a culturally relevant and tailored intervention for young black women with input from young black women to understand their unique perspectives and lived experiences, including influences within their environment that impact their decisions to engage in sexual risk behaviors.

After development of the game, we conducted a feasibility study of our intervention. Participants described the game as

a fun, enjoyable experience and an interactive way to learn about sexual health. Overall, participants' satisfaction with the intervention and gameplay experience was reported as high. In terms of how the game looked, 70% strongly agreed with the statement, "I liked the way the game looked," while 30% agreed with the statement. We believe this slightly lower rating was because of our use of stock art for the game prototype. Our analysis of the pilot quantitative data revealed changes in self-efficacy and intentions over time, characterized by large effects. Our data also pointed to trends in the expected direction for knowledge and perceived norms. Although these findings are based on a small sample, we present the preliminary findings with a focus on (1) demonstrating that our measures may be sensitive to change in the outcome variables of interest and (2) using the effect sizes to provide preliminary evidence that the game may influence the target outcomes. The effect sizes derived from this study could be used to determine the appropriate sample size for a subsequent randomized controlled trial testing the effects of *One Night Stan*.

Although effective HIV/STI prevention programs for black women presently exist, challenges regarding implementation and fidelity have been a concern. For instance, the Diffusion of Effective Behavioral Interventions (DEBIs) require trained interventionists such as clinicians or practitioners to implement and often involve interactive, face-to-face sessions, and considerable community resources to implement. A social card game intervention such as *One Night Stan* would augment these efforts, is interactive, does not require trained facilitators, and is easily accessible.

Despite the need for HIV/STI prevention programs in community-based organizations and the evidence of their success, service providers often lack access to them,⁵⁰ selectively implement program components,^{51,52} or never implement the programs at all.⁵³ Recent studies have cited several barriers to the implementation of HIV/STI prevention interventions, including access to adequately trained providers, staff turnover, resource constraints of agencies, fidelity of the interventions, and challenges of adapting an intervention from one population to another.^{54–56} In addition to consistent fidelity and limited demand on program resources, *One Night Stan* offers some new features that could augment those found in many HIV prevention interventions, including those associated with DEBI that target young black women. For instance, as a card game, *One Night Stan* is packaged in a self-contained "vehicle" that can be easily accessible and widely available to young black women. The card game is interactive with opportunities for players to repeatedly build skills and allows for young women to

engage with others, thus increasing their exposure (or “dose”) to the intervention. In addition, *One Night Stan* does not require personnel cost or staff training.

This feasibility study demonstrates that *One Night Stan* has the potential to impact psychosocial variables related to HIV prevention behaviors and provides a highly enjoyable and satisfactory gameplay experience for young black women. Our high enrollment and retention rates may have been due to the high level of engagement and enjoyment of playing the game. It should be noted, however, that enrollment and gameplay sessions took place on a university campus, where all of the participants went to school and lived on campus. In addition, most participants knew each other within their gameplay group, which may have also influenced compliance to attend sessions and complete assessments. We did not encounter any issues with delivering the intervention or obtaining assessment data at any time points.

There were several limitations to this study. This was a small sample size of young black women from two sites in one region, limiting our ability to conduct adequately powered parametric statistical analyses or generalize findings to the larger population of young black women in other geographical locations. In addition, participants in this study were willing to play the game and provide feedback. We did not include a control group in our study; therefore, the observed changes in self-efficacy and intentions cannot be attributed entirely to the game.

Given that social card gameplay is widespread, a game for HIV/STI prevention in young black women has the potential for greater dissemination and impact in comparison with other HIV/STI interventions. One future next step could be to further iterate on the card game using additional focus groups with young black women to further develop the intervention and then evaluate the game in a randomized controlled trial. A second future step could be to adapt the game for other unique populations at risk for health disparities, including young men that have sex with men and minority at-risk young adolescents. A third future next step could include the development of a *One Night Stan* multiplayer videogame intervention, which would have players engaging with their peers on mobile devices, providing them with role-playing and discussion opportunities beyond the limitations of a card game. For instance, a videogame intervention would allow for more content to be created and can be adapted for different target audiences. Given the platform of a mobile game, delivery of the intervention could be streamlined with optimal opportunities for dissemination allowing for increased levels of reach and impact.

Conclusions

As demonstrated in this pilot, women who played the social card game intervention, *One Night Stan*, reported improvements in self-efficacy and intentions related to HIV prevention. In addition, participants reported high satisfaction and enjoyment with the intervention. This pilot demonstrated how an engaging, social card game intervention can be developed using health behavior theory, extant research, expert input, and target audience input. Future next steps include using findings from the pilot as a foundation for future adaptations of the game for other at-risk populations

as well as for the development of a videogame intervention for greater reach and impact.

Acknowledgment

This study was supported by the Women’s Health Research at Yale.

Author Disclosure Statement

K.H., PhD, and L.E.F., MD, Coprincipal Investigators, had full access to all the data in the study and took responsibility for the integrity of the data and the accuracy of the data analysis.

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