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I, Amar Shireesh Kanekar, hereby submit this original work as part of the requirements for the degree of:

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Testing the Efficacy of a brief Social Cognitive Theory based safer sex intervention among African-American College students

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Testing the Efficacy of a Brief Social Cognitive Theory Based Safer Sex Intervention among African American College Students

A dissertation submitted to the School of Human Services, Health Promotion and Education Program of the University of Cincinnati in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY (Ph.D.) in the Health Promotion and Education Program of the College of Education, Criminal Justice and Human Services 2009 by Amar Kanekar M.B.B.S, Mumbai University, 1998 M.P.H, Western Kentucky University, 2006 Committee Chair: Professor Manoj Sharma, M.B.B.S, PhD
Safer sex is important for protection against STDs and HIV/AIDS. Most of the HIV-related research is targeted towards high-risk groups such as prostitutes, gays and substance abusers but there is evidence that HIV/AIDS is increasing in college students particularly among African American college students. Social cognitive theory was used in the past to reduce teenage drinking, improve cardiovascular health, and healthy nutrition. Very few of the theory constructs had been used to predict safer sex behaviors in college students. The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college students.

A preliminary study using a cross-sectional survey design was conducted. Six self-report scales were developed for (1) situational perceptions toward safer sex, (2) expectations for safer sex, (3) self-efficacy for safer sex, (4) self-efficacy in overcoming barriers for safer sex, (5) self-control for safer sex and (6) practices for safer sex. Readability, face validity and content validity of these scales were established by a panel of six experts and the researcher in a two round review process. Construct validity of scales was established by confirmatory factor analysis by administering it to 150 college students. The scales were found to be construct valid, internally consistent with most Cronbach’s alpha over 0.70 and satisfactory test retest reliability coefficients over 0.70.

For the main study a randomized controlled design was used. The statistical design was a one between and one within repeated measures design. A convenience sample of 141 African-American college students from all majors, undergraduate and graduate students was randomized into two arms of the intervention such that there were approximately equal groups of 70 students.
in each arm of the intervention (theory-based) and control (knowledge-based) group. The intervention for each arm of the target population of African American college students consisted of two hour workshops. A pretest, a post-test at one week and a follow-up of the participants at six weeks was conducted.

Data were analyzed using SPSS version 16 for descriptive statistics. Repeated measures analyses of variance were carried out using the SAS version 9.1. Results indicated that the students assigned to the experimental (theory-based) and the knowledge-based (non-theory) intervention group did not differ in terms of the demographic variables. The mean changes in scores for various constructs of social cognitive theory used in this study were not significantly different between pre- and post-intervention. It can be concluded that there is no difference between a brief theory-based intervention (based on social cognitive theory) and a brief knowledge-based intervention in terms of efficacy in developing safer sex behavioral skills in a study sample of African-American college students at a large mid-western University. Dose of the intervention was found to be insufficient and must be increased in future interventions.
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I want to thank my wife – Sameera for her continuous support and encouragement throughout this study and my parents for their love, blessings and faith in my abilities. And finally this study would not be completed without God’s blessings.
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Chapter 1

Introduction

Safer sex, defined as correct and consistent usage of condoms and indulging in a monogamous relationship (having one partner), was important for protection against sexually transmitted diseases including Human immunodeficiency virus/ Acquired immunodeficiency syndrome (HIV/AIDS). Globally it was seen, that young people aged 15-24 years accounted for 40% of new HIV-infections (Henry Kaiser Family Foundation, 2006). Studies had shown that African American college students were at a high risk for HIV/AIDS (Johnson, Gilbert, & Lollis, 1994; Reitman et al., 1996). It was also documented that attention to behavioral skills for negotiating safer sex, training in proper use of condoms and promoting monogamy were key elements in reducing high risk behaviors among this population (Bazargan, Kelly, Stein, Husaini, & Bazargan, 1996).

This chapter begins with a brief description of the magnitude of the HIV/AIDS epidemic, research done in college students pertaining to determinants and interventions for safer sex behaviors, and significance of social cognitive theory pertaining to safer sex behaviors. Next in this chapter, the purpose of the study, study importance, research questions and hypotheses were explained. Finally in this chapter the delimitations, limitations, assumptions and operational definitions are discussed.

The HIV/AIDS epidemic has taken a tremendous toll on the United States population. When it comes to African-American population, HIV/AIDS epidemic is a health crisis. In 2005, blacks accounted for 18,121(49%) of the estimated 37,331 new HIV/AIDS diagnosis in 33 states while they constitute only around 13% of the total population. Furthermore of the estimated 18,849 people under age of 25 whose diagnosis of HIV/AIDS was made from 2001-2004, in 33
states with HIV reporting, 11, 554(61%) were black (CDC, 2008). The estimated percentage of
HIV/AIDS diagnosis among age group 13-24 was 60.6% with the total estimate to be 50% for all
33 states from 2001-2005 for African-American population.

Research in college students: Determinants for safer sex behaviors

Most of the HIV-related research was targeted towards high-risk groups such as prostitutes,
gays and substance abusers but there was evidence that it was increasing in college students as
well (Lewis, Malow, & Ireland, 1997). In a study that examined the determinants of HIV/AIDS
related risky behaviors, the predictors were found to be condom usage, knowledge about
HIV/AIDS, communication with sexual partners, and sexual self-efficacy. Based on the study of
these determinants the recommendations for HIV/AIDS interventions in a college population
was suggested to provide emphasis on condom promotion and improving accessibility and
acceptability along with good communication between partners. Also important was correcting
misperceptions and beliefs about acquiring the disease and persuading students of the adverse
effects of being in a non-monogamous relationship and engaging in substance abuse (Lewis,
Malow, & Ireland, 1997).

Public health significance of the study

College students across the nation were susceptible to contracting sexually transmitted
diseases including HIV/AIDS as they indulged in unsafe sex practices (Diclemente, 2000).
Constructs from various models such as Theory of Reasoned Action, and the Health Belief
Model had been used in the past to predict safer sex behaviors among college students. Self-
efficacy skills and expectancies to use condoms were the two variables which best predicted
safer sex behaviors (Strader & Beaman, 1991). To change risky sexual behavior implies
assessment of cognitive factors influencing students’ decision making regarding safer sexual
behavior (Patel, Gutnik, Yoskovitz, O’Sullivan, & Kauffman, 2006). Social cognitive theory had been used in the past to reduce teenage drinking, improve cardiovascular health, and promote healthy nutrition (Glanz & Lewis, 2002). Very few of the theory constructs had been used to predict safer sex behaviors in college students (O’leary, Goodhart, Jemmot, & Daria, 1992).

**Purpose of this study**

The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college students. Hence, in this study five constructs of social cognitive theory to predict safer sex behaviors among African American college students were utilized. This study predicted an increase in these constructs at the end of the intervention period and at follow-up. The results of this study would help in having safer sex interventions in future college populations as a public health measure for HIV/AIDS prevention.

A schematic depiction of this study is presented in Figure 1. The primary objectives of this study were to:

1. Examine the effects of a theory-based (experimental) and a traditional, non-theory-based (knowledge-based) intervention on SCT constructs namely situational perceptions for safer sex, expectations (outcome expectations x outcome expectancies) for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex and self-control for safer sex.
2. Examine the effects of a theory-based (experimental) and a traditional non-theory based (knowledge-based) intervention on safer sex behavioral skills.

A secondary objective of this study was to

1. Examine the relationships between change (from before to after interventions) in significant SCT constructs (that were hypothesized as precursors to safer sex behaviors) and change in safer sex behavioral skills.
Some of the methodological prerequisites for conducting this study were:

1. Develop a valid and reliable instrument that measured constructs of SCT (as detailed above), and 2) safer sex behavioral skills

2. Assess the degree of fidelity of program implementation in both theory-based (experimental) and a traditional non-theory based (knowledge-based) intervention.

Study importance

The current study used five constructs of the social cognitive theory including expectations for safer sex (outcome expectations x outcome expectancies), situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self-control for safer sex. The knowledge construct of the social cognitive theory was not used as it was believed that college students had a good knowledge about HIV/AIDS and sexually transmitted diseases along with use of safer sex behaviors to prevent getting a disease. Environment construct was also not used in this study as it is difficult to modify the physical and social circumstances of individual participants.

A parsimonious model was used in this study which included five constructs from social cognitive theory. The numbers of constructs were more than the number of constructs used in any of the past studies (Strader & Beaman, 1991; Wulfert, & Wan, 1995).
Figure 1. Study framework of a safer sex intervention among African-American college students based on Social Cognitive Theory (SCT).
Social Cognitive Theory had been used extensively along with the Information-Behavioral-Skills model to reduce HIV risk behaviors and sexually transmitted diseases in heterosexual African-Americans (Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008; Semann et al., 2002). Furthermore brief interventions in African-American adolescents especially in school-based and community settings had been effective in the past in promoting safer sex behaviors (Ickes, & Sharma, 2007). Hence, the current study tests a social cognitive theory based brief intervention for safer sex behavioral change among a target population of African-American college students.

Research Questions

1. Is there a significant difference between experimental (theory based) and knowledge based (non-theory) groups in mean situational perceptions for safer sex scores from pre to post intervention and at a 6 week follow up?

2. Is there a significant difference between experimental (theory based) and knowledge based (non-theory) groups in mean expectations (outcome expectations x outcome expectancies) for safer sex scores from pre to post intervention and at a 6 week follow up?

3. Is there a significant difference between experimental (theory-based) and knowledge based (non-theory) groups in mean self-efficacy for safer sex scores from pre to post intervention and at a 6 week follow up?

4. Is there a significant difference between experimental (theory based) and knowledge based (non-theory) groups in mean self-efficacy in overcoming barriers for safer sex scores from pre to post intervention and at a 6 week follow up?
5. Is there a significant difference between experimental (theory based) and knowledge based (non-theory) groups in mean self-control for safer sex scores from pre to post intervention and at a 6 week follow up?

6. Is there a significant difference between experimental (theory based) and knowledge based (non-theory) groups in mean safer sex scores from pre to post intervention and at a 6 week follow up?

7. What is the degree of fidelity in program implementation in both experimental (theory based) and knowledge based (non-theory) groups?

8. If there are significant changes over time, what is the relationship between changes in significant SCT variables (from situational perceptions for safer sex, expectations for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex and self-control for safer sex) and changes in safer sex behavioral skills?

9. If there are significant changes over time, what is the ability of the changes in significant SCT variables (from situational perceptions for safer sex, expectations for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex and self-control for safer sex) to account for variance in changes in safer sex behavioral skills?

**Hypotheses**

Hypothesis #1: African-American students receiving a theory based intervention will have higher situational perceptions for safer sex than African American students receiving a knowledge based intervention.

Alternative Hypothesis#1: African-American students receiving a theory based intervention will have lower situational perceptions for safer sex than African American students receiving a knowledge based intervention.
Null Hypothesis#1: There will be no differences in situational perceptions for safer sex scores between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.

Hypothesis#2: African American students receiving a theory based intervention will have higher expectations for safer sex than African American students receiving a knowledge based intervention.

Alternative Hypothesis#2: African American students receiving a theory based intervention will have lower expectations for safer sex than African American students receiving a knowledge based intervention.

Null Hypothesis#2: There will be no differences in the expectations for safer sex scores between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.

Hypothesis# 3: African American students receiving a theory based intervention will have higher self-efficacy for safer sex than African American students receiving a knowledge based intervention.

Alternative Hypothesis#3: African American students receiving a theory based intervention will have lower self-efficacy for safer sex than African American students receiving a knowledge based intervention.

Null Hypothesis #3: There will be no differences in self-efficacy for safer sex scores between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.
Hypothesis 4: African American students receiving a theory based intervention will have higher self-efficacy in overcoming barriers for safer sex than African American students receiving a knowledge based intervention.

Alternative Hypothesis 4: African American students receiving a theory based intervention will have lower self-efficacy in overcoming barriers for safer sex than African American students receiving a knowledge based intervention.

Null Hypothesis 4: There will be no differences in self-efficacy in overcoming barriers for safer sex scores between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.

Hypothesis 5: African American students receiving a theory based intervention will have higher self-control for safer sex than African American students receiving a knowledge based intervention.

Alternative Hypothesis 5: African American students receiving a theory based intervention will have lower self-control for safer sex than African American students receiving knowledge based intervention.

Null Hypothesis 5: There will be no differences in self-control for safer sex scores between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.

Hypothesis 6: African American students receiving a theory based intervention will have higher safer sex behavioral skills score than African American students receiving a knowledge based intervention.
Alternative Hypothesis#6: African American students receiving a theory based intervention will have lower safer sex behavioral skills score than African American students receiving knowledge based intervention

Null Hypothesis#6: There will be no differences in safer sex behavioral skills score between African American students receiving a theory-based intervention and African American students receiving a knowledge based intervention.

Delimitations

Delimitations for this study included geographical location and target population. This study included only African-American college students recruited from a large Midwestern University in the United States. The results of this study may not be generalized to other locations and African-American students elsewhere. In operationalizing the constructs of Social Cognitive Theory only situational perception, expectations, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self control were operationalized. Other constructs such as knowledge, environment, and emotional coping were not measured in this study. Finally, the evaluation was delimited to only process and impact variables. No attempt was made to measure sexual behaviors or health related outcomes.

Limitations

This study was limited by the self-reporting accuracy of the participants. Specifically participants provided information on demographics, statements of safer sex behaviors, constructs of social cognitive theory such as situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, expectations for safer sex, expectancies for safer sex and self-control for safer sex. Participants were also asked to report on age at onset of sexual intercourse, number of sexual partners in the previous year and history of sexually
transmitted diseases. Any inaccuracy in memory or distortions in these self-reports impacted the study results.

The sample was not randomly selected; hence the results apply only to the study participants and cannot be generalized to other college students. The emphasis of this study was on efficacy testing and therefore random assignment of participants between experimental and control groups was utilized.

Assumptions

An assumption was made that the self-report survey completed by the participants was honest, accurate and complete. The effects of the intervention were measured before and after the intervention.

Operational Definitions

1. **Expectations for safer sex**- Expectations comprise multiplicative score of outcome expectations and outcome expectancies which are then added up to get the summative score. There were four items for outcome expectations each on a scale of 1-5 & four items for outcome expectancies each on a scale of 1-5, yielding a possible range of 4-100.

2. **Outcome expectancies for safer sex**- We operationally defined outcome expectancies for safer sex as personal value placed on the anticipatory outcome benefits of safe sex behavior (condom usage at all times of engaging in sexual intercourse and monogamy (having only one partner from time of initiation of sexual intercourse) in target population of undergraduate college students.

3. **Outcome expectations for safer sex**- We operationally defined outcome expectations for safer sex as anticipated outcome benefits (feeling satisfied, feeling healthy, feeling protected, enjoying sexual experiences, worrying less about catching a disease, and being more
confident about their sexual lives) of safe sex behavior (condom usage at all times of engaging in sexual intercourse and monogamy (having only one partner from time of initiation of sexual intercourse) in target population of undergraduate college students.

4. **Safer sex behavioral skills scores** - We operationally defined safer sex behavioral skills scores as correct and consistent condom usage while engaging in sexual intercourse and having one sexual partner ever (monogamy). In this study safer sex behavioral skills score were measured by a 5-point 5-item scale with a possible range of 5-25.

5. **Self-control for safer sex** - We operationally defined self-control for safer sex as the ability of an undergraduate college student to self-reward upon adequate accomplishment of safe sexual behavior (condom use every time engaging in sexual intercourse and having one partner from first time initiation of sexual intercourse) and self-set goals. In this study self-control about safer sex was measured by a 5-point 4-item scale with a range of 4-20.

6. **Self-efficacy in overcoming barriers for safer sex** - We operationally defined self-efficacy in overcoming barriers for safer sex as the confidence that an undergraduate college student will have in his or her ability to initiate condom use when while indulging in sexual intercourse, be consistent in its usage on every occasion and being correct in its usage at all times when faced with barriers. In this study self-efficacy in overcoming barriers for safer sex was measured by a 5 point 4-item scale with a possible range of 4-20.

7. **Self-efficacy for safer sex** - We operationally defined self-efficacy for safer sex as the confidence that an undergraduate college student will have in his or her ability to initiate condom use while indulging in sexual intercourse, be consistent in its usage on every occasion and being correct in its usage at all times. In this study self-efficacy for safer sex was measured by a 5 point 5-item scale with a possible range of 5-25.
8. **Situational perception for safer sex**: We operationally defined situational perception for safer sex as insights pertaining to condom use and having monogamous relationships. In this study situational perception for safer sex was measured by a 5-point 4-item scale with a possible range of 4-20.
Chapter 2

Review of the Literature

The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college students.

The current study used five constructs of the social cognitive theory including expectations for safer sex (outcome expectations x outcome expectancies), situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self-control for safer sex. The knowledge construct of the social cognitive theory was not used as it was believed that college students had a good knowledge about HIV/AIDS and sexually transmitted diseases along with use of safer sex behaviors to prevent getting a disease. The environment construct was also not used in this study as it is difficult to modify the physical and social circumstances of individuals.

A parsimonious model was used in this study which included five constructs from social cognitive theory. The numbers of constructs were more than the number of constructs used in any of the previous studies examining safer sex (Strader & Beaman, 1991; Wulfert, & Wan, 1995). Along with Information-Behavioral-Skills model, Social Cognitive Theory has been used extensively along with the Information-Behavioral-Skills model in the past in reducing HIV risk behaviors and sexually transmitted diseases in heterosexual African-Americans (Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008.; Semann et al., 2002). Furthermore brief interventions in African-American adolescents especially in school-based and community settings have been effective in the past in promoting safer sex behaviors (Ickes, & Sharma, 2007). Hence, the current study tests a social cognitive theory based brief intervention for safer sex behavioral change among a target population of African-American college students.
This chapter is divided into multiple sections, each having a separate heading. It starts with a section on the search strategy for reviewing the literature followed by a section explaining the magnitude of the existing HIV/AIDS problem. The next section discusses the cultural and gender-related issues among the African-American population. This section is followed by a section which discusses determinants of safer sex in adolescents and college students, followed by a section titled determinants of safer sex in African-American adolescents and college students.

The next two sections deal with a) review of interventions for safer sex and HIV/AIDS prevention among adolescents and college students and b) review of interventions for safer sex and HIV/AIDS prevention among African-American adolescents and college students.

The next three sections deal with a) review of survey instruments dealing with safer sex in adolescents and college students and b) review of use of social cognitive theory in safer sex behavior and c) a conclusion and summary of the review.

Search Strategy for reviewing the literature

In order to collect materials for studying determinants of safer sex in college students, a detailed search of CINAHL, MEDLINE, ERIC, Academic Search Premier, Web Of Science, Social Sciences Citation Index databases was carried out for the time period 1990-2008. A Boolean search strategy, where the key words entered for search were “safer sex” and “determinants” and “college students” and “HIV/AIDS” and “determinants” and “college students” in differing orders was used for extraction of studies related to determinants of safer sex among college students. The criteria for inclusion of studies were (1) publication in English language, (2) publication between 1990 and 2008, (3) location of studies anywhere in the world, and (4) relating to determinants or antecedents involving adolescents and college students.
Exclusion criteria were publications in languages other than English and studies published prior to 1990. A total of 12 studies met the criteria and were included in the literature review.

Similarly, in order to collect materials for reviewing determinants of safer sex in African-American college students, a detailed open search of CINAHL, MEDLINE, ERIC, Academic Search Complete, Scopus, Web of Science, Social sciences citation index, Health source consumer index, professional development collections was carried out. A Boolean search strategy was utilized where the key words entered for search were “African-Americans” and “safer sex” and “safer sex” and “African-American adolescents” and “HIV/AIDS” and “African-Americans”. This yielded a total of 300 hits. All the abstracts titles were looked at closely pertaining to ‘determinants’, ‘factors’ or/and ‘antecedents’ and which had ‘college students’ or ‘adolescents’. Forty abstracts were read dealing with ‘African-American students’ and ‘safer sex’. The criteria for inclusion of studies were (1) publication in English language, (2) publication between 1990 and 2008, (3) location of studies anywhere in the world, and (4) relating to determinants or antecedents involving African-American adolescents and college students. Exclusion criteria were (1) publications in languages other than English (2) same study published in another journal (3) studies on adolescents other than African-American students.

In order to collect materials for safer sex interventions in college students, all the databases used earlier were searched but with key words “HIV/AIDS prevention” and “interventions” and “college students” and “safer sex” and “interventions” and “college students” in differing orders. The same inclusion and exclusion criteria were used plus the inclusion criteria of interventions involving adolescents and college students. For collecting material related to interventions for safer sex among African-American adolescents and college students, a detailed search of CINAHL, MEDLINE, ERIC, Academic Search Complete, Scopus, Web of Science...
yielded a total of 673 hits. All the titles of these studies were carefully considered and only titles having key words such as ‘intervention’, ‘safer sex’ and ‘adolescent’ or ‘college students’ were examined. This narrowed the search to 30 abstracts. The same inclusion and exclusion criteria were used plus the inclusion criteria of location of studies anywhere in the world, and interventions about safer sex involving African-American adolescents and college students plus the exclusion criterion of interventions about safer sex in adults and school-children. A total of 25 studies met these criteria and they were included in this review.

A review of instrumentation for safer sex was carried out using databases including ‘Academic Search Premier’, ‘CINAHL with Full text’; ‘ERIC’, ‘MEDLINE’, and ‘Psychology and Behavioral Sciences collection’ and the key word used for search were ‘instruments’ and ‘safer sex’. The same inclusion and exclusion criteria were used plus the inclusion criterion of studies relating to instrumentation in safer sex. A total of four studies were extracted.

For studying literature related to use of social cognitive theory in safer sex a Boolean search strategy using key words such as ‘social cognitive theory’ and ‘safer sex’ and ‘social cognitive variables and ‘safer sex’ of databases such as ‘Academic Search Premier’, ‘CINAHL with Full text’, ‘ERIC’, ‘MEDLINE’, Scopus. The same inclusion and exclusion criteria were used plus studies relating to use of social cognitive theory or social cognitive variables in safer sex. A total of 15 studies were retrieved. They were included in this review.

Magnitude of the problem

Safer sex behaviors such as correct and consistent condom usage and a monogamous relationship were important for protection against STDs (sexually transmitted diseases) and HIV/AIDS (Human Immunodeficiency virus/acquired immunodeficiency syndrome). The HIV/AIDS epidemic had reached alarming proportions. There were an estimated 1,147,697 cases
diagnosed and reported to the Centers for Disease Control and Prevention (CDC) at the end of 2004 (Centers for Disease Control and Prevention[CDC], 2006). When it came to the African-American population, HIV/AIDS epidemic was a health crisis. In 2005, blacks accounted for 20, 187 estimated cases of AIDS (as these numbers did not represent reported case counts and were point estimates which resulted from adjustments of reported case counts, adjustments were for reporting delays and for redistribution of cases in persons initially reported without an identifiable risk factor but not for incomplete reporting) out of a total of 41, 897 cases of AIDS diagnosed (CDC, 2005). The HIV prevalence rate for black men( aged ≥ 13 years) was six times the rate of white men ( aged ≥13 years) at end of 2006(CDC, 2008). Among the estimated number of persons living with AIDS at the end of 2005, 22,988(19%) black male adult or adolescent had high risk heterosexual contact. Hence, HIV/AIDS was a growing problem in younger age groups as well as in the adult populations. Promotion of safer sex behaviors such as correct and consistent condom usage along with monogamous relationships was recommended as an important way to control this epidemic. There were multiple underlying causes when it came to the African-American community being vulnerable to diseases such as HIV/AIDS and sexually transmitted diseases.

African-Americans-Gender and Cultural issues

Research studies done in the past had made an effort in identifying underlying subgroups affected by HIV/AIDS (Sellers, Smith, Shelton, Rowley, & Chavous, 1998). Such a distinction was very important as these subgroups may differ from the point of motivation for behavioral change, health threatening messages, and receptiveness to HIV prevention messages (Beatty, Wheeler, & Gaiter, 2004). Adding a component of gender issues to this discussion, women had little control over engaging in safer sex activities, as males dominated issues around condom
usage (Crepaz, & Marks, 2002) and women who reported childhood sexual abuse were more likely to engage in substance abuse and risky sexual behaviors than women who had not experienced childhood sexual abuse (Dilorio, Hartwell, & Hansen, 2002).

Culture was a dynamic and changing process which included elements such as beliefs, values, norms and practices held in common among a group of people (Office of Behavioral and Social Science Research [OBSSR], 2001). Many of the behavioral interventions in HIV stressed individual behavior change and little importance was given to status, culture, gender relationships and psychological variables (Amaro, 1995). Race, gender and class were important social variables in the life of young African American women (Chang, 2003; Sanders-Phillips, 2002). Sociostructural factors and psychological factors were found to be highly interactive in predicting health behavior outcomes in a target population of African American women from the aspect of HIV preventive behavior (Jipguep, & Sanders-Phillips, & Cotton, 2004).

There were some African-American cultural precepts such as cosubstantiation, interdependence, collectivism, transformation, cooperation, and synergism which played a significant role when developing and implementing behavioral change models in this population (Association of Black Psychologists, 1997). Most of the studies done in the past which claimed to have a culture centric focus for looking into the HIV/AIDS problem among African American population incorrectly confused ‘racial/ethnic’ focus with ‘cultural’ focus as was pointed out in a literature review which addressed culture specific HIV preventive interventions among African American population (Wilson, & Miller, 2003). Culture as we understand encompasses language, beliefs, norms, rituals, tradition and many more aspects and very few studies seem to have included this component (Belgrave, 2002; Winfield, & Whaley, 2002).
Determinants of safer sex among adolescents and college students

Most of the HIV-related research was targeted towards high-risk groups such as prostitutes, gays and substance abusers but there was evidence that it was increasing in college students as well (Lewis et al., 1997).

In a study that examined the determinants of HIV/AIDS related risky behaviors, the negative predictors were found to be condom usage, knowledge about HIV/AIDS, communication with sexual partners, and sexual self-efficacy. Based on the study of these determinants the recommendations for HIV/AIDS interventions in a college population was to provide emphasis on condom promotion and improving accessibility and acceptability along with good communication between partners. Also important was correcting misperceptions and beliefs about acquiring the disease and persuading students to believe the adverse effects of being in a non-monogamous relationship and engaging in substance abuse (Lewis et al., 1997).

Some of the risk factors for engaging in unsafe sexual activities among the college students were use of alcohol (DiClemente, 2000), partner characteristics such as age (Miller, Clarke, & Moore, 1997), & substance abuse (Sly, Quadagno, Harrison, Eberstein, & Riehman, 1997). Two studies found that pregnancy prevention rather than disease prevention was the impetus for condom use (Thato, Procownik, Dorn, Albrecht, & Stone, 2003; Arowojolu, Ilesanmi, Roberts, & Okunola, 2002). Health education in the form of information about pregnancy prevention increased condom use. HIV/AIDS knowledge provided to individuals did not help in generating behavior change. It was found that Nigerian undergraduates, who had very good knowledge about HIV/AIDS, had low condom use to prevent its transmission (Arowojolu et al., 2002). Further evidence of the knowledge-behavior gap came from a study, which used a random sample of students in which the level of student knowledge was very high but did not
lead to protective condom behaviors. For this group knowledge was found to be an enabling factor in maintaining a comfort level when asking partners about their sexual histories and in requesting their partners to take an AIDS test (Shapiro, Radecki, Charchian, & Josephson, 1999).

The studies mentioned chronologically in Table 2.1 explain the determinants or antecedents of safer sex in adolescents and college students and are discussed below:

The 12 studies discussed below had different focuses of study. The first two studies (Braithwaite et al., 1998; Poulson, Eppler, Satterwhite, Wuensch, & Bass, 1998) focused on condom use during oral and anal sex in a target population of African-American college students and important antecedents of risky sexual behavior such as alcohol usage and religious beliefs respectively. The first study (Braithwaite et al., 1998) emphasized the complex nature of sexual behavior among African-American college students while the second (Poulson et al., 1998) concluded that alcohol consumption had a strong link with risky sexual behavior and women with religious convictions consumed less alcohol.

Important aspects of college sexual behaviors such as differing meanings of the word monogamy, communication among students about safer sex desires and intentions to use condoms, primarily to prevent pregnancy than to prevent sexually transmitted disease, were some of the important concepts which emerged from the next study (Prince, & Bernard, 1998). The leading reasons for not using condoms were monogamy and preferring other forms of birth control. This study also brought out an important fact that unsafe sexual practices occurred on non-traditional university campuses just as frequently as they did on more traditional campuses. A model was used to explain sexual-risk taking behavior among college students in a study (Wilkinson, Iscom, & Holshan, 1998) which emphasized the importance of promoting safer sex norms among the college students. Perceived social influence and normative beliefs were
discussed as important factors when dealing with safer sex behaviors among student in this study.

Stages of change model was used by researchers in a study (Redding & Rossi, 1999) for developing general and situational self-efficacy for safer sex. This study helped in developing several internally consistent instruments for assessing self-efficacy for safer sex adoption. Furthermore it helped in measuring situational confidence in safer sex along with situational temptations for unsafe sex. A study (Lance, 2001) which looked at whether knowledge of HIV/AIDS and sexually transmitted diseases imparted to college students translated into safer sex behavioral skill, reiterated the previously known fact that knowledge and awareness of disease did not translate into action. Students did not consider themselves at personal risk of getting the disease.

Safer sexual behaviors were maintained by modifying risk factors. Some of the risk factors addressed for modification were age at first sexual intercourse, binge drinking, religious values, and number of sexual partners (Langer, Warheit, & McDonald, 2001). No significant racial or ethnic differences in the distribution of risky sexual practices were seen at the end of this study (Langer, Warheit, & McDonald, 2001). The Health Belief Model was used in a study (Boone & Lefkovitz, 2004) to hypothesize that safer sex behaviors are predicted by peer norms and sexual socialization. The researchers reiterated the fact that condom use is a protective mode of sexual behavior. In a comprehensive study (Netting, & Burnett, 2004) of sexual practices at one particular college over the previous twenty years, sexual lifestyles (subcultures) including celibacy, monogamy and free experimentation were discussed
### Table 2.1

**Determinants of safer sex in college students**

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<tr>
<th>Study</th>
<th>Purpose</th>
<th>Methods</th>
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<td>(Braithwaite et al., 1998)</td>
<td>The purpose of this study was to examine if African-American college students differed in the use of condoms during oral and anal sex.</td>
<td>A convenience sample of 1,593 undergraduate students was surveyed using paper and pencil questionnaire on items of knowledge, attitude and belief regarding HIV/AIDS and barriers to risk reduction.</td>
<td>Most respondents had engaged in oral sex without a condom. Statistically significant relationship noted between reporting being afraid to ask the partner to use a condom and past anal intercourse without a condom (p&lt;0.000)</td>
<td>Female participants were consistently more likely to use condoms during oral and anal sex than male participants. Women were 24 times more likely to engage in oral sex without a condom compared to men. Overall substantial numbers of students are placing themselves for STI and HIV/AIDS risk.</td>
<td>Important limitation was that it was not clear whether men gave or received oral sex. Preventive counseling for HIV/AIDS risk reduction behavior is essential. To reinforce condom use not only during vaginal sex but also during oral and anal sex.</td>
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<td>(Poulson et al., 1998)</td>
<td>To estimate the incidence of risky sexual behavior at a large university in conservative rural area and how drinking pattern and religiosity related to risky sexual behaviors.</td>
<td>Convenience sample of 210 participants from general student population. Survey developed in collaboration with graduate and undergraduate students and an 88 question survey was pilot tested.</td>
<td>Majority (84%) reported having engaged in sexual intercourse. Only 27% reported they consistently used condoms. 48% reported having engaged in sexual intercourse with multiple partners during past year.</td>
<td>Alcohol strongly related to risky sexual behavior. Women with strong religious convictions less likely to engage in risky sexual practices. Findings consistent with previous research.</td>
<td>Not generalizable to other college campuses. Data based on self-reports. Third variable issues when judging a causal relationship.</td>
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<td>(Prince, &amp; Bernard, 1998)</td>
<td>The purpose is to provide an overview of sexual behaviors and safer sex practices of a unique sample of college students (location and demographics different).</td>
<td>Data was obtained from, 2525 students out of which 1,919(76% response rate) completed a survey, related to sexual behaviors, safer sex practices and attitudes towards condom usage.</td>
<td>68.2% of the sexually active participants had practiced monogamy during the past year. Half of the sexually active students reported they never used condoms. Women were more likely to use HIV/AIDS communication strategies(p&lt;0.0001)</td>
<td>The percentage of participants with multiple partners was high. Only half of the participants indicated talking about HIV in every new relationship. Issue of monogamy is important in determining condom use. Positive attitudes don’t translate into safer sex behavior.</td>
<td>Study was unique in sense done on a rural commuter campus. The characteristics of sexual behavior are consistent with traditional college students. Monogamy in a year is different from serial monogamy and that is not HIV protective. HIV testing is a safer sex practice.</td>
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<td>(Wilkinson et al.,1998)</td>
<td>The purpose of this study was to develop a model of sexual-risk taking behavior that included psychological measures as well as social and demographic factors and contextual variables.</td>
<td>Use of Theory of Planned behavior which was operationalized to predict behavior. All psychological measures were used in a multiple logistic regression analysis to predict the behavior. Socio-demographic, belief and contextual variables were used to predict subjective norms</td>
<td>Practice of safer sex was associated with attitudes towards, condom use, subjective norms, and normative beliefs (norms that promote safer sex). Goodness of fit index -129.77 p&lt;0.01 –model fitted data for predicting subjective norms and was 87.32 for predicting safe sex.</td>
<td>Perceived social influence was a consistent predictor across all samples and gender. Perceived control over one’s sex life was inversely related to safer sex practices. Normative beliefs were endorsed by students.</td>
<td>Social influence is an important factor when considering an intervention. Environment which promotes safer sex norms need to be nurtured.</td>
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<td>(Redding, &amp; Rossi, 1999).</td>
<td>The purpose of this study was to develop psychometrically sound general and situational scales to measure confidence in safer sex and temptation for unprotected sex.</td>
<td>395 students were recruited from a mid-size university to complete a survey. Participation was anonymous and voluntary. CSS (Confidence in safer sex) and Temptation for unprotected (TUS) scales were used.</td>
<td>ANOVA on frequency of vaginal sex with condoms and without condoms by stages of change revealed significant differences (p&lt;0.01). Various model fits were tested and the 5 correlated factor models provided best fit.</td>
<td>The discriminant validity of constructs of confidence and temptation is supported by fact that it’s different at each stage of change. Situational subscale ratings were related to subject’s stage of change and gender</td>
<td>Males had more inclination for temptation for unsafe sex than females as females put themselves in a protective mode by using contraception. Situation specific interventions may be targeted for temptation management.</td>
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<td>(Lance, 2001).</td>
<td>The purpose was to study upto what extent knowledgeable college students (regarding HIV/AIDS) engaging in protected sexual intercourse. Are there any gender differences?</td>
<td>A convenience sample of 183 college students were given a survey questionnaire (knowledge about HIV/AIDS and attitude about sexuality, questions pertaining to HIV/AIDS and unprotected sex).</td>
<td>46% of students perceived their HIV/AIDS knowledge high. Statistically significant gender difference was found (p&lt;0.05) with respect to involvement in unprotected sex. 55% of females said they never had unprotected sex.</td>
<td>Unprotected sex is widespread in heterosexual students despite adequate HIV/AIDS knowledge levels. Future research needs to be longitudinal opposed to cross-sectional to follow changes in sexual behavior and safer sex.</td>
<td>Study findings agree with previous studies</td>
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<td>(Langer et al., 2001)</td>
<td>The purpose is to identify predictors of risky sexual practices among heterogeneous sample of students and the relationships between key risk and protective factors among risky sexual behaviors.</td>
<td>Data obtained as a part of larger study on substance abuse among college students (388 undergraduate students). Classes selected by convenience sampling. Nine risk factors and five protective factors selected from prior literature review.</td>
<td>Six of the nine risk factors and four of five protective factors were significantly correlated with scores on risky sexual behavior. Age, age at first sex, number of sex partners in last 6 months, age at first alcohol use and binge drinking -22.1% of total variance.</td>
<td>Some of these findings were consistent and some inconsistent with reported literature. Age at first sex, number of partners and early alcohol use can be foci for preventative efforts. Reliance on risk factors until more comprehensive theoretically driven models are done and tested.</td>
<td>Terminology for risk communication may differ among samples and results may not apply to other samples.</td>
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<td>(Boone, &amp; Lefkovitz, 2004)</td>
<td>The purpose of this study was to hypothesise safer sex behaviors (using condoms at intercourse) would be predicted by peer norms and sexual socialization in addition to original variables established by Health Belief Model.</td>
<td>220 individuals completed a survey. The sample size was 154. The measures used were perceived vulnerability to AIDS, condom use self-efficacy, outcome expectancies for condom use, peer norms for condom use and sexual behavior.</td>
<td>Older individuals reported reported more frequent sexual intercourse without a condom (p&lt;0.001). Females who reported less frequent alcohol use before or during sex used condoms frequently. Condom use among females was due to higher self-efficacy and positive outcome.</td>
<td>By including peer-norms and sexual socialization variables this model explained 28% of variance in lifetime condom use and 14% of variance of lifetime alcohol use before or during sexual intercourse. Condoms were protective.</td>
<td>Limited generalizability. Cross-sectional design so causality can’t be established. Associations between sexual attitudes, condom and alcohol use should be studied in detail in future.</td>
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<td>(Netting, &amp; Burnet, 2004)</td>
<td>The purpose is to examine sexual behavior at a Canadian college over past twenty years and evolving behavioral norms of subcultures</td>
<td>Students at OUC college were surveyed 1980, 1990, and 2000 about sexual behaviors by questionnaires.</td>
<td>Unmarried sexually experienced who always used condoms increased from 30% to 52% (1990-2000).</td>
<td>There was a gradual shift to committed relationships and increased condom usage over 20 yr period.</td>
<td>Good study but results may not be generalizable. Subculture trends identified.</td>
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<td>(Opt, &amp; Loffredo, 2004)</td>
<td>To study students knowledge and behavior regarding HIV/AIDS</td>
<td>Survey focusing on demographics, HIV/AIDS knowledge and perceptions, testing behaviors and sexual practices</td>
<td>Women considered HIV/AIDS a more serious problem for college students than men (p&lt;0.01). The majority were quite knowledgeable concerning topic of HIV/AIDS (lack of cure, condom use etc). Majority (54%) of the sample were not tested for HIV. 86.7% had engaged in some form of sexual activity and 35% of sexually active said they always used condoms.</td>
<td>Confirm previous findings that knowledge about HIV/AIDS doesn’t translate into taking appropriate safer sex precautions (always using a condom). Ethnicity related to more personal concerns. Intervention strategies for HIV testing – focus on younger students</td>
<td>Limited generalizable. Survey not pretested. Mostly categorical data hence non-parametric, less powerful analysis</td>
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<td>(Mwaba, &amp; Naidoo, 2005)</td>
<td>To determine sexual behavior and attitudes of sample of South African university students towards premarital sex and condom use</td>
<td>Research tool was several anonymous questionnaires for 153 black undergraduate psychology students. Topics were demographics, health seeking behavior, knowledge of STI’s and attitude towards sex.</td>
<td>94% reported willingness to talk to their partners about condom usage. 88% reported that they would refuse to have sex if partner didn’t use a condom. 79% reported that they would be able to use condoms every time they had sex.</td>
<td>Sexual practices, attitude towards condom usage and premarital sex indicate healthy sexual relationships. Good knowledge of risks of unprotected sex doesn’t lead to engaging in safer sex behaviors</td>
<td>.Results not generalizable. Self-report a limitation</td>
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<td>(Sunmola, 2005)</td>
<td>The aim of this study was to analyze the link between barriers, sexual behavior and condom use of sample of Nigerian university students.</td>
<td>Random sampling was used to anonymously survey undergraduate university students (96 female and 128 male) on demographics, substance use, sexual behaviors and condom use</td>
<td>45% of women reported they had only one sexual partner and 30% of men reported they had one partner. Majority of women (72%) and men (50%) had used condoms in two weeks preceding survey.</td>
<td>One should counter the barriers for condom usage. The predictors of condom use are: procuring condoms from clinics and perception that they do not cause health problems.</td>
<td>HIV prevention intervention should develop strategies to control for condom use barriers. Findings should be generalizable to non-university students.</td>
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This study involved a cross-sectional design with multiple surveys done at intervals of a decade and showed a steady increase in safer sexual practices over a twenty year period. The discoveries of these subcultures were important from the point of providing health education messages. The next study (Opt, & Loffredo, 2004) focused on the knowledge-behavior gap, and perceived invulnerability. Some of the other concepts which emerged from this study were ethnicity as a factor determining personal concern, and reactive rather than proactive approaches to HIV/AIDS testing.

In an interesting study (Mwaba, & Naidoo, 2005) done among South African students to understand their sexual practices and attitudes towards premarital sex, it was seen that a high percentage of male and female students would refuse to have sex if their partner was unwilling to use a condom. The translation of attitudes into safer sexual behaviors was a question of concern. In another study (Sunmola, 2005) which tried to assess sexual behaviors in Nigerian undergraduate students, access to condoms and barriers to condom use were found to be two determining features of condom use at last intercourse for both the sexes. Strategies for negotiating condom use barriers along with reducing perceptions that condom can cause health problems need to be developed in future.

Determinants of safer sex in African American adolescents and college students

The literature on determinants of safer sex or HIV/AIDS in African-American college students or adolescents was limited. In the African-American community and especially among adolescents, parental influences played an extremely important role in shaping sexual attitudes and behaviors (Pequegnat, & Szapocznik, 2000). A study which tried to replicate these results in a traditional black college found conservative sexual attitudes and, better parental-teenage communication and fewer sexual risky behaviors among adolescents and young adults.
In an interesting study to look at preadolescent sexual risk situations in low income African-American families, data was collected on parental monitoring and preadolescent sexual situations. Parental monitoring was found to be an important determinant of controlling preadolescent sexual risk. (Baptiste, Tolou-Shams, Miller, McBride, & Paikoff, 2007).

Parent-associated factors were also found important in pregnant inner-city African-American adolescents (Crosby, Diclemente, Wingood, Rose, & Lang, 2003). In an older population of African-American females, some of the factors identified were partner influences and gender-related factors (Wingood, & Diclemente, 1998). Partner characteristics such as age of the partner while having intercourse was an important determinant of adolescent African-American sexual risk (Miller, et al, 1997). Some other factors such as religiosity were found to be important determinants of safer sex behaviors such that adolescent females who exhibited engagement in spiritual activities had higher self-efficacy (confidence in performing behavior) in communicating with new as well as steady male partners about HIV/AIDS sexually transmitted diseases refusing unsafe sexual activities (McCree, Wingood, DiClemente, Davies, & Harrington, 2003) and having fewer sexual partners outside a romantic relationship (Miller, & Gur, 2002).

Adolescents and young adults especially considered themselves immune to sexually transmitted diseases or HIV/AIDS. A group of African-American adolescents were asked about their perceptions of cultural competence related to vulnerability and resilience to HIV/AIDS. Factors that contributed to susceptibility to HIV/AIDS were image, music/drug culture and peer pressure whereas resiliencies were due to confidence, safe social activities and innocence (Glenn, & Wilson, 2008). An emerging theme of being invincible along with negative views about
condom usage, trust issues and living for the moment were barriers for engaging in safer sex behaviors among a group of well studied African-American college students (Duncan et al., 2002). Students at a historically black college were asked about their perceptions of susceptibility to HIV/AIDS, the influence of the college environment on engaging in risky sexual behaviors and gender differences related to condom negotiations. Some of the important focus group findings from this study touched upon issues such as gender ratio imbalance, and women having less power than men within sexual relationships. Men emerged as the dominant group while women submitted to this dominance by having lesser control over the sexual relationship (Owens, Crouse, Eng, & Sandelowski, 2006). Although this kind of male dominance was present, female adolescents with higher safer sex self-efficacy skills and having less concerns about partners negative emotional reactions to condom negotiation had greater refusal skills to unsafe sexual behaviors (Sionean et al., 2002).

Adolescents taking sexual risk despite knowing the consequences of their action were indicated by the phenomenon of ‘Optimistic bias’ (Weinstein, 1980). In the context of African-American adolescents it was evident that they perceived their peers became sexually active at early ages and engaged in risky sexual behaviors. Optimistic bias, which was largely understudied in African-American adolescents has been touted to be the very reason for the awareness- behavior change gap (Chapin, 2001). There is a definite threat to African-American community especially the adolescents and college students as they perceive themselves as invulnerable (not getting infected with sexually transmitted diseases or HIV/AIDS). When this threat was compared and contrasted with that of the white college students, active African-American students reported more condom use and greater intentions to use condoms or other safer sex practices in the future than white college students. So there existed some key
differences in current and future sexual practices between these two groups (Davis, Sloan, MacMaster, & Kilbourne, 2007).

Differences in sexual practices, in terms of increased condom usage, and higher monogamous relationships were found in allied health college students from historically black colleges or universities when compared with traditional African-American students across different university campuses. The allied health curriculum having more HIV educational content was conjectured as a possible explanation for these findings (Valentine, Wright, & Henley, 2003).

The antecedents and correlates of risky sexual behaviors were studied in transgender adolescents. There were some differences between these and the antecedents in African-American adolescents and college students. Some of the correlates established for transgender adolescents/young adults in an ethnic minority study were lower self-esteem, less social support, and poor sex communication skills (Garofalo, Osmer, Sullivan, Doll, & Harper, 2007).

Theoretical mediators were factors that impact adoption of safer sex behaviors in adolescents and young adults. Some of the mediators identified in the past, especially among the African-American adolescent population were intentions to use condoms, self-efficacy for condom use and condom negotiation (DiClemente, 1991; DiClemente&Wingood, 1995; Fishbein et al., 2001). A study which looked at the role of self-esteem in relation to risk of sexually transmitted disease theoretical mediators( such as condom attitudes , perceived barriers to condom use and self-efficacy for condom negotiation), revealed significant associations between self-esteem and these theoretical mediators(Salazar et al.,2005). Some of the other mediators delineated using the information-motivation-behavior skills model were found to be knowledge of HIV/AIDS, positive experiences or attitudes towards condom usage and greater behavioral skills (Bazargan, et al, 2000).
Review of interventions for safer sex among adolescents and college students

Review of intervention literature for safer sex among college students revealed a total of nine studies that could be identified in the last 18 years which used some kind of intervention strategy to change attitudes and behaviors of college students towards safer sex. The dearth of intervention literature in the population of college students is surprising. All the nine studies used an experimental design in their interventional approach. Four out of the nine studies (Labrie, Pederson, Thompson, & Earleywine, 2008; Fisher, Fisher, Misovich, Kimble, & Maloy, 1998; Kiene, and Barta, 2006; Singh, 2003) identified, used the information-motivation-behavioral skills enhancement model (IMB) and motivational component as a part of safer sex promotion tool. The remaining five studies used various interventions (Bryan, Aiken, & West, 1996), normative feedback (Chernoff, and Davison, 2005), information about safer sex (Ploem, and Byers, 1997), condom promotion videotape (Sanderson, and Yopyk, 2007), and a comprehensive health education program (Turner, Korpita, Mohn, & Hill, 1993).

It seems that the IMB was the most popular model utilized with college students to promote safer sex behaviors. The information-motivation-behavioral skills approach in HIV/STD prevention is based on the premise that most individuals at risk of getting infected have inadequate information about preventive behavior, insufficient preventive behavior and inadequate behavioral skills to practice preventive acts. Hence this theory targets information, motivation and behavioral skills as critical targets for change intervention. Elicitation-intervention-evaluation strategy is blended with this model (Fisher, 1997). This model was well validated in over 15 years of research with diverse populations and in cross-cultural settings (Fisher, & Fisher, 2000). It had also shown promise in adults where it built skills for risk reduction along with lower rates of unprotected intercourse and fewer sexually transmitted
infections. Literature on using this model also supported a full model usage against a single component such as information only. (Kalichman et al., 2005; Cornman, Schmiege, Bryan, Benziger, & Fisher, 2007).

Also what was evident from this review was that despite use of theory based predictors for safer sex such as social cognitive variables (Raj, 1996; O’Leary, et al., 1992) and health belief model constructs(Boone, and Lefkowitz, 2004), no evaluation of a theory-backed intervention for safer sex among college students could be extracted. Using a theoretical framework was essential when devising interventions as this provided a common language of views and ideas across researchers in safer sex and HIV prevention research. These can be then further explored or rejected (Beaty, et al., 2004). Table 2.2 shows chronologically the interventions for promoting safer sex in college students.

Review of interventions for safer sex and HIV/AIDS prevention in African-American adolescents and college students

Theory-backed interventions which means interventions which used a particular kind of theoretical framework or construct could be called the most significant contribution of health scientists or behavioral researchers in health promotion and disease prevention (Smedley, & Syme, 2001). It was important to use a theory-backed intervention as it helped to explain the ideas, constructs, processes used by a researcher for further exploration, criticism or evaluation by other researchers. In a meta-analysis which looked at experimental as well as quasi-experimental socio-behavioral interventions to prevent HIV/AIDS among African-Americans it was found that 57% of the studies did not report a theoretical intervention and were found to be short-lasting (Semann et al., 2002).
### Table 2.2

**Interventions for promoting safer sex in college students**

<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Intervention/Design</th>
<th>Salient results</th>
<th>Conclusion</th>
</tr>
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<tbody>
<tr>
<td>(Turner et al., 1993).</td>
<td>The purpose of this study was to assess sexual behaviors of college students following a comprehensive health education intervention</td>
<td>This was a non-randomized controlled trial where participants either received a comprehensive health education intervention (didactic lectures, small group discussions, prevention strategies for safer sex) or no seminar intervention.</td>
<td>Experimental group men reported a statistically significant increase in sexual abstinence (p&lt;0.05). Number of experimental group women who reported always using condoms increased compared to control group women who showed a decrease. The difference at 3 months was significant (p=0.05).</td>
<td>A comprehensive health education intervention among college students can successfully alter sexual risk behaviors towards safer sex behaviors such as increased condom usage and sexual abstinence.</td>
</tr>
<tr>
<td>(Bryan et al., 1996)</td>
<td>The purpose of this study was to hypothesise that condom promotion intervention will produce changes in correlates of condom use as per the psychosocial model</td>
<td>Randomized experimental design. Participants either received one 45-min multicomponent safer sex intervention or one 45-min stress management intervention unrelated to STDs</td>
<td>Univariate ANCOVAs (Analysis of covariance) showed significant effects in predicted directions for all constructs except susceptibility and severity (p&lt;0.001). At 6-weeks-more participants in experimental group carried condoms (p&lt;0.01), told partners to use condoms (p&lt;0.05), increased condom use at last intercourse (p&lt;0.05).</td>
<td>The intervention increased intervention to use condoms at posttest as well as 6 weeks and 6 months later. A one-time intervention with no booster sessions induced behavioral change that was maintained even 6 months after intervention</td>
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Table 2.2 Continued

*Interventions for safer sex in college students*

<table>
<thead>
<tr>
<th>Study</th>
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</tr>
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<tbody>
<tr>
<td>(Ploem, &amp; Byers, 1997)</td>
<td>The purpose of this study was to assess the effect of two AIDS risk reduction interventions on college women's AIDS related knowledge, attitudes towards condom and actual condom use at one month follow-up period</td>
<td>Participants were randomly assigned to information group, combination group and pretest-posttest control groups</td>
<td>MANCOVA (Multiple analysis of covariance) were conducted followed by univariate analysis of covariance. Combination group had significantly more positive attitudes towards condom use than information group. A significant interaction between intervention and change in condom use was found (p&lt;0.002).</td>
<td>An intervention supplementing AIDS information with condom eroticization, condom normalization and communication skills training showed a sustained effect at improving attitudes and sustained use of condoms</td>
</tr>
<tr>
<td>(Fisher et al., 1998)</td>
<td>The purpose of this study is to design, implement and evaluate an AIDS risk reduction intervention among college students</td>
<td>Pre and post experimental design was used and the intervention consisted of three 2-hr sessions using the information-motivation and behavioral skills model. (IMB model)</td>
<td>The IMB model significantly affected scores on both indicators of the information construct, the motivation construct and the behavioral construct at individual and group level (p&lt;0.0001). Condom use increased significantly along with discussion about AIDS preventative behaviors</td>
<td>Findings from the use of this IMB model were consistent with model’s emphasis on identifying empirically identified deficits in AIDS risk reduction information, motivation and behavioral skills in efforts to change behavior.</td>
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Table 2.2 Continued

*Interventions for safer sex in college students*

<table>
<thead>
<tr>
<th>Study</th>
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<tbody>
<tr>
<td>(Singh, 2003)</td>
<td>The purpose of this study was to examine the effect of an intervention</td>
<td>3 sessions (information, motivation and behavioral skills) of intervention program</td>
<td>Analysis of covariance was used for analysis which showed the following results: Personal and social motivation to engage in AIDS risk reduction behavior increased considerably (F=174.49) and there was a reduced perceived difficulty to engage in AIDS risk reduction (F=65.92) and also engagement in AIDS risk reduction behavior increased significantly (F=134.96).</td>
<td>The findings in the present research shows that information, motivation and behavioral skills essentially contribute to AIDS risk reduction behavior</td>
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<td></td>
<td>based on information-motivation – behavioral skills to facilitate AIDS</td>
<td>were given to participants in the experimental group and the control group without intervention</td>
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<td></td>
<td>risk reduction behavior among college/university students</td>
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<tr>
<td>(Chernoff, &amp; Davison, 2005)</td>
<td>The purpose of this study was to develop and evaluate a brief intervention using normative feedback in order to increase risk-reduction among college students</td>
<td>Participants were assigned to the intervention group (normative feedback and goal setting instrument) and control group (information related to AIDS prevention)</td>
<td>MANCOVA (multiple analysis of covariances) were significant for condom usage for vaginal intercourse (p&lt;0.001), number of sexual partners (p&lt;0.001), and discussion of safer sex (p&lt;0.001). Women in the intervention group reported significantly fewer partners at follow-up.</td>
<td>Men in the intervention group reported a significant increase in condom usage with vaginal intercourse whereas unexpectedly women showed a significant reduction in the number of partners. The second effect was not expected given the brevity of the intervention</td>
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Table 2.2 Continued

*Interventions for safer sex in college students*

<table>
<thead>
<tr>
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<th>Purpose</th>
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<tr>
<td>(Kiene, &amp; Barta, 2006)</td>
<td>The purpose of this study was to develop and evaluate a computer-delivered theory-based tailored HIV/AIDS risk reduction intervention</td>
<td>The experimental group had an HIV prevention intervention which was based on the information, motivation and behavioral skills model while the control group a nutrition education tutorial</td>
<td>Analysis of covariance was used which yielded the following important findings: Treatment group showed an increase in frequency of condom use information compared to the controls (P&lt;0.01). There was also an increase seen in the frequency of condom usage.</td>
<td>This IMB (Information-motivation-behavioral skills model based computer tailored intervention showed increased condom use knowledge and preparatory sexual behaviors.</td>
</tr>
<tr>
<td>(Sanderson, &amp; Yopyk, 2007)</td>
<td>The purpose of this study was to examine the effectiveness of two condom promotion videotapes on self-efficacy, intentions and behavior</td>
<td>Participants were randomly assigned to receive one of two 30-min condom promotion videotape or to a wait-list control condition. This study had an immediate and 4 month follow-up</td>
<td>Analysis of covariance was conducted. Self-efficacy for suggesting condom use to a partner showed significance (p&lt;0.03). Refusal to have sex without a condom showed significant effect of condition (p=0.03) and also intention to use condoms showed significant effect of condition (p=0.03).</td>
<td>Condom promotion videos may be a useful way of increasing self-efficacy for condom use and intention to use condom and reported condom use behavior among college students.</td>
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</table>
### Interventions for safer sex in college students

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>(Labrie et al., 2008)</td>
<td>The purpose of this study was to determine if decisional balance with motivational interviewing promotes safer sex practices during one meeting.</td>
<td>Within–subjects design was used and participants were randomly assigned to safer-sex intervention group or alcohol-target intervention group. Decisional balance motivational enhancement intervention</td>
<td>Participants significantly increased their condom use scores from baseline at post-intervention (p&lt;0.001) and at 30-day follow up (p&lt;0.001). Forty percent who used condoms less than ninety percent of times showed 100% usage.</td>
<td>The decisional balance intervention helps in increasing motivation to change risky sexual behavior among college students.</td>
</tr>
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</table>
It was extremely important in building theories to prevent HIV/AIDS among African-American youth to tailor them towards their needs and make them culture specific (Prendergast, Urada, & Podus, 2001). Some of the strategies suggested to deliver a culture-specific and culturally competent behavioral intervention among African-American adolescents and young adults were use of African-American female peer educators to communicate credible information and have positive acceptance (Jemmott, 2003)

Other strategies used in the past included popular communication vehicles such as music videos, psychodramas, rap songs to disseminate HIV/AIDS preventive behaviors promoting safer sex strategies (Wingood, & DiClemente, 1992). There was an attempt to build a model around popular ‘hip hop’ music culture as an HIV/AIDS prevention intervention. The focus on culture-centric information and preventive messages along with decision-skills building was the basis for this model development (Stephens, Braithwaite & Taylor, 1998). There was a growing importance of ‘structural’ interventions which referred to interventions that work or help in altering the context within which health is produced (Blankenship, Bray, & Merson, 2000).

These interventions in the context of HIV/AIDS prevention were classified into subcategories of availability interventions, accessibility interventions and acceptability interventions targeted at individual, organizational and environmental levels (Blankenship, et al., 2000). Although these interventions tended to use an ‘ecological’ kind of framework in HIV/AIDS prevention among the African American population, challenges such as documenting structural and environmental factors(Parker, Easton, & Klein, 2000)and getting long term funding for sustainability remained (Beaty, et al., 2004). Evaluation of HIV/AIDS prevention interventions from the point of sustained behavioral change has met with some success with African-American adolescents at 12
Interventions for promoting safer sex behaviors in African-American adolescents have used multiple cognitive-behavioral theories such as social cognitive theory, theory of reasoned action and planned behavior (Jemmott, Jemmott, & Fong, 1998; Jemmott, Jemmott, Braverman, & Fong, 2005), or a safer sex educational program (Scheck, 1999) which was atheoretical. In a meta-analytic review of HIV/AIDS behavioral interventions conducted among heterosexual African-Americans over a 17 year period found that interventions which incorporated peer education and aimed to influence social norms were highly efficacious. Furthermore with few exceptions, it was seen that majority of these studies were based on behavioral change theories such as Social Cognitive Theory, Information-Motivation-Behavioral Model. Although this review is based on adults as well as adolescent studies, it gives us a broad picture of interventions used in this population (Darbes, et al., 2008). A similar review, but in a target population of black and Hispanic sexually transmitted disease clinic patients favored the use of the AIDS risk reduction model, Social Cognitive Theory and Information-Motivation-Behavioral Skills Model (Crepaz et al., 2007). In a randomized-controlled trial where the participants were African-American and Mexican adolescents, a behavioral intervention based on safer sex awareness, greatly reduced risky sexual behaviors among adolescents compared to the control group (Thurman, Holden, Shain, Perdue, & Piper, 2008).

An HIV prevention intervention which focused solely on African-American adolescent girls used the services of a trained female African-American health educator in delivering an ethnically competent intervention (strategies included HIV/AIDS risk reduction and confidence building in initiating safer sex). Results indicated increased condom usage, fewer sexual
partners, decreased pregnancy rates and increased HIV knowledge and attitudes as compared to the control group (Diclemente et al., 2004). Emphasis on making this intervention culturally-tailored for these young participants was important considering the favorable results. It was also important to do a process evaluation when designing a culturally appropriate intervention. A process evaluation of a behavioral intervention done among predominantly African-American heterosexual adolescents found that interventional activities such as sequential learning, game formats and peer facilitators were engaging, relevant and worthwhile (Richey, Gillmore, Balassone, Gutierrez, & Hartway, 1997).

In a study which used qualitative formative research methods to develop culture-centric mass media HIV/AIDS prevention messages among African-American adolescents, the messages primarily focused on barriers for safer sex practice such as social pressure for early initiation of sexual intercourse and on clearing the misperceptions that condom use reduces sexual pleasure. This study focused on how ‘competing narratives’ identified in the analysis conducted can be featured in radio or television messages advocating risk-reduction and healthy behavior (Horner et al., 2008). In another qualitative study which looked specifically at the sexual decision making process among African-American college women, researchers implied that HIV prevention messages should take into account the type of sexual arrangements on sexual behavior. A thematic analysis was conducted in which using ‘self-defined’ sexual arrangements hierarchy. The various rungs in this hierarchy were ‘wham-bam’, ‘casual’, ‘homie-lover friend’ and ‘long term’. So the conclusion of this study was that women employ both emotional and philosophical strategies to determine their safer sex behaviors and value different types of sexual arrangements from casual to committed (Foreman, 2003).
Review of instrumentation studies related to safer sex in college students

Psychometrically valid and reliable instruments were used in studies addressing parent-adolescent communication and safer sex behaviors among college students (Lehr, Dilorio, Dudley, and Lipana, 2000). Constructs of extended Health Belief Model were tested psychometrically in predicting safer sex intentions of juvenile delinquents (Lux, & Petosa, 1994) and situational self-efficacy for safer sex (Redding, & Rossi, 1999) was tested among college students successfully in the past. Self-efficacy scales were tested in the past to disclose HIV status of sex partners and negotiating safer sex among HIV/AIDS affected individuals with some success (Kalichman et al., 2001). Safer sex strategies used by male sex workers were measured by validating an instrument based on Browne and Minichiello in an Australian study (Marino, Browne, & Minichiello, 2000). No valid and reliable instrument had been developed which used the five constructs of social cognitive theory among African American college students, as did the current.

Social Cognitive theory and safer sex behaviors

Social Cognitive theory posits that human behavior can be explained as a triadic reciprocal causation. One part of this triad consists of behavior, the second part consists of environmental factors, and the third part consists of personal factors such as cognitions, affect and biological events. The interaction among these three dimensions results in behavior change. (Sharma, & Romas, 2008).

It was in 1962, that Bandura published an article on social learning and imitation (Bandura, 1962). The Social Learning Theory (Bandura, & Walters, 1963) described the existence of three important influences on learning such as imitation, reinforcement patterns and self-control (Sharma, & Romas, 2008). In 1986, Bandura published a comprehensive framework for
understanding human social behavior and renamed Social Learning Theory as Social Cognitive Theory (Bandura, 1986). About ten years later delineated the role of the constructs that accounted for largest variance in work with this theory in a book by the name ‘Self-Efficacy in Changing Societies (Bandura, 1995). This theory described five basic human capabilities such as symbolizing capability, vicarious capability, forethought capability, self-regulatory capability and self-reflective capability (Sharma, & Romas, 2008).

Some examples in which Social Cognitive Theory has been applied for primary prevention has been used in HIV prevention programs in adolescents, nutrition education program, smoking cessation programs and problem solving skills. Another group of examples where SCT is used in secondary and tertiary prevention are diabetes education program, promotion of female condom use in a sexually transmitted disease clinic and dietary approaches to reducing hypertension (Sharma, and Romas, 2008). The limitations of using this theory were a) that it was more applicable to children being a learning theory, b) that it was not specifically a behavior change theory (like the stages of change theory) c) that this theory had many constructs making its reification difficult, d) that it targeted individuals who were already prepared for behavior change (Sharma, & Romas, 2008).

Table 2.3 adapted from the book ‘Theoretical Foundations of Health Education and Health Promotion (Sharma, & Romas, 2008), provides definition of various constructs related to Social Cognitive Theory.

Some of the social cognitive factors associated with consistent condom use and safer sex intentions in heterosexual college students were higher HIV risk perceptions, positive attitudes towards condom usage, safer sex negotiation, safer sex perceptions of self-efficacy, and fewer negative outcomes of condom use. (O’Leary, et al., 1992; Raj, 1996). Self-efficacy skills and
expectancies to use condoms were the two variables which emerged. (Strader & Beaman, 1991; Wulfert, & Wan, 1995).

In another application of social cognitive theory in determining factors that predict condom self-efficacy among adult male inmates results revealed that the strongest predictor of self-reported condom self-efficacy was requesting that partner uses condoms every time sex occurred. The other important predictors were limiting the number of sexual partners and asking partner’s HIV status (Stephens, Braithwaite, Conerly, & Brantley, 2006). In a mixed model study where social cognitive theory tenets were the basis of a brief male-centered condom promotion program among African-American young adults, findings such as condom use efficacy and partner communication gave some credence to use of a social cognitive model (Kennedy, Nolen, Applewhite, & Waiter, 2007).

In an interesting study conducted among a large sample of ethnically diverse adolescents, the researchers hypothesized on the basis of social cognitive theory that exposure to televised sexual content would influence adolescents self-efficacy for safer sex, sex-related outcome expectancies and perceived peer norms for sex. Self-efficacy was found to be a significant mediator whereas outcome expectancies and perceived peer norms were thought to be probable mediators (Martino, Collins, Kanouse, Elliott, & Berry, 2005). Similarly, assessments regarding relation between self-concept and unwanted unprotected sex refusal were done in the light of theoretical models such as social cognitive theory and theory of gender and power, in a target population of African- American adolescent girls.

Self-efficacy for condom use negotiation was found to be a good indicator of partner communication (Salazar et al., 2004). Structural equation modeling was used to test the theoretical models in both the above studies.
Table 2.3

*Important constructs of Social Cognitive Theory*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Knowledge</td>
<td>Learning facts and gaining insights related to an action, idea, object, person, or situation</td>
</tr>
<tr>
<td>Outcome expectations</td>
<td>Anticipation of the probable outcomes that would ensue as a result of engaging in the behavior under discussion</td>
</tr>
<tr>
<td>Outcome expectancies</td>
<td>Value a person places on the probable outcomes that result from performing a behavior</td>
</tr>
<tr>
<td>Situational perception</td>
<td>How one perceives and interprets the environment around oneself</td>
</tr>
<tr>
<td>Environment</td>
<td>Physical or social circumstances or conditions that surround a person</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Confidence in one’s ability to pursue a behavior</td>
</tr>
<tr>
<td>Self-efficacy in overcoming impediments</td>
<td>Confidence that a person has in overcoming barriers while performing a given behavior</td>
</tr>
<tr>
<td>Self-control or Goal setting</td>
<td>Setting goals and developing plans to accomplish chosen behaviors</td>
</tr>
<tr>
<td>Emotional coping</td>
<td>Techniques employed by the person to control the emotional and physiological states associated with acquisition of a new behavior</td>
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</table>
The use of social cognitive theory as a theoretical basis for devising interventions related to safer sex or HIV/AIDS prevention was used in a multi-site HIV prevention trial. The purpose of this intervention was to improve outcome expectations of condom use and self-efficacy for safer sex behaviors. The measure of these constructs was found to be higher at three months in the intervention arm as opposed to the control arm (O’Leary et al., 1998). Although this outcome was desirable just two constructs of the social cognitive theory were used and a lot of the behavior remained unexplained. These two constructs were often studied to explain safer sex behaviors and condom use intentions. Adolescents with positive outcome expectancies or positive attitudes about condom usage were more likely to use condoms (Reitman et al., 1996; Sieving et al., 1997; Dilorio et al., 2001).

In a study which tried to look at the role of social cognitive correlates in determining the relationship between partner type and sexual risk behaviors, unprotected anal intercourse was inversely related to outcome expectancies for negotiation of safer sex for men with steady partners, with self-efficacy for condom use and self-efficacy for negotiation (Semple, Patterson, & Grant, 2000). Constructs of social cognitive theory were used in a limited sense to explain safer sex behavior and/or condom usage among Bolivian truck drivers. Outcome expectations and perceived social norms were the predictive components of this study (Sorensen, Anderson, Speaker, & Vilches, 2007).

Self-efficacy that is perceived self-efficacy can be enhanced or improved by various techniques such as persuasion, careful explanation, encouragement, rehearsal and practice. The challenge for behavioral scientists was in promoting self-efficacy enhancement in discussions of sexual desires and safer sex behavioral practices with peers, friends and partners. Role play and
visual modeling were some of the techniques which could be used in improving safer sex
discussions with partners (Wight, Abraham, & Scott, 1998).

Conclusion and Summary

The salient points about the literature review conducted about determinants of safer sex
among adolescents and college students were that factors such as alcohol usage, religiosity, and
condom use barriers such as decreased sexual satisfaction and reduced sexual interest and
perceived social influence needed to be addressed when targeting college students with safer sex
interventions. When it comes to African-American adolescents and college students, some new
determinants of safer sex, such as parental communication, partner characteristics, phenomenon
of ‘optimistic bias’, invincibility and gender ratio imbalance emerged. Some theoretical
mediators relevant to this discussion were found to be attitudes towards condom use, condom use
self-efficacy, and condom negotiation. The knowledge-behavior gap which was seen across a lot
of studies probably was related to the perception of invulnerability among African-American
adolescents and probably could be translated to other adolescents as well.

A review of interventions related to safer sex in adolescents or college students over a period
of 18 years, it was seen that the IMB was the most popular model utilized with college students
to promote safer sex behaviors. Review of interventions related to safer sex in African American
adolescents or college students showed an overall lack of theoretical basis. Interventions which
used a theoretical background often used multiple cognitive-behavioral theories. A lot of
importance was given to making these interventions culture-centric. Evaluation of these
interventions over long periods showed some success.
Chapter 3

Methodology

The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college students.

The current study used five constructs of the social cognitive theory including expectations for safer sex (outcome expectations x outcome expectancies), situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self-control for safer sex. The knowledge construct of the social cognitive theory was not used as it was believed that college students had a good knowledge about HIV/AIDS and sexually transmitted diseases along with use of safer sex behaviors to prevent getting a disease. The environment construct was also not used in this study as it is difficult to modify the physical and social circumstances of individual participants.

A parsimonious model was used in this study which included five constructs from social cognitive theory. The numbers of constructs were more than the number of constructs used in any of the previous studies related to safer sex (Strader & Beaman, 1991; Wulfert, & Wan, 1995). Along with the Information-Behavioral-Skills model, Social Cognitive Theory has been used in the past in reducing HIV risk behaviors and sexually transmitted diseases in heterosexual African-Americans (Darbes, et al., 2008; Semann et al., 2002). Furthermore brief interventions in African-American adolescents especially in school-based and community settings have been effective in the past in promoting safer sex behaviors (Ickes, & Sharma, 2007). Hence, the current study tests a social cognitive theory based brief intervention for safer sex behavioral change among a target population of African-American college students.
This chapter begins with the description of the study in two phases: 1) The first part of the chapter describes the process of developing instrumentation for this study 2) The second part provides a description of the research design for the brief intervention study, the rationale for its choice, the population for this study, the sample and sampling procedure, and participant recruitment procedure. This is followed by an explanation of the interventions—-theory-based (experimental) and non-theory based (knowledge-based) in detail. Finally the processes of data collection and data analyses are discussed.

Instrumentation

The instrumentation study was approved by the Institutional Review Board (IRB) at University of Cincinnati in March 2008 and was completed in August 2008. For developing the instrument six self-report scales were developed for constructs of social cognitive theory that included situational perceptions about safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, expectations for safer sex, self-control for safer sex and safer sex behaviors. The initial safer sex survey instrument was a 46-item instrument. Instrument items were generated from the review of literature. There were six-items which measured safer sex behaviors, five-items which measured self-efficacy for safer sex, four-items which measured self-efficacy towards barriers for safer sex, and five-items which measured situational perceptions for safer sex. There were seven items each for outcome expectations and outcome expectancies respectively and five-items for self-control for safer sex. A demographics section included seven-items.

Content validity, face validity and readability of the items under each self-report scale was established by a panel of six experts and the researcher in a two-round review process (The first round involved submitting the instrument to the panel of experts along with a letter indicating
what was expected of them in clear terms i.e. commenting on choice of items and scaling method in the attached instrument. The second round involved making the necessary modifications as per round one and submitting the revised instrument for further review (See APPENDIX A- Copy of Letter to Subject Experts). The panel consisted of four university professors with expertise in instrument development, subject matter, social cognitive theory, and working with college students. The other two experts were target population representatives (See APPENDIX B- List of Subject Experts and target population representatives). Readability was defined as the meaning of each item being clear and language being appropriate for a college student’s reading level. Face validity was defined as the item’s ability to measure the intended construct as operationally defined (Green, & Lewis, 1986) Content validity was defined as the adequacy of the items of the scale to adequately assess each Social Cognitive Theory(SCT) construct within the universe of content as operationally defined(Green, & Lewis, 1986; Polit, & Hungler, 1991). At the end of this process, some of the items were reworded or modified as deemed necessary by the experts and three items were dropped. Readability suggestions from all experts were incorporated and consensus obtained in the second round. The final safer sex instrument had 43-items; five-items measuring safer sex behaviors, five-items measuring self-efficacy towards safer sex, four-items measuring self-efficacy towards barriers for safer sex, five-items measuring situational perceptions, six-items each for measuring outcome expectations and outcome expectancies ,four-items measuring self-control and eight-items for demographics. The demographics dealt with college students, age, gender, year in school (freshman, sophomore, junior, senior or graduate), self-reported cumulative grade point average, and history of ever having sexual intercourse, and ever being diagnosed with sexually transmitted diseases. The
participants were also asked about number of sexual partners in the last year and age at first sexual intercourse in years.

**Scoring of self-report scales**

Safer sex behaviors were measured by five items on a scale of never (1), hardly ever (2), sometimes (3), almost always (4), always (5) as measured on items 9-13 yielding a possible range of 5-25. Self-efficacy about safer sex was measured by five items on a scale of not at all confident(1), slightly confident(2), moderately confident(3), very confident(4), completely confident(5) as measured on items 14-18 yielding a possible range of 5-25. Self-efficacy in overcoming barriers for safer sex was measured by four items on a scale of not at all confident(1), slightly confident(2), moderately confident(3), very confident(4), completely confident(5) as measured on items 19-22 yielding a possible range of 4-20. Situational perceptions about safer sex was measured by a five items on a scale of never(1), hardly ever(2), sometimes(3), almost always(4), always(5) as measured on items 23-27 yielding a possible range of 5-25. Expectations comprised a combined score of outcome expectations and outcome expectancies which were then added to get the summative score. There were six items (28-33) for outcome expectations each on a scale of 1-5 & six items (34-39) for outcome expectancies each on a scale of 1-5, yielding a possible range of 6-150. Self control for safer sex was measured by four items on a scale of not at all sure(1), slightly sure(2), moderately sure(3), very sure(4), completely sure(5) as measured on items(40-43), yielding a possible range of 4-20.

**Design and data collection for instrumentation**

A convenience sample of 173 participants were invited to participate in this study. The sample size estimate was based on recommendations such that components with 10 or more low -0.40 loadings would be reliable as long as sample size was greater than 150( Stevens, 2002).
Informed consent for the participants was built into the survey instrument. There was a separate heading ‘consent and direction’ which stated that ‘your participation in this survey implies your consent’. Surveys were completed once, by 173 participants at multiple sites on the college campus in the presence of the researcher. One hundred and fifty participants (87%) had sexual intercourse at least once during their lifetime and completed all the 43 items on the survey instrument. Twenty-three participants (13.2%) completed the survey instrument partially. These 23 participants were analyzed separately. Sixty-three participants (36.4%) out of the 150 participants, who completed the survey instrument once, were asked to complete the survey instrument a second time at an interval of about 2 weeks. The participants who took the survey twice were provided with $5 cash as an incentive for completion. The survey data was destroyed after entering it in SPSS database. Only the researchers had the access to this database.

The construct validity of the scales measuring different constructs of SCT was established by confirmatory factor analysis. The dimensions that had been identified were (1) situational perception for safer sex (2) outcome expectations about safer sex (3) outcome expectancies about safer sex (4) self-efficacy towards safer sex (5) self-efficacy in overcoming barriers towards safer sex (6) self-control towards safer sex.

Two different types of factor analyses exist (Stevens, 2002): (a) exploratory and (b) confirmatory. Typically, exploratory factor analysis is used for data reduction to a smaller number of factors or to ascertain the minimum number of unobservable common factors that can account for observed correlations among variables or for exploring the underlying dimensions in a data set. If there is a hypothesis about the dimensionality of underlying factors then confirmatory factor analysis is used. In this study, since the panel of experts had suggested the dimensions apriori, confirmatory factor analysis was used.
For this purpose, the scales were administered to a convenience sample of 150 African-American college students drawn across the university campus. In calculating this sample size, the recommendation of Tabachnik and Fidel (1989, p.603) was followed “as a general rule of thumb it is comforting to have at least five cases for each observed variable.” Regarding the nature of relationship, since no previous scale for assessing safer sex behaviors based on SCT has been developed, it was not possible to specify the relationships among factors apriori. Hence both principal component analysis and maximum likelihood analysis methods were used. In the event there were two or more factors both orthogonal (Varimax) and Oblique (oblimin) rotations were done to enhance interpretability of the data. The decision to rotate both orthogonally and obliquely was based on recommendations from Pedhazur and Schmelkin (1991) and Stevens (2002). Further, SAS STAT User’s (SAS Institute, Inc., 1990) notes mention that from a statistical point, all rotations are equally good. When you rotate factors it doesn’t change the statistical explanatory power and hence for most research the preferred rotation is one which can be easily interpreted by the researcher.

Before describing the magnitude considerations used in confirmatory factor analysis, two terms need clarification: Eigenvalues and factor loadings. In principal component analysis, eigenvalue (or latent root) refers to the amount of variance in the original variable set explained by each principal component (Gorsuch, 1983; Stevens 1996). The most widely used criterion established by Kaiser (1960) retained only factors whose eigenvalues were greater than 1 (Stevens, 2002) in principal component and maximum likelihood factor analysis. The second term was factor loadings which are simply Pearson Product Moment correlations coefficients between items and factors (Stevens, 1996, 2002). Tabachnik and Fidel (1989) proposed a rule of thumb that factor loadings of 0.30 (absolute value) or higher should be used to identify variables
that load on each factor. Stevens (2002, p 394) recommended that sample size and stringent alpha should also be considered in this interpretation. According to his recommendation the minimum acceptable factor loadings for a sample size of 140 subjects and an alpha of 0.01, was determined as 2 (0.217) or 0.434. Accordingly it was decided that if the item did not have a minimum loading of 0.434 then either it would be deleted or revised. Further it was decided that scales with over 90 percent response for 43 items would be used for analyses, that is, if the data was missing on more than 5 items, the subject would be excluded from the analyses.

For determining internal consistency of the seven scales (1) measuring outcome expectations for safer sex (2) measuring outcome expectancies for safer sex (3) measuring self-efficacy towards safer sex (4) measuring self-efficacy in overcoming barriers towards safer sex (5) measuring situational perceptions towards safer sex (6) measuring self-control towards safer sex (7) measuring safer sex behaviors; Cronbach alphas were also calculated from the same sample of 150 African-American college students. An acceptable level of Cronbach alphas generated by each scale was set *apriori* at 0.70 (Polit and Hungler, 1999) (See Table 1) For test-retest reliability of the scales, a subsample of the 150 African-American college students (n=63) completed the instrument twice at an interval of one week. An acceptable level of reliability coefficient (correlation coefficient between two sets of scores) was set *apriori* at 0.70 (Polit and Hungler, 1999). The mean scores with standard deviations on various construct subscales and total safer sex behaviors are reported in Table 3.1.
Table 3.1

*Descriptive statistics on instrument scales for safer sex among African-American college students*

<table>
<thead>
<tr>
<th>Scales</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safer sex behaviors</td>
<td>150</td>
<td>5.00</td>
<td>25.00</td>
<td>20</td>
<td>14.42</td>
<td>5.206</td>
</tr>
<tr>
<td>2. Self-Efficacy for safer sex</td>
<td>150</td>
<td>5.00</td>
<td>25.00</td>
<td>20</td>
<td>16.42</td>
<td>3.419</td>
</tr>
<tr>
<td>3. Self-Efficacy towards barriers for safer sex</td>
<td>150</td>
<td>4.00</td>
<td>20.00</td>
<td>16</td>
<td>10.76</td>
<td>4.935</td>
</tr>
<tr>
<td>4. Expectations for safer sex</td>
<td>150</td>
<td>6.00</td>
<td>150.00</td>
<td>144</td>
<td>52.89</td>
<td>13.74</td>
</tr>
<tr>
<td>5. Situational Perceptions for safer sex</td>
<td>150</td>
<td>5.00</td>
<td>25.00</td>
<td>20</td>
<td>6.24</td>
<td>4.206</td>
</tr>
<tr>
<td>6. Self-control for safer sex</td>
<td>150</td>
<td>4.00</td>
<td>20.00</td>
<td>16</td>
<td>12.36</td>
<td>3.40</td>
</tr>
</tbody>
</table>

Min= Minimum Max=Maximum
It was interesting that mean scores for situational perceptions for safer sex and expectations (summation of multiplicative scores of outcome expectations and outcome expectancies) were generally on the lower side, while self-efficacy for safer sex behaviors, self-efficacy towards barriers for safer sex and self-control for safer sex were towards the higher side of the range.

For confirmatory factor analyses, since no previous scale for safer sex behaviors based on SCT has been developed, the nature of the relationship was not established a priori. Hence for confirmatory factor analyses, both principal components and maximum likelihood methods were performed on each of seven scales. The criteria of eigenvalues greater than 1.0 and factor loadings greater than 0.40 had been established a priori (Stevens, 2002). The results from the confirmatory factor analysis on the subscale measuring situational perception for safer sex are presented in Table 3.2. It was identified in the subscale by both principal components and maximum likelihood methods that more components had eigenvalues greater than 1.0. Hence a two factor solution was run using both principal components and maximum likelihood methods using Varimax and Quartimax rotations. Principal components analysis showed low factor loadings for item 1 (everyone in my age-group uses condoms) while the rest of the items had factor loadings above 0.40. It was decided to omit this item and rerun the confirmatory factor analysis with the remaining four items.

The results from this confirmatory factor analysis on the four items measuring situational perception for safer sex behaviors yielded a one factor solution. Both the criteria of eigenvalue greater than 1.0 and factor loadings greater than 0.4 were satisfied. The results of the confirmatory factor analysis on the subscale measuring situational perception for safer sex behavior yielding a one factor solution are presented in Table 3.3.
Table 3.2

Summary of Confirmatory Factor Analysis on a subscale measuring situational perception for safer sex showing a two factor solution (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>PRINCIPAL COMPONENTS</th>
<th>METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Factor1(loadings)</td>
<td>Factor2(loadings)</td>
</tr>
<tr>
<td>1. Everyone in my age-group uses condoms.</td>
<td>0.051</td>
<td>0.986</td>
</tr>
<tr>
<td>2. Being readily available</td>
<td>0.634</td>
<td>0.044</td>
</tr>
<tr>
<td>3. The place</td>
<td>0.836</td>
<td>0.068</td>
</tr>
<tr>
<td>4. The partner type</td>
<td>0.737</td>
<td>-0.169</td>
</tr>
<tr>
<td>5. The partner attractiveness</td>
<td>0.845</td>
<td>0.107</td>
</tr>
<tr>
<td>MAXIMUM LIKELIHOOD METHOD</td>
<td>-0.018</td>
<td>0.477</td>
</tr>
<tr>
<td>1. Everyone in my age-group uses condoms.</td>
<td>-0.007</td>
<td>0.781</td>
</tr>
<tr>
<td>2. Being readily available</td>
<td>-0.103</td>
<td>0.608</td>
</tr>
<tr>
<td>3. The place</td>
<td>0.029</td>
<td>0.825</td>
</tr>
<tr>
<td>4. The partner type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The partner attractiveness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.3

Summary of Confirmatory Factor Analysis on a subscale measuring situational perception for safer sex showing a one factor solution (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (loadings)</th>
<th>Eigenvalues (Variance explained by the factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINCIPAL COMPONENTS METHOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use will depend on:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Being readily available</td>
<td>0.634</td>
<td>2.359</td>
</tr>
<tr>
<td>2. The place</td>
<td>0.836</td>
<td></td>
</tr>
<tr>
<td>3. The partner type</td>
<td>0.735</td>
<td></td>
</tr>
<tr>
<td>4. The partner attractiveness</td>
<td>0.847</td>
<td></td>
</tr>
<tr>
<td>MAXIMUM LIKELIHOOD METHOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use will depend on:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Being readily available</td>
<td>0.478</td>
<td>1.886</td>
</tr>
<tr>
<td>2. The place</td>
<td>0.783</td>
<td></td>
</tr>
<tr>
<td>3. The partner type</td>
<td>0.607</td>
<td></td>
</tr>
<tr>
<td>4. The partner attractiveness</td>
<td>0.821</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.4
Summary of Confirmatory Factor Analysis on the subscale measuring self-control for safer sex among African-American college students (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor1 (loadings)</th>
<th>Eigenvalue (Variance explained by factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINCIPAL COMPONENTS METHOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How sure are you that you can?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Plan that you use condoms every time you or your partner engages in sexual intercourse.</td>
<td>0.788</td>
<td></td>
</tr>
<tr>
<td>2. Refrain from having sexual intercourse with multiple partners</td>
<td>0.467</td>
<td>2.261</td>
</tr>
<tr>
<td>3. Use condoms (after drinking alcohol)</td>
<td>0.779</td>
<td></td>
</tr>
<tr>
<td>4. Refuse to have sexual intercourse when there is no condom</td>
<td>0.903</td>
<td></td>
</tr>
<tr>
<td>MAXIMUM LIKELIHOOD METHOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How sure are you that you can?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Plan that you use condoms every time you or your partner engages in sexual intercourse.</td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td>2. Refrain from having sexual intercourse with multiple partners</td>
<td>0.315</td>
<td></td>
</tr>
<tr>
<td>3. Use condoms (after drinking alcohol)</td>
<td>0.631</td>
<td>1.898</td>
</tr>
<tr>
<td>4. Refuse to have sexual intercourse when there is no condom</td>
<td>0.989</td>
<td></td>
</tr>
</tbody>
</table>
The results from the confirmatory factor analysis on the subscale measuring self-control for the safer sex behaviors are presented in Table 3.4. Both the principal components methods and the maximum likelihood methods confirmed the presence of one factor and both the criteria of eigenvalue > 1.0 and factor loadings > 0.40 were satisfied.

The results for the confirmatory factor analysis on the subscale measuring outcome expectations for safer sex behaviors yielded a two factor solution using six items as shown in Table 3.5. Both the principal components method and the maximum likelihood method showed that more components showed eigenvalues > 1.0. Two of the items (If I use condoms at sexual intercourse at all times I will...feel satisfied and enjoy the sexual experience were found to be vague and poorly worded). These were omitted. The confirmatory factor analysis was conducted again with four items using Varimax and Quartimax rotations and a one factor solution was obtained. Both principal component method and the maximum likelihood method confirmed the presence of one factor. Both the criteria of eigenvalue greater than 1.0 and factor loadings greater than 0.40 were satisfied under both methods as shown in Table 3.6.

The results for the confirmatory factor analysis on the subscale measuring outcome expectancies for safer sex behaviors yielded a two-factor solution with six items as shown in Table 3.7. Both the principal components method and the maximum likelihood method showed that more components showed eigenvalues > 1.0. Two of the items (How important are using condoms all the time to...feel satisfied...enjoy the sexual experience were found to be vague and poorly worded). These were omitted and the confirmatory factor analysis was conducted again with four items using Varimax and Quartimax rotations giving rise to a one factor solution.
### Table 3.5

**Summary of confirmatory factor analysis on subscale measuring outcome expectations giving a two factor solution (n=150)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (loading)</th>
<th>Factor 2 (loading)</th>
<th>Eigenvalues (Variance explained by the factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINCIPAL COMPONENTS METHOD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I use condoms at sexual intercourse at all times I will</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Feel satisfied</td>
<td>0.645</td>
<td>0.689</td>
<td></td>
</tr>
<tr>
<td>2. Be healthier</td>
<td>0.713</td>
<td>-0.362</td>
<td></td>
</tr>
<tr>
<td>3. Feel protected</td>
<td>0.741</td>
<td>-0.166</td>
<td>Factor 1- 3.121</td>
</tr>
<tr>
<td>4. Enjoy the sexual experience</td>
<td>0.709</td>
<td>0.616</td>
<td>Factor 2- 1.335</td>
</tr>
<tr>
<td>5. Worry less about catching disease</td>
<td>0.711</td>
<td>-0.551</td>
<td></td>
</tr>
<tr>
<td>6. Be more confident about my sexual experiences</td>
<td>0.799</td>
<td>-0.136</td>
<td></td>
</tr>
<tr>
<td>MAXIMUM LIKELIHOOD METHOD</td>
<td>I</td>
<td></td>
<td>Factor 1- 2.745</td>
</tr>
<tr>
<td>1. Feel satisfied</td>
<td>0.572</td>
<td>0.649</td>
<td>Factor 2- 1.127</td>
</tr>
<tr>
<td>2. Be healthier</td>
<td>0.605</td>
<td>-0.169</td>
<td></td>
</tr>
<tr>
<td>3. Feel protected</td>
<td>0.652</td>
<td>-0.065</td>
<td></td>
</tr>
<tr>
<td>4. Enjoy the sexual experience</td>
<td>0.661</td>
<td>0.628</td>
<td></td>
</tr>
<tr>
<td>5. Worry less about catching disease</td>
<td>0.782</td>
<td>-0.523</td>
<td></td>
</tr>
<tr>
<td>6. Be more confident about my sexual experience</td>
<td>0.759</td>
<td>-0.067</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.6

Summary of confirmatory factor analysis on subscale measuring outcome expectations giving a one factor solution (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor1(loadings)</th>
<th>Eigenvalues(Variance explained by the factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRINCIPAL COMPONENTS METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I use condoms at sexual intercourse at all times I will</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Be healthier</td>
<td>0.795</td>
<td></td>
</tr>
<tr>
<td>2. Feel protected</td>
<td>0.755</td>
<td>2.575</td>
</tr>
<tr>
<td>3. Worry less about catching any disease</td>
<td>0.860</td>
<td></td>
</tr>
<tr>
<td>4. Be more confident about my sexual experiences</td>
<td>0.796</td>
<td></td>
</tr>
<tr>
<td><strong>MAXIMUM LIKELIHOOD METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I use condoms at sexual intercourse at all times I will</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Be healthier</td>
<td>0.680</td>
<td></td>
</tr>
<tr>
<td>2. Feel protected</td>
<td>0.642</td>
<td>2.121</td>
</tr>
<tr>
<td>3. Worry less about catching disease</td>
<td>0.846</td>
<td></td>
</tr>
<tr>
<td>4. Be more confident about my sexual experience</td>
<td>0.729</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.7.  Summary of confirmatory factor analysis on subscale measuring outcome expectancies giving a two factor solution (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (loadings)</th>
<th>Factor 2 (loadings)</th>
<th>Eigenvalues (Variance explained by factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRINCIPAL COMPONENTS METHOD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How important are using condoms all the time to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Feel satisfied</td>
<td>0.719</td>
<td>0.474</td>
<td>Factor 1-3.290</td>
</tr>
<tr>
<td>2. Be healthier</td>
<td>0.783</td>
<td>0.425</td>
<td>Factor 2-1.359</td>
</tr>
<tr>
<td>3. Feel protected</td>
<td>0.760</td>
<td>-0.460</td>
<td></td>
</tr>
<tr>
<td>4. Enjoy the sexual experience</td>
<td>0.718</td>
<td>0.545</td>
<td></td>
</tr>
<tr>
<td>5. Worry less about catching disease</td>
<td>0.747</td>
<td>-0.494</td>
<td></td>
</tr>
<tr>
<td>6. Be more confident about my sexual experiences</td>
<td>0.713</td>
<td>0.448</td>
<td></td>
</tr>
<tr>
<td><strong>MAXIMUM LIKELIHOOD METHOD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Feel satisfied</td>
<td>0.675</td>
<td>-0.360</td>
<td>Factor 1-2.958</td>
</tr>
<tr>
<td>2. Be healthier</td>
<td>0.743</td>
<td>0.386</td>
<td>Factor 2-1.045</td>
</tr>
<tr>
<td>3. Feel protected</td>
<td>0.705</td>
<td>0.428</td>
<td></td>
</tr>
<tr>
<td>4. Enjoy the sexual experience</td>
<td>0.732</td>
<td>-0.518</td>
<td></td>
</tr>
<tr>
<td>5. Worry less about catching disease</td>
<td>0.699</td>
<td>0.460</td>
<td></td>
</tr>
<tr>
<td>6. Be more confident about my sexual experience</td>
<td>0.656</td>
<td>-0.322</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.8

Summary of confirmatory factor analysis on subscale measuring outcome expectancies giving a one factor solution (n=150)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor1(loadings)</th>
<th>Eigenvalues(Variance explained by the factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRINCIPAL COMPONENTS METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How important are using condoms at all times to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Be healthier</td>
<td>0.877</td>
<td>2.593</td>
</tr>
<tr>
<td>2. Feel protected</td>
<td>0.878</td>
<td></td>
</tr>
<tr>
<td>3. Worry less about catching any disease</td>
<td>0.867</td>
<td></td>
</tr>
<tr>
<td>4. Be more confident about my sexual experiences</td>
<td>0.549</td>
<td></td>
</tr>
<tr>
<td><strong>MAXIMUM LIKELIHOOD METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How important are using condoms at all times to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Be healthier</td>
<td>0.839</td>
<td>2.236</td>
</tr>
<tr>
<td>2. Feel protected</td>
<td>0.828</td>
<td></td>
</tr>
<tr>
<td>3. Worry less about catching disease</td>
<td>0.828</td>
<td></td>
</tr>
<tr>
<td>4. Be more confident about my sexual experience</td>
<td>0.401</td>
<td></td>
</tr>
</tbody>
</table>
Both principal component method and maximum likelihood method confirmed the presence of one factor. Both the criteria of eigenvalue greater than 1.0 and factor loadings greater than 0.40 were satisfied under both methods as shown in Table 3.8.

The results from the confirmatory factor analysis on the self-efficacy for safer sex behaviors are presented in Table 3.9. On principal components analysis, eigenvalue was greater than 1.0 and all factor loadings were greater than 0.40. On maximum likelihood method, eigenvalue was greater than 1.0 and factor loadings were greater than 0.40 for all items except one (I am confident of being monogamous) which shows lower factor loadings when using maximum likelihood method but the factor loadings are close to 4.0 when using principal components method for factor analysis.

The results from the confirmatory factor analysis on the self-efficacy in overcoming barriers for safer sex are presented in Table 3.10. Both principal components and maximum likelihood methods confirmed the presence of one factor. Both the criteria of eigenvalue greater than 1.0 and factor loadings greater than 0.4 were satisfied under both methods.

The internal consistency of the subscales was established by calculating Cronbach alphas for this dataset. The Cronbach alphas were 0.729 for self-control for safer sex, 0.807 for outcome expectations for safer sex, 0.757 for outcome expectancies for safer sex, 0.758 for situational perceptions for safer sex, 0.644 for self-efficacy for safer sex, 0.902 for self-efficacy in overcoming barriers for safer sex and 0.760 for safer sex behaviors. All the coefficients were found to be more than 0.70 (except for self-efficacy for safer sex), the *apriori* level which is accepted by most authors (Carmine, & Zeller, 1979).

The results of the internal consistency on the subscales are presented in Table 3.11. The test-retest reliability coefficients were found to be 0.851 for self-control for safer sex, 0.789 for
expectations for safer sex, 0.872 for situational perceptions for safer sex, 0.715 for self-efficacy for safer sex, 0.806 for self-efficacy in overcoming barriers for safer sex and 0.761 for safer sex behaviors. All the coefficients were found to be greater than 0.70 (Carmines, & Zeller, 1979).

The results of the test-retest reliability are presented in Table 3.12

**Study design and its rationale**

The predictors for safer sex behaviors were constructs of social cognitive theory- namely (1) situational perceptions for safer sex, (2) expectations for safer sex, (3) expectancies for safer sex (operationalized together with expectations) (4) self-efficacy for safer sex (5) self-efficacy in overcoming barriers for safer sex and (5) self-control for safer sex. The design used for testing the theory-based intervention among target population of African American college students was a one between and one within repeated measures design. The between variable was the grouping variable (experimental group and control group) while the within variable was where the subjects were measured repeatedly (like time) (Stevens, 2002).

In this case a pretest, a post-test after a week and a follow-up after six weeks of the participants were conducted. One arm of college students was offered a theory-based intervention program (experimental group) and the non-theory based arm (knowledge-based) of college students were given a knowledge-based intervention program focusing on HIV/AIDS and sexually transmitted diseases.
Table 3.9

*Summary of Confirmatory Factor Analysis on self-efficacy for safer sex among African-American college students (n=150)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (loadings)</th>
<th>Eigenvalues (Variance explained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident…</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. That I can make sure a condom is used each time I engage in sexual intercourse</td>
<td>0.808</td>
<td>2.102</td>
</tr>
<tr>
<td>2. That I can open the pack without tear or damage each time I engage in sexual intercourse.</td>
<td>0.632</td>
<td></td>
</tr>
<tr>
<td>3. Of insisting my partner to use condoms at all times I engage in sexual intercourse</td>
<td>0.699</td>
<td></td>
</tr>
<tr>
<td>4. Of keeping space at the end of the condom during use.</td>
<td>0.639</td>
<td></td>
</tr>
<tr>
<td>5. Of being monogamous(having only one partner in a relationship)</td>
<td>0.390</td>
<td></td>
</tr>
</tbody>
</table>

**PRINCIPAL COMPONENTS METHOD**

**MAXIMUM LIKELIHOOD METHOD**

1. That I can make sure a condom is used each time I engage in sexual intercourse  
   0.902
2. That I can open the pack without tear or damage each time I engage in sexual intercourse.  
   0.440
3. Of insisting my partner to use condoms at all times I engage in sexual intercourse  
   0.622
4. Of keeping space at the end of the condom during use.  
   0.341
5. Of being monogamous(having only one partner in a relationship)  
   0.196
Table 3.10

*Summary of Confirmatory Factor Analysis on self-efficacy in overcoming barriers for safer sex among African-American college students (n=150)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor1 (loadings)</th>
<th>Eigen values (Variance explained by factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRINCIPAL COMPONENTS METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How confident are you of using condoms during sexual intercourse …</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. When you are in a hurry</td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>2. When your partner is uncomfortable using it</td>
<td>0.874</td>
<td>3.098</td>
</tr>
<tr>
<td>3. When you are under the influence of alcohol</td>
<td>0.875</td>
<td></td>
</tr>
<tr>
<td>4. When you feel it reduces sexual pleasure</td>
<td>0.859</td>
<td></td>
</tr>
<tr>
<td><strong>MAXIMUM LIKELIHOOD METHOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. When you are in a hurry</td>
<td>0.903</td>
<td>2.803</td>
</tr>
<tr>
<td>2. When your partner is uncomfortable using it</td>
<td>0.833</td>
<td></td>
</tr>
<tr>
<td>3. When you are under the influence of alcohol</td>
<td>0.818</td>
<td></td>
</tr>
<tr>
<td>4. When you feel it reduces sexual pleasure</td>
<td>0.791</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.11

*Internal consistency of the subscales for reliability statistics for safer sex among African-American college students (n=150)*

<table>
<thead>
<tr>
<th>Scales</th>
<th>No of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Self-control for safer sex</td>
<td>4</td>
<td>0.729</td>
</tr>
<tr>
<td>2) Outcome Expectations for safer sex</td>
<td>4</td>
<td>0.807</td>
</tr>
<tr>
<td>3) Outcome Expectancies for safer sex</td>
<td>4</td>
<td>0.757</td>
</tr>
<tr>
<td>4) Situational Perception for safer sex</td>
<td>4</td>
<td>0.758</td>
</tr>
<tr>
<td>5) Self-Efficacy for safer sex</td>
<td>5</td>
<td>0.644</td>
</tr>
<tr>
<td>6) Self-Efficacy in overcoming barriers for safer sex</td>
<td>4</td>
<td>0.902</td>
</tr>
<tr>
<td>7) Safer sex behaviors</td>
<td>5</td>
<td>0.760</td>
</tr>
</tbody>
</table>
Table 3.12  
*Test-Retest reliability of subscales for safer sex among African-American college students*  

*(n=150)*

<table>
<thead>
<tr>
<th>Scales</th>
<th>No. of items</th>
<th>Pearson Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-control for safer sex</td>
<td>4</td>
<td>0.851**</td>
</tr>
<tr>
<td>2. Expectations for safer sex</td>
<td>4</td>
<td>0.789**</td>
</tr>
<tr>
<td>3. Situational perceptions for safer sex</td>
<td>4</td>
<td>0.872**</td>
</tr>
<tr>
<td>4. Self-efficacy for safer sex</td>
<td>5</td>
<td>0.715**</td>
</tr>
<tr>
<td>5. Self-efficacy towards barriers for safer sex</td>
<td>4</td>
<td>0.806**</td>
</tr>
<tr>
<td>6. Safer sex behaviors</td>
<td>5</td>
<td>0.761**</td>
</tr>
</tbody>
</table>

** Correlation significant at 0.01 level (2-tailed)
This was a longitudinal study where participants were measured at pretest, measured at posttest after a week and later at the end of six weeks. As the purpose of this study was to look at the residual effect of intervention over time, a repeated measures design was better than other alternatives such as the design of one-way analysis of variance on post-test scores (Stevens, 2002).

Sample size and recruitment

The African American Cultural Center and Ethnic Programs & Services, a university based student organization for African American college students was approached to recruit students into the study. A recruitment letter was provided to the Cultural Center and a letter of permission obtained from the center head. The students were recruited in the following ways: a) The African-American Cultural Center were asked to e-mail African-American students, who are members of this organization informing them about a health promotion workshop activity at the center b) Flyers mentioning details about the health promotion workshops (such as dates, times and locations when the workshops would be conducted, highlighting the incentives offered and researcher contact details) were put at various places on the campus, such as library display boards, student activity center, student recreation center, residence halls and other campus buildings. c) Announcements regarding the Health Promotion workshops were made (with the permission of the professors) in various classes in the Health Promotion and Education program and African-American studies program d) Announcements were made regarding the details of Health Promotion activity workshops at meetings conducted at the African-American Cultural Center and Student Ethnic Services.

A convenience sample of 141 African-American college students from all majors, undergraduate and graduate students were randomized into two arms of the intervention such
that there were approximately equal groups of 70 students in both the intervention (theory-based) and non-theory (knowledge-based) group. There were 73 students in the experimental (theory-based) intervention group and 68 students in the knowledge-based (non-theory) group. This sample size of college students was calculated considering an alpha value of 0.05, with a power of 0.80 and an estimated effect of 0.50 (Durlak, 1995). A sample size of 63 for each arm of intervention was ascertained. This sample size was estimated attrition with 10% attrition rate. Attrition rate was limited to 10% as far as possible by sending reminder e-mails and making repeated telephone calls. Incentives were offered at pretest, post-test at 1 week and follow-up at 6-weeks.

**Randomization and Intervention**

The intervention for each arm of the target population of African American college students was workshop-based. There were 28 workshops in total. 14 workshops of approximately 5 students each were offered for the intervention (theory-based) group and 14 workshops of approximately 5 students each were offered for the non-theory (knowledge-based) group. Each workshop was 2 hours long and consisted of 4 half-hour sessions. The sessions for the intervention (theory-based) arm (SEE APPENDIX -C) were based on the constructs of situational perception for safer sex, self-efficacy towards safer sex, self-efficacy towards overcoming barriers for safer sex, expectations about safer sex and self-control for safer sex. Methods such as informational talk, brainstorming, demonstration and group discussion were used. The sessions for the non-theory (knowledge-based) arm were based on knowledge about HIV/AIDS and sexually transmitted diseases. All the sessions were implemented by the researcher at the African-American Cultural and Research Center on the University of Cincinnati campus.
**Intervention: Experimental (theory-based) and Non-theory (knowledge-based)**

One workshop consisting of four sessions was developed for the experimental (theory-based) group and one workshop consisting of four sessions was developed for the non-theory (knowledge-based) group. Detailed descriptions of these interventions can be found in Appendix C. The behavioral objectives for the experimental (theory-based) intervention was to enable at least 80% percent of the participating African-American college students to:

(a) develop **situational perceptions about safer sex** that were defined as insights pertaining to condom use and having monogamous relationships by African American college students.

(b) develop **outcome expectations and outcome expectancies about safer sex** that were defined as anticipated outcome benefits of safe sex behavior (condom usage at all times of engaging in sexual intercourse and monogamy (having only one partner from time of initiation of sexual intercourse) in target population of African American college students. The anticipated outcome benefits of feeling satisfied, feeling healthy, feeling protected, enjoying sexual experiences, worrying less about catching a disease, and be more confident about their sexual life in a target population of African American college students and defined as the personal value placed on the anticipatory outcome benefits of feeling satisfied, feeling healthy, feeling protected, enjoying sexual experiences, worrying less about catching a disease, and be more confident about their sexual life in a target population of African American college students.

(c) develop **self-efficacy towards safer sex** that was defined as the confidence that an African American (freshman, sophomore, junior, senior, & graduate) will have in his or her ability to initiate condom use while participating in sexual
intercourse, be consistent in its usage on every occasion and being correct in its usage at all times.

(d) develop **self-efficacy in overcoming barriers towards safer sex** that was defined as the confidence that an African American college student will have in his or her ability to initiate condom use when while participating in sexual intercourse, be consistent in its usage on every occasion and being correct in its usage at all times when faced with barriers.

(e) develop **self-control towards safer sex** that was defined as the ability of an African American college student to self-reward upon adequate accomplishment of safe sexual behavior (condom use every time engaging in sexual intercourse and having one partner from first time initiation of sexual intercourse) and utilize self-set goals.

(f) develop **safer sex behaviors** that were defined as correct and consistent condom usage while engaging in sexual intercourse and having one sexual partner ever (monogamy).

The knowledge objectives of the non-theory (knowledge-based) interventions were to enable at least 80 percent of the participating African-American college students to

(a) develop knowledge about HIV virus structure and natural history of HIV/AIDS.

(b) Improve their understanding of the clinical features of HIV/AIDS and sexually transmitted diseases.

(c) Understand the epidemiological relationships between HIV/AIDS and sexually transmitted diseases
(d) develop knowledge about Condom usage and some disadvantages and problems with its usage.

(e) develop knowledge about behavioral interventions for HIV/AIDS and sexually transmitted disease risk reduction.

Learning objectives: [Experimental (Theory-based group)]

(1) After the completion of the four sessions (HIV/AIDS and Safer Sex Behaviors) the participating African-American college students will be able to identify what HIV (Human Immunodeficiency Virus) infection means. (SEE APPENDIX- C & APPENDIX- D)

(2) After the completion of the four sessions (HIV/AIDS and Safer Sex Behaviors) the participating African-American college students will be able to define sexually transmitted diseases (SEE APPENDIX- C & APPENDIX -D)

(3) After the completion of the four sessions (HIV/AIDS and Safer Sex Behaviors) the participating African-American college students will be able to identify two ways of spread of sexually transmitted diseases (SEE APPENDIX- C & APPENDIX -D)

(4) After the completion of the four sessions (condom use information and skill building by practice), the participating African-American college students will be able to demonstrate appropriate usage of condoms (opening the packet, rolling it, putting space at end) (SEE APPENDIX -C & APPENDIX -E)

(5) After the completion of the four sessions (condom use information and skill building by practice), the participating African-American college students will be able to demonstrate male condom use with a penile model (SEE APPENDIX- C)

(6) After the completion of the four sessions (discussion on personal barriers to condom usage and communication skills building), the participating African-American college
students will be able to identify at least three difficulties associated with condom usage during sexual intercourse and develop personalized strategies to solve these (SEE APPENDIX- C)

(7) After the completion of the four sessions (discussion on personal barriers to condom usage and communication skills building), the participating African-American college students will be able to demonstrate effective partner-communication skills (SEE APPENDIX -C & APPENDIX -F).

(8) After the completion of the four sessions (discussion on personal barriers to condom usage and communication skills building), the participating African-American college students will be able to demonstrate condom negotiation skills (SEE APPENDIX -C)

(9) After the completion of the four sessions (rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior), the participating African-American college students will be able to identify at least two misconceptions about safer sex behaviors (SEE APPENDIX- C)

(10) After the completion of the four sessions (rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior), the participating African-American college students will be able to identify at least two beneficial outcomes of safer sex behaviors (SEE APPENDIX- C)

(11) After the completion of the four sessions (rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior), the participating African-American college students will be able to describe the relevance of the outcomes in their lives (SEE APPENDIX- C)
(12) After the completion of the four sessions (rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior), the participating African-American college students will be able to identify at least two ways of setting personal goals for indulging in safer sex behavior. (SEE APPENDIX- C)

Learning objectives: [non-theory (knowledge-based)]

(1) After the completion of the four sessions (introduction to HIV/AIDS and knowledge about the virus), the participating African – American college students will be able to identify the structure, origins, and replication process of HIV virus (SEE APPENDIX- C & APPENDIX- G)

(2) After the completion of the four sessions (introduction to HIV/AIDS and knowledge about the virus), the participating African – American college students will be able to describe the natural history of HIV/AIDS (SEE APPENDIX- C & APPENDIX- G)

(3) After the completion of the four sessions (introduction to HIV/AIDS and knowledge about the virus), the participating African-American college students will be able to list at least ten myths related to HIV/AIDS. (SEE APPENDIX- C & APPENDIX- G)

(4) After the completion of the four sessions (HIV/AIDS and sexually transmitted diseases), the participating African-American college students will be able to list at least three symptoms of HIV/AIDS (SEE APPENDIX- C & APPENDIX- G)

(5) After the completion of the four sessions (HIV/AIDS and sexually transmitted diseases), the participating African-American college students will be able to list at least two symptoms of various sexually transmitted diseases. (SEE APPENDIX- C & APPENDIX-G)
(6) After the completion of the four sessions (HIV/AIDS and sexually transmitted
diseases), the participating African-American college students will be able to list atleast
two sexually transmitted diseases. (SEE APPENDIX- C & APPENDIX- G)

(7) After the completion of the four sessions (Epidemiological relationship and condom
usage), the participating African-American college students will be able to describe the
biological relationship between HIV/AIDS and sexually transmitted diseases (SEE
APPENDIX- C & APPENDIX- G)

(8) After the completion of the four sessions (Epidemiological relationship and condom
usage), the participating African-American college students will be able to discuss at least
two models of risk reduction. (SEE APPENDIX -C & APPENDIX -G)

(9) After the completion of the four sessions (Epidemiological relationship and condom
usage), the participating African-American college students will be able to identify at least
three common problems with condom usage (SEE APPENDIX -C & APPENDIX -G).

(10) After the completion of the four sessions (Epidemiological relationship and condom
usage), the participating African-American college students will be able to identify at least
three disadvantages of condom usage (SEE APPENDIX -C & APPENDIX- G).

(11) After the completion of the four sessions (Behavioral interventions for risk reduction),
the participating African-American college students will be able to identify at least two
different types of behavioral interventions (SEE APPENDIX -C and APPENDIX-G)

(12) After the completion of the four sessions (Behavioral interventions for risk reduction),
the participating African-American college students will be able to identify the concept of
‘core group’ in risk reduction (SEE APPENDIX- C and APPENDIX-G).
(13) After the completion of the four sessions (Behavioral interventions for risk reduction), the participating African-American college students will be able to identify the concept of ‘sexual networks’ in risk reduction (SEE APPENDIX- C and APPENDIX-G).

(14) After the completion of the four sessions (Behavioral interventions for risk reduction), the participating African-American college students will be able to define ‘structural interventions’ in risk reduction (SEE APPENDIX- C and APPENDIX-G).

To assess the consistency and discrepancy between the planned program and the program actually occurring for each of the eight sessions [4 theory-based and 4 non-theory (knowledge-based) tally sheets were prepared. Face and content validity of these sheets were established by simultaneously comparing the sessions with the tally sheets by four experts and the researcher (three university professors and one public health educators) in a two-round review process (SEE APPENDIX-H, APPENDIX- I and APPENDIX- J)

Data collection

Implementation of this study and data collection was done during the period May- July 2009. A pretest survey questionnaire was given to all workshop participants at the beginning of each workshop. A food incentive (pizza and drink) was provided to all the participants taking part in the workshop. A record was kept of the contact details: name, e-mail address and telephone number of all the participants on a log sheet. Also recorded on this sheet was whether these participants have completed the post-test follow up survey questionnaire at the end of one week and at the end of six weeks.

The participants were asked to complete a post-test online survey questionnaire at one week duration and at six week duration after workshop completion. An incentive of $4 cash was provided, which had to be collected from the African-American Center. Similarly a $4 cash
incentive was provided to the participants for completion of the survey at six week duration. This again had to be collected from the African- American center. Process evaluation was done to ascertain that each session adhered to planned method. Student participants who failed to complete more than 80% of the scale (34 items), were eliminated from the study.

Data analyses

Data was analysed using Statistical Package for Social Sciences (SPSS) version 16 for descriptive statistics, such as frequencies, mean, median, and range of responses for the participants studied. Repeated measures analysis of variance was carried out using the Statistical Analysis Software (SAS) version 9.1. A univariate approach for repeated measures analysis was used. The assumptions for the single-group univariate repeated measures analysis such as (a) multivariate normality and (b) homogeneity of variance were tested on residuals of study subscales. The pretest and post test group differences among both arms of students were measured.
Chapter 4

Results

The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college students. The current study used five constructs of social cognitive theory: expectations for safer sex (outcome expectations x outcome expectancies), situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self-control for safer sex. The knowledge construct of social cognitive theory was not used as it was believed that college students had a good knowledge about HIV/AIDS and sexually transmitted diseases along with use of safer sex behaviors to prevent getting a disease. The environment construct was also not used in this study as it is difficult to modify the physical and social circumstances of individuals. A parsimonious model was used in this study which included five constructs from social cognitive theory. This is a greater numbers of constructs than were used in any of the previous studies examining safer sex (Strader & Beaman, 1991; Wulfert, & Wan, 1995). Along with the Information-Behavioral-Skills model, Social Cognitive Theory had been used extensively for reducing HIV risk behaviors and sexually transmitted diseases in heterosexual African-Americans (Darbes, et al., 2008; Semann et al., 2002). Furthermore brief interventions in African-American adolescents, especially in school-based and community settings have been effective in promoting safer sex behaviors (Ickes, & Sharma, 2007). Hence, the current study tests a social cognitive theory based brief intervention for safer sex behavioral change among a target population of African-American college students.

This chapter begins with the results of pretest data in which a comparison between experimental and comparison groups on demographic variables is reported. This is followed by
the results of the pretest, 1 week post-test and 6 week post-test data for study variables and construct subscales. The degree of fidelity of program implementation is then reported. The results for the changes (from before to after intervention) in the SCT constructs and safer sex skills along with significant demographic covariates are reported next. Finally, tests of statistical assumptions made for the repeated measures analysis of variance on the study variables and the residuals from the statistical models are reported.

Results from pretest data on demographic variables

A total of 141 African-American college students at a large mid-western University were recruited for this study. These students were randomly assigned to an experimental (theory-based) intervention group [n=73] or a knowledge-based (non-theory) intervention group [n=68]. A comparison of demographic characteristics of the experimental (theory-based) and the knowledge-based (non-theory) is depicted in Tables 4.1, 4.2, and 4.3. From Table 4.1 it is evident that the students in the experimental (theory-based) and the knowledge-based (non-theory) groups did not differ in terms of any of the demographic variables, namely age, gender, or diagnosis with a sexually transmitted disease. Approximately half of the students were undergraduates (n=72, 51.1%), and female (n=75, 53.2%) while a large majority had never been diagnosed with a sexually transmitted disease (n=130, 92.2%). From Table 4.2 it is evident that the students in the experimental (theory-based) and the knowledge-based (non-theory) groups did not differ on any of the demographic variables, namely year in school, grade point average and whether a sexuality class was ever taken.
Table 4.1

Descriptive statistics on age, gender and diagnosis of sexually transmitted disease variables: Experimental (Theory-based [n=73]) and non-theory (knowledge-based) [n=68]) intervention groups of African-American college students.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (theory-based)</th>
<th>Non-theory (knowledge-based)</th>
<th>Total</th>
<th>Chi square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>M(SD)</td>
<td>%</td>
<td>F-statistic</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>35</td>
<td>22.0(5.4)</td>
<td>48.6</td>
<td>2.33</td>
</tr>
<tr>
<td>21-25</td>
<td>29</td>
<td>53.7</td>
<td>37</td>
<td>46.3</td>
</tr>
<tr>
<td>&gt;25</td>
<td>9</td>
<td>60</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>57.6</td>
<td>28</td>
<td>42.4</td>
</tr>
<tr>
<td>Female</td>
<td>35</td>
<td>46.7</td>
<td>40</td>
<td>53.3</td>
</tr>
<tr>
<td>STD diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5</td>
<td>45.5</td>
<td>6</td>
<td>54.5</td>
</tr>
<tr>
<td>No</td>
<td>68</td>
<td>52.3</td>
<td>62</td>
<td>47.7</td>
</tr>
</tbody>
</table>
Table 4.2

Descriptive statistics on year at school, grade point average and sexuality class taken ever variables: Experimental (theory-based \[n=73\]) and non-theory (knowledge-based \[n=68\]) intervention groups of African-American college students

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (theory-based)</th>
<th>Non-theory (knowledge-based)</th>
<th>Total</th>
<th>Total</th>
<th>Pearson Chi-Square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>M(SD)</td>
<td>%</td>
<td>F-statistic</td>
<td>range</td>
<td>f</td>
</tr>
<tr>
<td>Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>13</td>
<td>46.4</td>
<td>46.4</td>
<td>2.265</td>
<td>1.5</td>
<td>15</td>
</tr>
<tr>
<td>Sophomore</td>
<td>15</td>
<td>44.1</td>
<td>44.1</td>
<td>40.29</td>
<td>2.5</td>
<td>19</td>
</tr>
<tr>
<td>Junior</td>
<td>16</td>
<td>53.3</td>
<td>53.3</td>
<td>0.687</td>
<td>3.0</td>
<td>14</td>
</tr>
<tr>
<td>Senior</td>
<td>21</td>
<td>58.3</td>
<td>58.3</td>
<td>0.571</td>
<td>3.5</td>
<td>15</td>
</tr>
<tr>
<td>Graduate</td>
<td>8</td>
<td>61.5</td>
<td>61.5</td>
<td>0.747</td>
<td>4.0</td>
<td>5</td>
</tr>
<tr>
<td>Grade point avg.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 1.5 and &lt;2.5</td>
<td>9</td>
<td>50</td>
<td>50</td>
<td>40.29</td>
<td>1.5</td>
<td>9</td>
</tr>
<tr>
<td>≥ 2.5 and &lt;3.0</td>
<td>22</td>
<td>48.9</td>
<td>48.9</td>
<td>22</td>
<td>2.5</td>
<td>23</td>
</tr>
<tr>
<td>≥ 3.0 and &lt;3.5</td>
<td>34</td>
<td>52.3</td>
<td>52.3</td>
<td>47.7</td>
<td>3.0</td>
<td>31</td>
</tr>
<tr>
<td>≥ 3.5 and ≤4.0</td>
<td>8</td>
<td>61.5</td>
<td>61.5</td>
<td>38.5</td>
<td>3.5</td>
<td>5</td>
</tr>
<tr>
<td>Sexuality class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>50</td>
<td>50</td>
<td>36.9</td>
<td>3.5</td>
<td>26</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>52.8</td>
<td>52.8</td>
<td>47.2</td>
<td>4.0</td>
<td>42</td>
</tr>
</tbody>
</table>
Approximately the same number of students were in the freshman (n=28, 19.9%), sophomore (n=34, 24.1%), junior (n=30, 21.3%) and senior years (n=36, 25.5%). A majority of the students had a grade point average between 3 and 3.5 and had not ever taken a sexuality class (n=89, 63.1%) Similarly from Table 4.3, it is evident that the students in the experimental (theory-based) and the knowledge-based (non-theory) groups did not differ in terms of any of the demographic variables, namely number of sexual partners in the past year, age at first sexual intercourse, and whether they were presently taking a sexuality class. The majority of students had a maximum of two partners in the past year (n=92, 65.2%), had initiation of sexual intercourse between 16-18 years of age (n=83, 58.9%) and were not taking a sexuality class at present (n=139, 98.6%).

The mean scores with standard deviations on various construct subscales as well as safer sex behavioral skills for the experimental (theory-based) and the knowledge-based (non-theory) intervention groups are reported in Table 4.4. An examination of Table 4.4 indicates that there was no difference between the two groups for situational perceptions for safer sex, expectations for safer sex, self-efficacy towards safer sex, self-efficacy in overcoming barriers for safer sex, self-control for safer sex and for safer sex behaviors.

The possible and observed ranges of scores for various construct subscales as well as safer sex behavioral skills for experimental (theory-based) and knowledge-based (non-theory) intervention groups at pretest, 1-week post-test and 6-weeks post test are reported in Table 4.5. An examination of Table 4.4 and Table 4.5 indicate that the mean scores for the various SCT construct subscales are above the mid-range of the possible range at baseline or pretest for the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (except
Table 4.3

**Descriptive statistics on sexual partners, age at first sexual intercourse and sexuality class at present variables: Experimental (theory-based \[n=73\]) and non-theory (knowledge-based \[n=68\]) intervention groups of African-American college students**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (theory-based)</th>
<th>Non-theory (knowledge-based)</th>
<th>Total freq</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>M(SD)</td>
<td>%</td>
<td>F-statistic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual partners (py)</td>
<td></td>
<td>2.23(1.64)</td>
<td>0.08</td>
<td>0-9</td>
</tr>
<tr>
<td>0-2</td>
<td>51</td>
<td>55.4</td>
<td>41</td>
<td>44.6</td>
</tr>
<tr>
<td>3-5</td>
<td>19</td>
<td>42.2</td>
<td>26</td>
<td>57.8</td>
</tr>
<tr>
<td>6-8</td>
<td>2</td>
<td>66.7</td>
<td>1</td>
<td>33.3</td>
</tr>
<tr>
<td>&gt;8</td>
<td>1</td>
<td>100.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Age at first sex Int.</td>
<td></td>
<td>16.53(2.16)</td>
<td>0.52</td>
<td>10-28</td>
</tr>
<tr>
<td>10-12</td>
<td>1</td>
<td>33.3</td>
<td>2</td>
<td>66.7</td>
</tr>
<tr>
<td>13-15</td>
<td>20</td>
<td>48.8</td>
<td>21</td>
<td>51.2</td>
</tr>
<tr>
<td>16-18</td>
<td>44</td>
<td>53.0</td>
<td>39</td>
<td>47.0</td>
</tr>
<tr>
<td>19-21</td>
<td>7</td>
<td>58.3</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>&gt;21</td>
<td>1</td>
<td>50.0</td>
<td>1</td>
<td>50.0</td>
</tr>
<tr>
<td>Sexuality class(present)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>100.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>51.0</td>
<td>68</td>
<td>49.0</td>
</tr>
</tbody>
</table>

(Py= past year  sex.int= sexual intercourse)
Table 4.4

Comparison of means and standard deviations of subscale scores in experimental (theory-based) and knowledge-based (non-theory) based at pretest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (Theory-based) group Mean (SD)</th>
<th>Knowledge-based (non-theory) group Mean(SD)</th>
<th>F-statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Situational perceptions for safer sex</td>
<td>12.47 (4.40)</td>
<td>11.88 (4.22)</td>
<td>0.027</td>
<td>0.869</td>
</tr>
<tr>
<td>2. Expectations for safer sex</td>
<td>78.28 (20.85)</td>
<td>76.26 (24.49)</td>
<td>2.837</td>
<td>0.094</td>
</tr>
<tr>
<td>3. Self-efficacy for safer sex</td>
<td>15.78 (5.92)</td>
<td>15.63 (6.28)</td>
<td>0.752</td>
<td>0.387</td>
</tr>
<tr>
<td>4. Self-efficacy in overcoming barriers for</td>
<td>10.00 (5.40)</td>
<td>10.11 (5.46)</td>
<td>0.363</td>
<td>0.548</td>
</tr>
<tr>
<td>5. Self-control for safer sex</td>
<td>14.69 (3.26)</td>
<td>13.79 (4.20)</td>
<td>1.728</td>
<td>0.191</td>
</tr>
<tr>
<td>6. Safer sex behaviors</td>
<td>16.45 (4.90)</td>
<td>16.54 (4.86)</td>
<td>0.007</td>
<td>0.932</td>
</tr>
</tbody>
</table>

SD= Standard Deviation
Table 4.5

Table of possible and observed range of scores on study scales at baseline (pretest), 1-week post-test and at 6-weeks post-test by Experimental (theory-based [n=73]) and non-theory (knowledge-based [(n=68)]) intervention groups.

<table>
<thead>
<tr>
<th>Variables(Scales)</th>
<th>Group</th>
<th>Baseline(pretest)</th>
<th></th>
<th>1-week post-test</th>
<th></th>
<th>6-weeks posttest</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Possible</td>
<td>Observed</td>
<td>Possible</td>
<td>Observed</td>
<td>Possible</td>
<td>Observed</td>
</tr>
<tr>
<td>1) Situational Perception for safer</td>
<td>Experimental</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
</tr>
<tr>
<td>sex</td>
<td>Knowledge-based</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-100</td>
<td>4-100</td>
</tr>
<tr>
<td>2) Expectations for safer sex</td>
<td>Experimental</td>
<td>4-100</td>
<td>4-100</td>
<td>4-100</td>
<td>15-100</td>
<td>4-100</td>
<td>24-100</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>4-100</td>
<td>7-100</td>
<td>4-100</td>
<td>22-100</td>
<td>4-100</td>
<td>24-100</td>
</tr>
<tr>
<td>3) Self-Efficacy for safer sex</td>
<td>Experimental</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
</tr>
<tr>
<td>4) Self-efficacy in overcoming barriers for safer sex</td>
<td>Experimental</td>
<td>4-20</td>
<td>3-15</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>4-20</td>
<td>3-15</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
</tr>
<tr>
<td>5) Self-control for safer sex</td>
<td>Experimental</td>
<td>4-20</td>
<td>6-20</td>
<td>4-20</td>
<td>7-20</td>
<td>4-20</td>
<td>8-20</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
<td>4-20</td>
</tr>
<tr>
<td>6) Safer sex behaviors</td>
<td>Experimental</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
<td>5-25</td>
</tr>
</tbody>
</table>
for the construct of self-efficacy towards barriers for safer sex, which is below the mid-range of the possible range).

Results from the pretest and post-test data comparisons

Comparison of the ranges of scores for the various subscales of the SCT constructs at baseline (pretest), 1-week post test and 6-weeks post-test as shown in Table 4.5 indicate that for the construct of situational perceptions for safer sex, the possible and observed ranges are the same at baseline (pretest), 1-week post-test and 6 weeks post-test for the experimental (theory-based) intervention group and the possible and observed ranges are different for the knowledge based (non-theory) intervention group. For the construct of expectations for safer sex, the possible and observed ranges are the same at baseline (pretest) for the experimental (theory-based) intervention group. For the construct of self-efficacy for safer sex, the possible and observed ranges are the same at baseline (pretest), 1-week post-test and 6-weeks post test for the experimental (theory-based) and the knowledge based (non-theory) intervention groups. For the construct of self-efficacy towards barriers for safer sex, the possible and observed ranges are same for the 1-week post-test and the 6-weeks post-test for the experimental (theory-based) and the knowledge based (non-theory) intervention groups. For the construct of self-control towards safer sex, the possible and observed ranges are the same for baseline (pretest), 1-week post-test and 6-weeks post-test for the knowledge-based (non-theory) intervention group. For the safer sex behavior skills, the possible and observed ranges are the same for baseline (pretest), 1-week post-test and 6-weeks post-test for the experimental (theory-based) and the knowledge-based (non-theory) intervention groups.

A comparison of the descriptive statistics for the constructs of social cognitive theory, namely situational perception for safer sex, expectations for safer sex, self-efficacy for safer sex self-
efficacy towards barriers for safer sex and self-control for safer sex along with safer sex behavioral skills is reported in Table 4.6.

It can be seen in Table 4.6 that a marked improvement in mean scores over time occurred for expectations for safer sex in the experimental (theory-based) intervention group as well as the knowledge-based (non-theory) intervention group. The mean scores for situational perceptions for safer sex showed a decline for the experimental (theory-based) intervention group while showed minimal change for the knowledge-based (non-theory) intervention group. The mean self-efficacy scores for safer sex improved from baseline (pretest) to 1-week post-test for both the experimental (theory-based) and the knowledge-based (non-theory) intervention groups. The mean scores for self-efficacy towards barriers for safer sex showed a marked improvement at 1-week post-test for the experimental (theory-based) and knowledge based (non-theory) intervention groups but showed a decline at 6-weeks post-test for both the experimental (theory-based) and the knowledge based (non-theory) groups. Overall the scores showed a marked improvement from baseline to 6-weeks post-test. The mean scores for self-control for safer sex showed improvement at 1-week and 6-week post-test for the knowledge-based (non-theory) group but did not show much change for the experimental (theory-based) group. Safer sex behavioral skills scores showed a marked improvement from baseline (pretest) to 6-weeks posttest for the experimental (theory-based) as well as the knowledge-based (non-theory) intervention groups.
Table 4.6

Table of means and standard deviations of study scales at baseline (pretest), 1-week post-test and at 6-weeks post-test by Experimental (theory-based (n=73)) and non-theory (knowledge-based) (n=68) groups.

<table>
<thead>
<tr>
<th>Variables(Scales)</th>
<th>Group</th>
<th>Baseline(pretest)</th>
<th>1-week post-test</th>
<th>6-weeks posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1) Situational Perception for safer sex</td>
<td>Experimental</td>
<td>73</td>
<td>12.47</td>
<td>4.40</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>68</td>
<td>11.88</td>
<td>4.22</td>
</tr>
<tr>
<td>2) Expectations for safer sex</td>
<td>Experimental</td>
<td>73</td>
<td>78.28</td>
<td>20.85</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>68</td>
<td>76.26</td>
<td>24.49</td>
</tr>
<tr>
<td>3) Self-Efficacy for safer sex</td>
<td>Experimental</td>
<td>73</td>
<td>15.78</td>
<td>5.92</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>68</td>
<td>15.61</td>
<td>6.28</td>
</tr>
<tr>
<td>4) Self-efficacy in overcoming barriers for safer sex</td>
<td>Experimental</td>
<td>73</td>
<td>7.65</td>
<td>4.07</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>68</td>
<td>7.83</td>
<td>4.19</td>
</tr>
<tr>
<td>5) Self-control for safer sex</td>
<td>Experimental</td>
<td>73</td>
<td>14.69</td>
<td>3.26</td>
</tr>
<tr>
<td>6) Safer sex behaviors</td>
<td>Experimental</td>
<td>73</td>
<td>16.45</td>
<td>4.90</td>
</tr>
<tr>
<td></td>
<td>Knowledge-based</td>
<td>68</td>
<td>16.54</td>
<td>4.86</td>
</tr>
</tbody>
</table>
Results of assessment of degree of program fidelity

A set of structured tally sheets that assessed the degree of program fidelity for each of the sessions in each of the workshops for both the experimental (theory-based) and the knowledge-based (non-theory) intervention groups were completed by an independent rater. The results of the percentage of tally check marks for each of the sessions in aggregate are presented in Table 4.7.

There were a total of 14 workshops conducted for the experimental (theory-based) intervention group and an equal number (14 workshops) conducted for the knowledge-based (non-theory) group. It is evident from this table that the program was implemented as it was designed for most of the workshops. In the experimental (theory-based) intervention group, the check marks missed for session 2, were due to non-availability of a video for some of the workshops, and during session 3 due to student reluctance to participate. In the knowledge-based (non-theory) intervention group, the check marks missed in session 3 were due to a video not shown (as a result of a lengthy discussion session) and check marks missed for session 4 were due to students’ reluctance to participate.

Results of changes (before to after intervention) on various SCT construct subscales and safer sex behavioral skills

Situational perceptions for safer sex. Hypothesis #1 stated that African-American students receiving a theory based intervention will have higher situational perceptions for safer sex than African American students receiving a knowledge based intervention.
Table 4.7

Summary of assessment of the degree of program fidelity for each of the sessions at each workshop of both experimental (theory-based) and non-theory (knowledge-based) intervention groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Total number of workshops conducted</th>
<th>Session #</th>
<th>Max possible check marks</th>
<th>Check Marks by Rater 1</th>
<th>Percentage of check marks by rater 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental (theory-based)</td>
<td>14</td>
<td>1</td>
<td>126</td>
<td>126</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>154</td>
<td>150</td>
<td>97.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>126</td>
<td>124</td>
<td>97%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>168</td>
<td>168</td>
<td>100%</td>
</tr>
<tr>
<td>Knowledge-based(non-theory)</td>
<td>14</td>
<td>1</td>
<td>168</td>
<td>168</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>112</td>
<td>112</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>140</td>
<td>132</td>
<td>94.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>126</td>
<td>121</td>
<td>96%</td>
</tr>
</tbody>
</table>
A summary of the analysis of variance (ANOVA) of situational perceptions for safer sex by group-(experimental [theory-based] vs. knowledge-based [non-theory]), and time post-test (1 vs. 6 weeks) is provided in Table 4.8. For the experimental (theory-based) intervention group, the mean situational perception scores for safer sex decreased from 12.47 units at pretest to 11.56 units at 6-weeks post-test (a decrease of 0.91 units) and for the knowledge based(non-theory) intervention group it decreased from 11.88 units at pretest to 11.46 units at 6-weeks post-test (a decrease of 0.42 units).

The null hypothesis for this study was tested by the group and the time x group interaction in the table. The null hypothesis could not be rejected indicating that there were no differences between the experimental(theory-based) intervention group and the knowledge-based(non-theory) intervention group in the change of mean situational perceptions for safer sex score(group p=0.94; time x group p=0.74). There were no significant demographic covariates for the construct of situational perceptions for safer sex in the final ANOVA model.

*Expectations for safer sex.* Hypothesis#2 stated that African American students receiving a theory based intervention will have higher expectations for safer sex than African American students receiving a knowledge based intervention.

A summary of the ANOVA of expectations for safer sex by group (experimental [theory-based] vs. knowledge-based [non-theory]), and time post-test (1 vs. 6 weeks) is provided in Table 4.9.
Table 4.8

Summary of the final model of analysis of variance (ANOVA) for situational perceptions for safer sex by group [experimental (theory-based vs. non-theory (knowledge-based))] and time (1 vs. 6 weeks post-test)

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS\textsuperscript{a}</th>
<th>MS\textsuperscript{b}</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between  subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>1</td>
<td>0.039</td>
<td>0.039</td>
<td>0.01</td>
<td>0.943</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>131</td>
<td>1011.04</td>
<td>7.717</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within  subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>1</td>
<td>8.203</td>
<td>8.203</td>
<td>1.24</td>
<td>0.266</td>
</tr>
<tr>
<td></td>
<td>Time x Group</td>
<td>1</td>
<td>0.702</td>
<td>0.702</td>
<td>0.11</td>
<td>0.744</td>
</tr>
<tr>
<td></td>
<td>Error(time)</td>
<td>131</td>
<td>863.65</td>
<td>6.592</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SS\textsuperscript{a} - Type III sums of squares

MS\textsuperscript{b} = Mean square
For the experimental (theory-based) intervention group the mean expectations scores for safer sex increased from 78.28 units at pretest to 90.33 units at 6-weeks post-test (an increase of 12.05 units) and for the knowledge based (non-theory) intervention group it increased from 76.26 units at pretest to 87.52 units at 6-weeks post-test (an increase of 11.26 units).

The null hypothesis for this study was tested by the group and the time x group interaction in the table. The null hypothesis could not be rejected indicating that there were no differences between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change of mean expectations for safer sex score (group p=0.28; time x group p=0.81). There were no significant demographic covariates for the construct of situational perceptions for safer sex in the final ANOVA model.

Self-efficacy for safer sex. Hypothesis# 3 stated that African American students receiving a theory based intervention will have higher self-efficacy for safer sex than African American students receiving a knowledge based intervention.

A summary of the ANOVA of self-efficacy for safer sex by group (experimental [theory-based] vs. knowledge-based [non-theory]), and time post-test (1 vs. 6 weeks) is provided in Table 4.10. For the experimental (theory-based) intervention group the mean self-efficacy scores for safer sex increased from 15.78 units at pretest to 16.55 units at 6-weeks post-test (an increase of 0.77 units) and for the knowledge based (non-theory) intervention group it increased from 15.61 units at pretest to 16.27 units at 6-weeks post-test (an increase of 0.66 units).
Table 4.9

Summary of the final model of analysis of variance (ANOVA) for expectations for safer sex by group [experimental (theory-based vs. non-theory (knowledge-based))] and time (1 vs 6 weeks post)

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS(^a)</th>
<th>MS(^b)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>1</td>
<td>296.330</td>
<td>296.330</td>
<td>1.19</td>
<td>0.277</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>131</td>
<td>32611.35</td>
<td>248.941</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>1</td>
<td>730.730</td>
<td>730.730</td>
<td>2.47</td>
<td>0.118</td>
</tr>
<tr>
<td></td>
<td>Time x Group</td>
<td>1</td>
<td>17.758</td>
<td>17.758</td>
<td>0.06</td>
<td>0.806</td>
</tr>
<tr>
<td></td>
<td>Error(time)</td>
<td>131</td>
<td>38749.468</td>
<td>295.797</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SS\(^a\) - Type III sums of squares

MS\(^b\) - Mean square
Table 4.10

Summary of the final model of analysis of variance (ANOVA) for self-efficacy for safer sex by group [experimental (theory-based) vs. non-theory (knowledge-based)] and time (1 vs. 6 weeks post-test)

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS(^a)</th>
<th>MS(^b)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy for safer sex</td>
<td>Group</td>
<td>1</td>
<td>1.737</td>
<td>1.737</td>
<td>0.16</td>
<td>0.689</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>131</td>
<td>1423.214</td>
<td>10.864</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>21.380</td>
<td>21.380</td>
<td>3.42</td>
<td>0.066</td>
<td></td>
</tr>
<tr>
<td>Time x Group</td>
<td>1</td>
<td>5.795</td>
<td>5.795</td>
<td>0.93</td>
<td>0.337</td>
<td></td>
</tr>
<tr>
<td>Error(time)</td>
<td>131</td>
<td>818.214</td>
<td>6.245</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SS\(^a\)= Type III sums of squares          MS\(^b\)= Mean square
The null hypothesis for this study was tested by the group and the time \( \times \) group interaction in the Table. The null hypothesis could not be rejected indicating that there were no differences between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean self-efficacy for safer sex score (group \( p=0.69 \); time \( \times \) group \( p=0.34 \)). There were no significant demographic covariates for the construct of self-efficacy for safer sex in the final ANOVA model.

**Self-efficacy in overcoming barriers for safer sex.** Hypothesis\#4 stated that African American students receiving a theory based intervention will have higher self-efficacy in overcoming barriers for safer sex than African American students receiving a knowledge based intervention.

A summary of the ANOVA of self-efficacy in overcoming barriers for safer sex by group (experimental [theory-based] vs. knowledge-based [non-theory]), and time post-test (1 vs 6 weeks) is provided in Table 4.11. For the experimental (theory-based) intervention group the mean self-efficacy scores towards barriers for safer sex increased from 7.65 units at pretest to 10.72 units at 6-weeks post-test (an increase of 3.07 units) and for the knowledge based (non-theory) intervention group it increased from 7.83 units at pretest to 9.98 units at 6-weeks post-test (an increase of 2.15 units).

The null hypothesis for this study was tested by the group and time \( \times \) group interaction in the Table. The null hypothesis could not be rejected indicating that there were no differences between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean self-efficacy towards barriers for safer sex score (group \( p=0.09 \); time \( \times \) group \( p=0.55 \)).
Table 4.11

Summary of the final model of analysis of variance (ANOVA) for self-efficacy in overcoming barriers for safer sex by group [experimental (theory-based vs. non-theory (knowledge-based))] and time (1 vs 6 weeks post-test)

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS(^a)</th>
<th>MS(^b)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy in overcoming barriers for safer sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>1</td>
<td>24.799</td>
<td>24.799</td>
<td>2.93</td>
<td>0.089</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>126</td>
<td>1066.60</td>
<td>8.465</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>1</td>
<td>23.070</td>
<td>23.070</td>
<td>4.36</td>
<td>0.038*</td>
</tr>
<tr>
<td></td>
<td>Time x Group</td>
<td>1</td>
<td>1.855</td>
<td>1.855</td>
<td>0.35</td>
<td>0.554</td>
</tr>
<tr>
<td></td>
<td>Error(time)</td>
<td>126</td>
<td>666.32</td>
<td>5.288</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SS\(^a\)= Type III sums of squares

MS\(^b\)= Mean square
However the main effect of time was significant (p <0.04) implying that while there was no significant difference between the groups, both groups improved between the pretest and the post-test. Having been ever diagnosed with a sexually transmitted disease (p<0.02) and year in school (p<0.01) were significant demographic covariates for the construct of self-efficacy in overcoming barriers for safer sex in the final ANOVA model.

**Self-control for safer sex.** Hypothesis#5 stated that African American students receiving a theory based intervention will have higher self-control for safer sex than African American students receiving a knowledge based intervention.

A summary of ANOVA of self-control for safer sex by group (experimental [theory-based] vs. knowledge-based [non-theory]), and time post-test (1 vs. 6 weeks) is provided in Table 4.12. For the experimental (theory-based) intervention group the mean self-control scores for safer sex decreased from 14.69 units at pretest to 14.52 units at 6-weeks post-test (a decrease of 0.17 units) and for the knowledge based(non-theory) intervention group it increased from 13.80 units at pretest to 14.38 units at 6-weeks post-test (an increase of 0.58 units).

The null hypothesis for this study was tested by the group and the time x group interaction in the table. The null hypothesis could not be rejected indicating that there were no differences between the experimental(theory-based) intervention group and the knowledge-based(non-theory) intervention group in the change of mean self-control for safer sex score (group p= 0.52; time x group p=0.44).
Table 4.12

Summary of the final model of analysis of variance (ANOVA) of construct of self-control for safer sex by group [experimental (theory-based) vs. non-theory (knowledge-based)] and time (1 vs. 6 weeks post-test)]

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS(^a)</th>
<th>MS(^b)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-control for safer sex</td>
<td>Group</td>
<td>1</td>
<td>2.745</td>
<td>2.745</td>
<td>0.41</td>
<td>0.522</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>129</td>
<td>861.86</td>
<td>6.681</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>1</td>
<td>10.059</td>
<td>10.059</td>
<td>1.99</td>
<td>0.160</td>
</tr>
<tr>
<td></td>
<td>Time x Group</td>
<td>1</td>
<td>3.026</td>
<td>3.026</td>
<td>0.60</td>
<td>0.440</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>129</td>
<td>651.93</td>
<td>5.053</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SS(^a) = Type III sums of squares  MS(^b) = Mean square
Having been ever diagnosed with a sexually transmitted disease (p<0.03) and ever having taken a sexuality class (p<0.01) were significant demographic covariates for the construct of self-control for safer sex in the final ANOVA model.

**Safer sex behavioral skills.** Hypothesis#6 stated that African American students receiving a theory based intervention will have higher safer sex behavioral skills score than African American students receiving a knowledge based intervention.

A summary of the ANOVA of safer sex behavioral skills by group - (experimental [theory-based] vs knowledge-based [non-theory]), and time post-test (1 vs. 6 weeks) is provided in Table 4.13. For the experimental (theory-based) intervention group the mean safer sex behavioral skills scores for safer sex increased from 16.45 units at pretest to 17.62 units at 6-weeks post-test (an increase of 1.17 units) and for the knowledge based (non-theory) intervention group it increased from 16.54 units at pretest to 17.50 units at 6-weeks post-test (an increase of 0.96 units).

The null hypothesis was tested by the group and time x group interaction in the table. It was worth noting that the null hypothesis could not be rejected indicating that there were no differences between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change of mean safer sex behavioral skills score (group p=0.99; time x group p=0.85). There were no significant demographic covariates in the final ANOVA model.
Table 4.13

Summary of the final model of analysis of variance (ANOVA) of safer sex behavioral skills by group [experimental (theory-based vs. non-theory (knowledge-based)] and time (1 vs 6 weeks post-test)]

<table>
<thead>
<tr>
<th>Variable(scales)</th>
<th>Source</th>
<th>df</th>
<th>SS^a</th>
<th>MS^b</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Safer sex behaviors</td>
<td>Between</td>
<td>1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.00</td>
<td>0.990</td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.00</td>
<td>0.990</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>126</td>
<td>943.899</td>
<td>7.491</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>1</td>
<td>0.211</td>
<td>0.211</td>
<td>0.03</td>
<td>0.858</td>
</tr>
<tr>
<td></td>
<td>Time x Group</td>
<td>1</td>
<td>0.234</td>
<td>0.234</td>
<td>0.04</td>
<td>0.850</td>
</tr>
<tr>
<td></td>
<td>Error(time)</td>
<td>126</td>
<td>829.139</td>
<td>6.580</td>
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<td></td>
</tr>
</tbody>
</table>

SS^a = Type 11 sum of square  MS^b = Mean square
Assumptions testing on residuals of SCT construct subscales and safer sex behavioral skills

Situational perceptions for safer sex. The assumptions tested for this study on the model residuals of situational perceptions for safer sex were a) normality and b) homogeneity of variance. As indicated in Table 4.14, the normality tests carried out showed that the residuals were non-normally distributed. The reason for the non-normal distribution of the residuals was the presence of outliers that caused the deviation from normality. The Shapiro-Wilk test was found to be highly significant (week 1 post-test residuals: p<0.0001, week 6 post-test residuals: p<0.01). This statistic is the ratio of the best estimator of the variance (based on the square of a linear combination of the order statistics) to the usual corrected sum of squares estimator of the variance (Shapiro, & Wilk, 1965).

The Kolmogorov-Smirnov (K-S) statistic is not significant for the week one post-test residuals (p=0.09) but is significant for the week 6 post-test residual (p<0.01). This statistic is calculated using the sample data compared to a normal distribution with mean and variance equal to the sample mean and variance (SAS Institute, 1999). The Anderson–Darling test gives more weight to the tails of the distribution than does the K-S test by setting a function weighting the squared difference. It is a more powerful test than a K-S test but critical values need to be calculated for each distribution. The Anderson-Darling test was highly significant (p<0.01 for both the one and six week post-test residuals). The Cramer-von Mises test is based on the quadratic class of EDF statistics but the weight function is set to 1. Both the Cramer-von Mises and the Anderson–Darling tests place more weight on the entire data distribution, whereas the K-S test is more sensitive to an aberrance in the sample (Peng, 2004).
Table 4.14

Tests for normality on residuals for the construct of situational perceptions for safer sex

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-week</th>
<th>6-week</th>
<th>P-value</th>
<th>1-week</th>
<th>6-week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Shapiro-Wilk</td>
<td>W</td>
<td>0.950</td>
<td>0.974</td>
<td>&lt;0.01</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2) Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.069</td>
<td>0.094</td>
<td>0.09</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>3) Cramer-von Mises</td>
<td>W-sq</td>
<td>0.177</td>
<td>0.177</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>4) Anderson-Darling</td>
<td>A-sq</td>
<td>1.178</td>
<td>1.050</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

The Cramer-von Mises test was significant (p<0.01 for both the one and six week post-test residuals) Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002)

The homogeneity of variance assumption is that the population variances are equal (Stevens, 2002). The homogeneity of variance assumption was tested on the model residuals of the construct of situational perceptions for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Although Bartlett’s test is sensitive to non-normality (Stevens, 2002), it was not significant for either the 1-week post-test (p=0.65) or the 6-weeks post-test residuals (p=0.41) indicating that the variances are equivalent the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.15)
Table 4.15

**Bartlett’s test for testing homogeneity of variance assumption on residuals for construct of situational perceptions for safer sex**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>0.208</td>
<td>0.647</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.667</td>
<td>0.413</td>
</tr>
</tbody>
</table>

**Expectations for safer sex.** The assumptions tested for this study on the model residuals of expectations for safer sex were a) normality and b) homogeneity of variance. As indicated in Table 4.16, the normality tests carried out showed that the residuals were non-normally distributed. The reason for the non-normal distribution of the residuals was the presence of outliers that caused the deviation from normality. All of the normality statistical tests were significant: Shapiro-Wilk (p<0.01 for both the 1 and 6 week post-test residuals), Kolmogorov-Smirnov (p<0.01 for both the 1 and 6 week post-test residuals), Cramer –von Mises (p<0.01 for both the 1 and 6 week post-test residuals), and Anderson-Darling (p<0.01 for both the 1 and 6 week post-test residuals). Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002).

The homogeneity of variance assumption was tested on the model residuals of the construct of expectations for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Although Bartlett’s test is sensitive to non-normality (Stevens, 2002), it was not significant for either the 1-week post-test (p=0.31) or the 6-weeks- post-test residuals (p=0.86) indicating that the variances are equivalent in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.17)
Table 4.16

*Tests for normality on residuals for the construct of expectations for safer sex*

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-Week</th>
<th>6-weeks</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Shapiro-Wilk</td>
<td>W</td>
<td>0.962</td>
<td>0.950</td>
<td>0.01</td>
</tr>
<tr>
<td>2) Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.125</td>
<td>0.090</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>3) Cramer-von Mises</td>
<td>W-sq</td>
<td>0.339</td>
<td>0.246</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>4) Anderson-Darling</td>
<td>A-sq</td>
<td>1.758</td>
<td>1.445</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

Table 4.17

*Bartlett’s test for testing homogeneity of variance assumption on residuals for construct of expectations for safer sex*

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>1.029</td>
<td>0.310</td>
</tr>
<tr>
<td>6-weeks posttest</td>
<td>1</td>
<td>0.029</td>
<td>0.863</td>
</tr>
</tbody>
</table>

*Self-efficacy for safer sex.* The assumptions tested for this study on the model residuals of self-efficacy for safer sex were a) normality and b) homogeneity of variance. As indicated in Table 4.18, the normality tests carried out showed that the residuals were non-normally distributed. The reason for the non-normal distribution of the residuals was the presence of outliers that caused the deviation from normality. All but one of the normality statistical tests were significant: Shapiro-Wilk (p<0.01 for both the 1 and 6 week post-test residuals), Kolmogorov-Smirnov (week 1 post-test residuals: p<0.15; week 6 post-test residual: p <0.01),
Cramer–von Mises (week 1 post-test residuals: p<0.03; week 6 post-test residuals: P<0.01), and Anderson-Darling (p<0.01 for both the 1 and 6 week post-test residuals). Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002).

The homogeneity of variance assumption was tested on the model residuals of the construct of self-efficacy for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Although Bartlett’s test is sensitive to non-normality (Stevens, 2002), it was not significant for either the 1-week post-test (p=0.48) or the 6-weeks post-test residual (p=0.40) indicating that the variances are equivalent in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.19).

Table 4.18

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-Week</th>
<th>6-weeks</th>
<th>1-week</th>
<th>6-weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Shapiro-Wilk</td>
<td>W</td>
<td>0.965</td>
<td>0.936</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2) Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.062</td>
<td>0.126</td>
<td>0.15</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>3) Cramer-von Mises</td>
<td>W-sq</td>
<td>0.143</td>
<td>0.549</td>
<td>0.03</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>4) Anderson-Darling</td>
<td>A-sq</td>
<td>0.972</td>
<td>3.122</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table 4.19

**Bartlett’s test for testing homogeneity of variance assumption on residuals for construct of self-efficacy for safer sex**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>0.505</td>
<td>0.477</td>
</tr>
<tr>
<td>6-weeks posttest</td>
<td>1</td>
<td>0.722</td>
<td>0.395</td>
</tr>
</tbody>
</table>

**Self-efficacy in overcoming barriers for safer sex.** The assumptions tested for this study on the model residuals of self-efficacy in overcoming barriers for safer sex were a) normality and b) homogeneity of variance. As indicated in Table 4.20, the normality tests carried out showed that the residuals were non-normally distributed. The reason for non-normal distribution of the residuals was the presence of outliers that caused deviation from normality. All of the normality statistical were significant: Shapiro-Wilk (p<0.01, for both the 1 and 6 week post-test residuals), Kolmogorov-Smirnov (p <0.01, for both the 1 and 6 week post-test residuals), Cramer –von Mises (P<0.01, for both the 1 and 6 week post-test residuals), and Anderson-Darling (p<0.01, for both the 1 and 6 week post-test residuals). Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002).

The homogeneity of variance assumption was tested on the model residuals of the construct of self-efficacy towards barriers for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Although Bartlett’s test is sensitive to non-normality (Stevens, 2002), it was not significant for either the 1-week post-test (p=0.74) or the 6-weeks- post-test (p=0.60) indicating that variances are equivalent in both the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.21).
Table 4.20

Tests for normality on residuals for the construct of self-efficacy in overcoming barriers for safer sex

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-Week</th>
<th>6-weeks</th>
<th>p-value</th>
<th>1-week</th>
<th>6-weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Shapiro-Wilk</td>
<td>W</td>
<td>0.936</td>
<td>0.836</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>2) Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.084</td>
<td>0.152</td>
<td>0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>3) Cramer-von Mises</td>
<td>W-sq</td>
<td>0.247</td>
<td>0.963</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>4) Anderson-Darling</td>
<td>A-sq</td>
<td>1.684</td>
<td>5.368</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.21

Bartlett’s test for testing homogeneity of variance assumption on residuals for construct of self-efficacy in overcoming barriers for safer sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>0.110</td>
<td>0.739</td>
</tr>
<tr>
<td>6-weeks posttest</td>
<td>1</td>
<td>0.271</td>
<td>0.602</td>
</tr>
</tbody>
</table>

Self-control for safer sex. The assumptions tested for this study on the model residuals of self-control for safer sex were a) normality and, b) homogeneity of variance. As indicated in Table 4.22, the normality tests carried out showed that the residuals were non-normally distributed. The reason for the non-normal distribution of the residuals was the presence of outliers that caused the deviation from normality. All of the normality statistical tests done were
significant: Shapiro-Wilk (p<0.01, for both the 1 and 6 week post-test residuals), Kolmogorov-Smirnov (1 week post-test residual: p< 0.02; 6 week post-test residuals: p <0.01), Cramer–von Mises (P<0.01, for both the 1 and 6 week post-test residuals), and Anderson-Darling (p<0.01, for both the 1 and 6 week post-test residuals). Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002).

The homogeneity of variance assumption was tested on the model residuals of the construct of self-control for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Bartlett’s test was not significant at 1-week post-test (p=0.354) but was significant at 6-weeks post-test (p<0.02). The significance seen for the 6-weeks post-test residuals may be due to the inherent sensitivity of this test for detecting deviations from normality and hence may have led to an erroneous conclusion that the two groups have unequal variances at 6-weeks post-test (Stevens, 2002). For the 1-week post-test residuals the variances were found to be equivalent in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.23).
Table 4.22

Tests for normality on residuals for the construct of self control for safer sex

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-Week</th>
<th>6-weeks</th>
<th>1-week</th>
<th>6-weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Shapiro-Wilk</td>
<td>W</td>
<td>0.976</td>
<td>0.936</td>
<td>0.01</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>2) Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.081</td>
<td>0.104</td>
<td>0.02</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>3) Cramer-von Mises</td>
<td>W-sq</td>
<td>0.169</td>
<td>0.298</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>4) Anderson-Darling</td>
<td>A-sq</td>
<td>0.950</td>
<td>1.941</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Table 4.23

Bartlett’s test for testing homogeneity of variance assumption on residuals for construct of self control for safer sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>0.857</td>
<td>0.354</td>
</tr>
<tr>
<td>6-weeks posttest</td>
<td>1</td>
<td>6.125</td>
<td>0.013 *</td>
</tr>
</tbody>
</table>

*P<0.05 indicates a statistically significant result

Safer sex behavioral skills. The assumptions tested for this study on the model residuals of safer sex behaviors were a) normality and, b) homogeneity of variance. As indicated in Table 4.24, the normality tests carried out showed that the residuals were non-normally distributed. The reason for the non-normal distribution of the residuals was the presence of outliers that caused the deviation from normality. All of the normality statistical tests were significant Shapiro-Wilk
(p<0.01, for both the 1 and 6 week post-test residuals), Kolmogorov-Smirnov (p<0.01, for both the 1 and 6 week post-test residuals), Cramer –von Mises (p<0.01, for both the 1 and 6 week post-test residuals), and Anderson-Darling (p<0.01, for both the 1 and 6 week post-test residuals). Repeated measures analysis of variance is known to be robust against slight deviations from normality (Stevens, 2002).

The homogeneity of variance assumption was tested on the model residuals of the construct of expectations for safer sex at 1-week post-test and at 6-weeks post-test by using Bartlett’s test for homogeneity of variance. Although Bartlett’s test is sensitive to non-normality (Stevens, 2002), it was not significance for either the 1-week post-test (p=0.67) or the 6-weeks- post-test (p=0.31) indicating that the variances are equivalent distributed in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups (Table 4.25).

Table 4.24

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>1-Week</th>
<th>6-weeks</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)Shapiro-Wilk</td>
<td>W</td>
<td>0.905</td>
<td>0.942</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2)Kolmogorov-Smirnov</td>
<td>D</td>
<td>0.114</td>
<td>0.112</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>3)Cramer-von Mises</td>
<td>W-sq</td>
<td>0.424</td>
<td>0.332</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>4)Anderson-Darling</td>
<td>A-sq</td>
<td>2.544</td>
<td>1.952</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table 4.25

*Bartlett’s test for testing homogeneity of variance assumption on residuals for safer sex behavioral skills*

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group - 1-week posttest</td>
<td>1</td>
<td>0.176</td>
<td>0.674</td>
</tr>
<tr>
<td>6-weeks posttest</td>
<td>1</td>
<td>1.015</td>
<td>0.313</td>
</tr>
</tbody>
</table>

**Conclusions**

There are number of conclusions that can be drawn from the results of this study.

1) The results of the pretest data confirm that the students assigned to the experimental (theory-based) and the knowledge-based (non-theory) intervention group did not differ in terms of the demographic variables.

2) The mean change in scores for various constructs of social cognitive theory (situational perceptions for safer sex, expectations for safer sex, self-efficacy for safer sex, self-efficacy towards barriers for safer sex and self-control for safer sex) were not significantly different between pre- and post-intervention.

3) The process evaluation done in the form of assessment of program fidelity proved that the intervention programs for the experimental (theory-based) group and the knowledge-based (non-theory) groups were implemented as planned for the most part; and

4) The tests of assumption on the model residuals of study construct showed deviations from normality which were attributed to outliers in this study. The variances were equivalent in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups.
The next section of this study discusses these results in greater detail and provides final conclusions. Some implications for health promotion practitioners and recommendations for future researchers engaging in a behavioral intervention study of similar kind are provided.
Chapter 5

Discussion and Conclusions

The purpose of this study was to test the efficacy of a brief social cognitive theory based safer sex intervention among African-American college student. The current study used five constructs of the social cognitive theory including expectations for safer sex (outcome expectations x outcome expectancies), situational perceptions for safer sex, self-efficacy for safer sex, self-efficacy in overcoming barriers for safer sex, and self-control for safer sex. The knowledge construct of the social cognitive theory was not used as it was believed that college students had a good knowledge about HIV/AIDS and sexually transmitted diseases along with use of safer sex behaviors to prevent getting a disease. The environment construct was also not used in this study as it is difficult to modify the physical and social circumstances of individuals. A parsimonious model was used in this study which included five constructs from social cognitive theory. The number of constructs were more than the number of constructs used in any of the previous studies related to this topic (Strader & Beaman, 1991; Wulfert, & Wan, 1995). Along with the Information-Behavioral-Skills model, Social Cognitive Theory has been used extensively in reducing HIV risk behaviors and sexually transmitted diseases in heterosexual African-Americans (Darbes, et al., 2008; Semann et al., 2002). Furthermore brief interventions in African-American adolescents especially in school-based and community settings have been effective in promoting safer sex behaviors (Ickes, & Sharma, 2007). Hence, the current study tests a social cognitive theory based brief intervention for safer sex behavioral change among a target population of African-American college students. This chapter discusses the results of this study, considers the limitations of these results, presents the main conclusions, addresses the implications of this study for practitioners and makes recommendations for future research.
Changes in the constructs of Social Cognitive Theory

Situational perceptions for safer sex. The construct of situational perception for safer sex was operationally defined as insights pertaining to condom use and having monogamous relationships and was measured by a 4-item subscale with a possible range of 4-20. There were no differences in change (from before to after intervention) in mean situational perceptions for safer sex score between the experimental (theory-based) and knowledge-based (non-theory) intervention groups (group p=0.94; time x group p=0.74). The mean scores at baseline were on the higher side {experimental (theory-based) [M=12.47] knowledge-based (non-theory) [M=11.88]} indicating that the insights related to condom usage and a monogamous relationship were already realized by these students. Students awareness about issues such as condom use depending on its availability and partner characteristics were developed during their formative years in school and via peer interaction. The experimental (theory-based) intervention attempted to build on these insights by identifying prevailing norms about safer sex and rectifying any misconceptions the students may have had about safer sex, while the knowledge-based (non-theory) intervention tried to alter student perceptions via information shared and videos shown related to condom usage. There was a decrease in the situational perceptions for a safer sex score of 0.91 units from baseline to 6-weeks post-test implying that these insights could not be further altered or improved upon in the given time-frame of 6 weeks. A two-hour one time intervention with a follow-up period as short as 6 weeks duration may be insufficient to make any substantial change in situational perceptions regarding safer sex. No previous study addresses situational perceptions for safer sex among students, in particular among African-American college students. The items used in this scale were based on a literature review and on the
recommendations of the subject experts. It is possible that these items may not address issues that are important to the study sample.

*Expectations for safer sex.* The construct of expectations was comprised of a multiplicative score of outcome expectations and outcome expectancies which were then added up to obtain the summary score. There were four items for outcome expectations each on a scale of 1-5 and four items for outcome expectancies each on a scale of 1-5, yielding a possible range of 4-100. For this construct, there was no significant change (from before to after intervention) for the experimental (theory-based) and knowledge-based (non-theory) based group (group p=0.28; time x group p=0.81). Students in both intervention groups had scores for expectations for safer sex on the very high side at baseline (Experimental-M=78.28; Knowledge-based-M=76.26) implying they had a greater than average knowledge about the benefits and importance of condom usage and a monogamous relationship for avoiding HIV/AIDS and sexually transmitted diseases (students may be having a good knowledge due to media influence, sexuality related health classes taken in past or peer influence). The mean scores improved from baseline to 1-week post intervention by 7.82 units in the experimental (theory-based) group but also showed an improvement of 6.28 units for the knowledge –based (non-theory) group. A similar improvement was also seen at the end of 6-weeks (Experimental- 4.23 units and knowledge-based-4.98 units). This change although not practically or statistically significant showed that both interventions improved student outcome expectations about safer sex (such as being healthier, feeling protected, worrying less about catching a sexually transmitted disease, and feeling a sense of confidence about their sexual experiences). Since no previous studies that researched expectations related to safer sex among African-American college students had been done, this study relied on advice from subject experts, experience of the researcher and consultations with
selected students from the target population to arrive at a possible set of expectations for measurement and modification via the intervention. While conducting experimental intervention sessions with students during the workshops, it was seen that the students mentioned few additional outcomes such as preventing pregnancy, and better communication with their significant others. Hence building on the four expectations mentioned in this study and adding some additional expectations, the list of possible expectations can be broadened in the future research to improve the measurement of and interventions for safer sex.

Self-efficacy for safer sex. The construct of self-efficacy for safer sex was operationally defined as the confidence that an undergraduate college student had in his or her ability to initiate condom use while indulging in sexual intercourse, be consistent in its usage on every occasion and correct in its usage at all times. In this study self-efficacy for safer sex was measured by a 5-item scale with a possible range of 5-25. For this construct the change (from before to after intervention) showed no difference between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean self-efficacy for safer sex score (group p=0.69; time x group p=0.34). The mean self-efficacy scores for safer sex increased from the baseline scores to the 1-week post test substantially for the experimental (theory-based) group (by 1.16 units) as well as for the knowledge-based (non-theory) group (by 1.65 units). This change although not significant implies that students in both the experimental (theory-based) and knowledge-based (non-theory) group developed confidence for engaging in safer sex activities. In the experimental (theory-based) group an effort was made to improve self-efficacy skills by multiple demonstrations of condom usage using a penile model and by showing a culture-centric video of a role model demonstrating condom usage. Surprisingly self-efficacy skills also showed improvement at 1-week post-test in the knowledge-based (non-theory) group where videos which discussed condom usage skills and
condom use advantages and disadvantages were discussed. This seems to suggest that some of the sessions in the knowledge-based (non-theory) intervention proved to facilitate confidence building in the given study sample.

**Self-efficacy in overcoming barriers for safer sex.** The construct of self-efficacy in overcoming barriers for safer sex was operationally defined as the confidence that an undergraduate college student will have the ability to initiate condom use when while indulging in sexual intercourse, be consistent in its usage on every occasion and be correct in its usage at all times when faced with barriers. In this study self-efficacy in overcoming barriers for safer sex was measured by a 4-item scale with a possible range of 4-20. For this construct, no differences were noted between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean self-efficacy towards barriers for safer sex scores (group p=0.09; time x group p=0.55). However, the improvement of scores in both groups was significant over 6-weeks (p<0.04). The baseline scores for the construct of self-efficacy in overcoming barriers for safer sex was quite low for both groups [Experimental (theory-based)- M=7.65, Knowledge-based (non-theory)-7.83]. This clearly indicates that students faced difficulties in using condoms due to several reasons such as reducing sexual pleasure, sexual partner being uncomfortable using it, and when under the influence of alcohol. After some brainstorming and an informal discussion with students in the experimental (theory-based) intervention workshop, it was clear that students faced a number of barriers when it came to condom usage in addition to the ones identified by the researcher. Some of the additional barriers were intercourse happening spontaneously, and trusting their partners. These barriers can be added to the barriers mentioned in this study in developing measurement instruments and interventions in the future. Self-efficacy in overcoming barriers for safer sex were addressed in the experimental (theory-based) intervention by using an informational talk on various barriers
commonly encountered by students. Students were asked to state some common barriers and then ways of overcoming these barriers were discussed with them. The scores at 1-week post-test increased by 4.13 units in the experimental (theory-based) group and by 3.59 units in the knowledge-based (non-theory) intervention group. The probable reason for increased scores in the knowledge-based (non-theory) intervention group may be that one of the sessions in the knowledge based intervention workshop discussed common problems (such as failure to use them with every act of sexual intercourse, failure to use throughout the sexual intercourse, condom breakage, condom slippage) and disadvantages of condom usage (such as sensitivity, losing spontaneity, lack of partner cooperation) and how one can deal with them. Although the mean scores dipped from 1-week post-test to 6-weeks post-test, an overall increase in mean scores was seen at 6-weeks post-test for both the experimental (theory-based) and the knowledge-based (non-theory) intervention group.

Two significant demographic covariates for this construct were found: having ever been diagnosed with a sexually transmitted disease (p<0.02) and year in school (p<0.01). These results indicate that students who were ever diagnosed with a sexually transmitted disease and who were in higher grades at school had better confidence in using safer sex skills, such as consistent condom usage and maintaining a monogamous heterosexual relationship when faced with the impediments mentioned earlier.

*Self-control for safer sex.* The construct of self-control for safer sex was operationally defined as the ability of an undergraduate college student to self-reward upon adequate accomplishment of safe sexual behavior (i.e. condom use every time sexual intercourse was engaged in and having one partner from the first initiation of sexual intercourse) and self-set goals. In this study self-control about safer sex was measured by a 4-item scale with a range
of 4-20. For this construct no differences were noted between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean self-control for safer sex score (group \( p=0.52 \); time \( x \) group \( p=0.44 \)). Self-control for safer sex was addressed in the experimental (theory-based) group by a lecture on goal-setting followed by an exercise in which the participants were asked to write proximal and distal goal statements (e.g. ‘I’ll try to use condoms every time I have sexual intercourse in the next three months or I’ll be having just one sexual partner in the next 6 months’). The mean scores for self-control for safer sex increased by 0.70 units for the experimental (theory-based) group at 1-week post-test and by 1.17 units for the knowledge-based (non-theory) group at 1 week post-test. This seems to suggest that this construct was better modified by the students in the knowledge-based (non-theory) intervention group. Overall the mean scores for self-control for safer sex increased for the knowledge-based (non-theory) group at the end of 6 weeks by 0.58 units, although this was not significant. Taking into account the recommendations of the subject experts, knowledge of the researchers and inputs from the target population, it was thought that we might operationalize the goal-setting dimension to a greater extent than the self-reward dimension of self-control. The range of the measurement scale was limited to 4-20 units and scores were found to be on the higher side (over 13 units at baseline and at 1-week and 6-week post-test). This could mean that these students had a higher goal setting ability at all times. This seems to indicate that there could have been a need of operationalizing this construct in a different way that includes monitoring of one’s own behavior and its determinants and effects; comparison of behaviors and their outcomes to personal standards and also building self-efficacy i.e. confidence in self-regulation (Glanz, Rimer, & Lewis, 2002). Researchers and practitioners in future should improve measurement of this construct by operationalizing it in a more comprehensive way.
Two significant demographic covariates for this construct were found: having ever been diagnosed with a sexually transmitted disease (p< 0.02) and having ever taken a sexuality class (p<0.01). These results indicate that the students who were ever diagnosed with a sexually transmitted disease and who had taken a sexuality class anytime in their lives had increased self-control (goal setting skills and improved monitoring of their activities) when it came to safer sex behaviors such as consistent condom usage and maintaining a monogamous heterosexual relationship.

**Safer sex behavioral skills.** In this study, the safer sex behavior score was operationally defined as correct and consistent condom usage while engaging in sexual intercourse and having only one sexual partner ever (monogamy). In this study, the safer sex behavior scores were measured by a 5-item scale with a possible range of 5-25. There were no differences between the experimental (theory-based) intervention group and the knowledge-based (non-theory) intervention group in the change in mean safer sex behavioral skills score (group p=0.99; time x group p=0.85). The mean safer sex behavior scores increased by 0.81 units at 1-week post-test for the experimental (theory-based) group and by 0.93 units for the knowledge-based (non-theory) intervention group. There was a marginal but sustained increase in scores at 6 weeks for both the groups. It seems that both groups had a good knowledge about HIV/AIDS and sexually transmitted disease along with recognized ways of risk reduction at the beginning of the study. In the experimental (theory-based) intervention group, sessions which tended to modify the behavioral capability of the students increased their knowledge about safer sex skills (such as discussion of male and female condom fact sheets and informal discussion about ‘safer sex’ with adequate debriefing). In the knowledge-based (non-theory) intervention group, sessions which
discussed condom usage and importance of a monogamous relationship helped improve the existing knowledge of safer sex behavioral skills.

Student participants in the experimental (theory-based) and the knowledge-based (non-theory) intervention groups were randomly assigned at pretest (baseline) and were found to be equivalent at pretest in terms of all measured variables. Hence any threat to internal validity due to selection bias was minimal. Since this intervention study was of a brief duration (six weeks total), any threat to maturation is also likely to be minimal. As far as attrition of the student participants in the study, it also was minimal (<10%) at the end of 6-weeks of the study. Based on the current criteria for best evidence behavioral interventions a retention rate of 70% or greater in each study arm (group) is considered as being a positive outcome (Amico, 2009). The attrition rates were not found to be different for the experimental (theory-based) and the knowledge-based (non-theory) intervention groups. Student participant retention rates were maintained in the study (>90%) by sending them repeated reminders via e-mails and telephone.

Dose of intervention and program fidelity assessment

The current study tested the effects of a brief intervention based on the constructs of social cognitive theory (experimental intervention) compared to a knowledge-based (non-theory) intervention in modifying safer sex behavioral skills in a sample of African-American college students. This was a one-time intervention [where the intervention was in the form of multiple workshops conducted among African-American student participants at a large mid-western university - the contact time per group was two hours]. There were no significant differences observed in mean score change for various constructs (situational perceptions for safer sex, expectations for safer sex, self-efficacy for safer sex, self-efficacy towards barriers for safer sex, and self-control for safer sex) of the social cognitive theory at 1-week posttest and at 6-week
posttest, in the experimental (theory-based) intervention and knowledge-based (non-theory) intervention groups. This is primarily attributed to the dose of intervention the student participants were exposed to in this study. It seems very probable that a onetime intervention exposure of 2-hours duration is insufficient to modify constructs of social cognitive theory and increase safer sex behavioral skills. Also the testing period at the end of 1 week and 6 weeks may be insufficient to see any significant changes in these constructs along with improvement in safer sex behavioral skills.

A comprehensive review of the literature in the arena of safer sex interventions in African-American adolescents in the settings of community, family or school concluded that duration of intervention (length of individual sessions and the number of sessions) and the time-span over which they were distributed was critical for making a significant behavioral change among participants (Ickes, & Sharma, 2007). Furthermore it can be said that more frequent interventions e.g. seven versus three sessions (while keeping the total instructional time the same) produced greater behavioral change in study participants (Rotheram-Borus et al., 1998). The numbers of sessions were only four in this study with each session lasting a half-hour (the total instructional time was therefore two hours). Understandably this may be inadequate to improve knowledge or encourage safer sex behavior in the student participants. A meta-analytic review on behavioral interventions for risk reduction related to HIV/AIDS and sexually transmitted diseases in heterosexual African-Americans suggested that interventions with increased instructional time and session frequency spread over multiple weeks show significant behavioral change. Also a follow-up time of 3 - 6 months was needed to show an increase in safer sex behaviors such as condom usage (Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008). This study showed non-significant results at six weeks and a hence a long-term follow up was not done.
As for the fidelity of intervention program implementation, the same instrument was administered by the same person, in similar circumstances to the experimental (theory-based) and the knowledge-based (non-theory) intervention groups. The researcher was the sole person who implemented the experimental (theory-based) and the knowledge-based (non-theory) interventions (in the form of workshops among African-American college students), thus minimizing bias due to differential teaching styles, personalities and values of two or more health educators or practitioners. There was a minimal discrepancy between the way the interventions were planned and the way they were implemented as measured by structured tally sheets. The tally sheets were rated by an independent rater for both the experimental (theory-based) and the knowledge-based (non-theory) intervention groups. The same rater was present to rate the tally sheets throughout the intervention implementation period.

Limitations of the study

Besides the delimitations and limitations mentioned in Chapter 1, some additional ones need to be discussed before stating the conclusions of this study. The set of instruments developed for this study (using a theoretical framework of social cognitive theory) used and operationalised five different constructs of social cognitive theory for the first time. Although the instrument had acceptable reliability and validity further improvement is possible. Some of the constructs such as situational perceptions and self-control could have been operationalized in greater detail. The expectations construct also could have been more comprehensively operationalized. Some modifications could have served a dual role of not only improving the measurement of these constructs but also comprehensively addressing the dimensions that these constructs were supposed to be measuring while also developing them to quantify the affect of a theoretically based intervention.
As discussed in Chapter 1, self-reports were used for data collection (which is the only way of collecting sensitive data as needed in this study). There are potential drawbacks to self-reported data collection such as deliberate or unconscious distortions of data (Polit, & Hungler, 1991). Some of these may be due to an inability to recall events. Social desirability bias may have been evident in this study, especially when students were asked to reveal whether they had any sexually transmitted disease in the past, or the number of sexual partners they had in last year. There was a selection bias as students having higher grade point average were part of this study. Underreporting the number of partners or over reporting the number of partners was a possibility and there was no way for this to be controlled.

The program fidelity assessment was carried out by maintaining structured tally sheets by an independent rater. Assessment of program fidelity by two independent raters could have strengthened this study.

Finally as stated in chapter 1, the study sample of African-American students (from a large mid-western university) was not randomly selected and hence the results of this study cannot be generalized to African-American students at other campuses or elsewhere in the state of Ohio or the nation. Any generalizations that may be made, are subject to this limitation.

**Conclusions**

Based on the results of this study, it can be concluded that there is no difference between a brief theory-based intervention (based on social cognitive theory) and a brief knowledge-based intervention in terms of efficacy in developing safer sex behavioral skills in a study sample of African-American college students at a large mid-western University. The constructs of expectations for safer sex, self-efficacy for safer sex, self-efficacy towards barriers for safer sex, and self-control for safer sex showed a mean improvement in scores from baseline to 6-weeks.
post-test for both the experimental (theory-based) and knowledge-based (non-theory) intervention groups (which was neither statistically nor practically significant).

Dose of the intervention was an important factor which emerged from this efficacy study. The experimental (theory-based) intervention failed to show efficacy in eliciting changes in the constructs of social cognitive theory along with safer sex behavioral changes, due to inadequate intervention.

This study provides a small but important additional amount of information for behavioral interventions addressing HIV/AIDS and sexually transmitted disease prevention among African-American adolescent/college population. This is the first research study in which an attempt was made to operationalize five constructs of social cognitive theory in a measurement instrument that met acceptable standards of reliability and validity. Furthermore this study had a rigorous research design and comprehensive statistical analyses were performed. Finally although the follow-up period was not extensive, this study met very high standards for participant retention and had only a small number of participants lost-to-follow-up.

This study focused on process (degree of fidelity in program implementation) and impact (antecedents of behavior and skills) evaluation. Hence based on this study, no conclusions can be made regarding the efficacy of this intervention on outcomes such as rates of HIV/AIDS and sexually transmitted diseases and morbidity and mortality in populations due to these diseases.

Implications for practice

The findings of this study have important implications for health promotion professionals who are developing and validating an instrument based on five constructs of social cognitive theory and implementing a brief theory-backed intervention for safer sex promotion. This study reaffirms the findings of previous studies which discuss the ‘dose of an intervention’ (which
includes session length and number of sessions along with the total duration of the intervention period) and its relationship in modifying the sexual behaviors of African American adolescents and college students (Darbes et al., 2008; Ickes, & Sharma, 2007). Although self-efficacy and expectancies were some of the important components identified in previous successful safer sex promotions (Strader, & Beaman, 1991; Wulfert, & Wan, 1995), in this study the baseline scores for these constructs were relatively higher (i.e. the means of these constructs were quite high at baseline in this particular study sample of African-American college students). The high baseline scores probably made demonstrating a significant modification due to the interventions much more difficult. One of the limitations of the social cognitive theory is that it may not be a strong behavior change theory unlike the stages of change theory (especially when assessing the readiness of the study sample for behavior modification). Finally, as discussed earlier, the addition of additional components to constructs such as expectations for safer sex and situational perceptions for safer sex along with detailed operationalization of self-control for safer sex (practitioners can use educational processes which address self-monitoring of safer sex activities such as consistent condom usage or practicing monogamy and compare their actual practice with their self-set goal) will strengthen the measurement instrument along with improving intervention effect.

This study assessed the program fidelity by using structured tally sheets as a part of process evaluation. Although this study used a single independent rater, future studies done by health promotion practitioners can include two independent raters with this methodology to assess the extent of adherence between the planned and the implemented intervention program. This would minimize any error committed and hence further strengthen the study.
Recommendations for future research

This brief interventional study showed no significant difference between an experimental (theory-based) and a knowledge-based (non-theoretical) intervention program in modifying SCT constructs or altering safer sex behaviors. Recommendations for future research can be made primarily on two aspects of this study a) the measurement instrument and b) the intervention dose and duration.

The measurement instrument can be further modified by developing other subscales such as situational perceptions for safer sex, and expectations for safer sex from systematic qualitative inquiry. Some of the constructs such as self-control for safer sex can be expanded by operationalization of all of the underlying dimensions.

This was a brief interventional study (of six weeks) duration that included a pretest, two randomly assigned interventions and two follow-up post-tests at the end of one week and after six weeks post-intervention. The literature on HIV/AIDS and sexually transmitted diseases risk reduction interventions have found that it is beneficial to increase the length and/or the frequency of intervention sessions along with a follow-up period of atleast three months duration (Darbes et al, 2008; Ickes, & Sharma, 2007).

Behavioral interventions recommended for future researchers based on this study should aim at the following issues: improved operationalization of the theory, and increased frequency of sessions (i.e. spread out the intervention over a longer time interval). Another interesting observation is that interventions implemented by African-American health educators have been found to cause more effective behavioral change than when implemented by other health educators (Ickes, & Sharma, 2007). The current study was conducted by a non-African-American researcher.
Based on this information, a prototype design that is recommended for future researchers is:

- a baseline pretest;
- an intervention comprising about seven sessions (the interventions may be based on the experimental[theory-based] and/or the knowledge-based [non-theory] approaches with each intervention session being about 90-120 minutes in duration). The intervention sessions should be spread over 4 weeks in total;
- post-test 3 months after the last intervention session;
- 2-booster intervention sessions in the following two weeks;
- another post-test 6 months post-intervention.

It also would be an interesting idea to include a control group in this study design, such as one involving general health promotion that would focus on topics like nutrition, physical activity and stress reduction to provide a comparator to the intervention groups. (Diclemente, et al., 2004; Jemmott, Jemmott, & Fong, 1998; Diclemente, & Wingood, 1995). Furthermore a control group in the forms of delayed HIV educational session or the usual campus health-related knowledge awareness group( including knowledge about sexuality issues) can be incorporated in future studies.

**Summary**

In summary, it can be said that a behavioral intervention study developed to modify theoretical constructs and to promote safer sex behaviors must focus on to two important issues:

1) Measurement issues of instrument scale building i.e developing a valid and a reliable instrument; and

2) Maintaining a sufficient intervention dose which is adequately spread. Improvements in operationalization of study constructs and major modifications in the dose of the intervention
delivered should facilitate the causation of significant changes in the theoretical constructs and promotion of safer sex behaviors.
BIBLIOGRAPHY


Appendix A

Copy of Letter to subject experts

April 28, 2007
449 Riddle Road
Apt. No 2, Cincinnati
OH, 45220.

Dear Dr. Petosa,

I am a doctoral student in Health Education and Health Promotion at University of Cincinnati and I am conducting my doctoral research in the area of safer sex behaviors among college students. The tentative title of my dissertation is, “Use of Social Cognitive Theory based Safer Sex Intervention among college students”. Based on your expertise in the subject matter of safer sex behaviors and college students, I am requesting you to kindly comment on the choice of items and scaling method in the attached instrument. Additionally, you are requested to read the definitions and comment upon each item and subscales with regard to the following:

- Readability: Is the meaning of each item clear and language appropriate for an undergraduate college student?
- Face Validity: Does each item appear to measure the intended construct as operationally defined?
- Content Validity: Do the items adequately assess each Social Cognitive Theory construct within the universe of content as operationally defined?

Kindly respond to all the questions and return the instrument with your valuable comments to me by . After making changes based on the inputs from you I will distribute the instruments to an expanded expert panel (of which you will also be the members) for two round review process. If you have any questions I can be reached at 540-267-6494(cell). I am extremely thankful for your time and would like to convey my anticipatory gratitude for your valuable comments on the instruments.

With warm regards.

Sincerely,

Amar Kanekar, MBBS, MPH
Appendix B

List of subject experts and target population representatives

The following is a list of 4 subject experts

1) Linda Goldenhar, PhD
   Assistant Dean, MED-Dean's Office
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3) Rick Petosa, PhD
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4) Manoj Sharma, MBBS, PhD
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   Fax :(513)-556-3898
   E-mail:manoj.sharma@uc.edu
Target Population representatives

1) Kareemah Mills
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2) Candice Jones
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   E-mail: jonc6@email.uc.edu
Appendix C

Session details for the experimental (theory-based) group.

Table C1

Session 1  HIV/AIDS and Safer sex behaviors

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
<th>CONSTRUCTS OF SCT * USED</th>
</tr>
</thead>
</table>
| 1                  | • Introduction Define and explain what is HIV (Human immunodeficiency virus infection) and what does the term AIDS (Acquired Immunodeficiency syndrome) mean  
• Human immunodeficiency virus is a organism which causes infection when it enters the human body.  
• AIDS (Acquired Immunodeficiency syndrome) is a set of symptoms and | Get responses to the word “HIV” and “STD” from the students. List them on a flipchart or on a blackboard. Build on student responses and explain the meaning of these terms in detail. (Teaching aid: PowerPoint Presentation and HIV/STD information video will be used SEE APPENDIX-I) | 10 mins(prompt students for atleast 2 mins to get their responses to the word “HIV”) | Behavioral Capability -- Knowledge and skill to perform a behavior (Glanz, Rimer, & Lewis, 2002). |
infections resulting from the damage to the human immune system caused by human immunodeficiency virus. (Explanation of this will be given)

2 & 3

- Introduction to brainstorming
- Debriefing the students about what safer sex and sexually transmitted diseases are and the mode of spread.
- Ask students to share any experiences related to safer sex behaviors or sexually transmitted diseases.

Introduce the term ‘safer sex’ and ask students ‘what does it mean for them’. Write all their answers on flip-chart or blackboard. Do not evaluate or judge any answer however funny. Once the students get a feel of this technique ask them to mention some of the common sexually transmitted diseases they know of. List these diseases and complete it if students fail to know of any. Students will come out with their explanations about safer sex behaviors and the health educator will debrief and rectify any misconceptions relating to what is safe and unsafe sex and how to prevent unsafe sex.

20 mins (includes few minutes to reflect on student responses).

Behavioral capability
Knowledge and skill to perform a behavior (Glanz, Rimer, & Lewis, 2002)

Situational Perception
How one perceives and interprets the environment around oneself (Sharma, & Romas, 2008)
<table>
<thead>
<tr>
<th>Total</th>
<th>30 minutes</th>
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</table>
# Session 2. Condom use information and skill building by practice

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1                  | • Appropriate condom usage methods will be demonstrated and practiced  
|                    | • (condom packets of various size condoms will be brought and students will be taught of how to read instructions mentioned on the packet and apply them while using the condoms) |

**Demonstration technique** will be used by the health educator where he/she will initially show the participants ways of opening the condom packet without tearing the condom, using correct side of the condom for rolling and showing how to keep some space at the end. The importance of the correct technique of opening the condom packet and technique of unfolding will be emphasized and explained by the health educator. A male and a female participant from the audience will be asked to perform the correct usage technique as demonstrated by the health educator.

<table>
<thead>
<tr>
<th>TIME</th>
<th>CONSTRUCTS OF SCT* USED</th>
</tr>
</thead>
</table>
| 15 mins (10 mins for demonstration and explanation of correct condom usage and 5 mins for student demonstration) | Self-Efficacy  
Confidence in one’s ability to pursue a behavior (Sharma, & Romas, 2008) |
2

- Discuss a male-condom fact sheet with the participants
- Learning of condom insertion skills using a penile model

Each student will get a male-female condom fact sheet which details the structure, and the ways of using it. (SEE APPENDIX J)

The health educator will highlight important parts of the contents by loud reading.

A penile-model demonstration will then be followed of condom insertion by the health educator.

Students (a male and a female participant) will then try practicing putting on the condom on the penile model to get the actual feel of the process. This will be done repeatedly for 2-3 times till they are comfortable with the process.

5 mins (condom fact sheet distribution and highlighting important aspects)

8 mins (demonstration by health educator followed by practice by the students on the model).

Behavioral Capability

Knowledge and skill to perform a behavior (Glanz, Rimer, & Lewis, 2002)

Self-efficacy

Confidence in one’s ability to pursue a behavior (Sharma, & Romas, 2008).

- practicing in small steps
<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Description</th>
<th>Time</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>Video</td>
<td>Viewing of a correct condom use advertisement or a message. Students will be shown a video about appropriate usage of condoms (this video will have a role-model such as an athlete or a movie star) (SEE APPENDIX-J)</td>
<td>2 mins (This will be a short-video of about 2 mins).</td>
</tr>
</tbody>
</table>

**Total** | **30 mins** | **Self-Efficacy**
Confidence in one’s ability to pursue a behavior (Sharma, & Romas, 2008).
--- Role-modeling used.
## Session 3. Discussion on personal barriers to condom usage and communication skills building

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
<th>CONSTRUCT OF</th>
</tr>
</thead>
</table>
| 1                  | - Brainstorming among the students about the barriers they feel about condom usage.  
- Informational talk about the common barriers among adolescents and college students while using condoms and/or engaging in safer sex behaviors. | Students will be divided into 5 small groups (7 students in each group). Each group will be asked to come out with at least 3 barriers they face while using condoms. A list of all the barriers mentioned by the students will be put up on a blackboard or a flip-chart. The health educator will debrief the students about common barriers while engaging in safer sex behaviors and ways to overcome it. (Informational talk about common barriers to condom usage) | 5 mins (for students to come out with barriers and making a list of barriers)  
5 mins (debriefing and informational talk by the health educator) | Self-efficacy towards overcoming barriers  
Confidence that a person has in overcoming barriers while performing a given behavior (Sharma, & Romas, 2008). |
• Ways of communication skill building between a male and a female participant will be discussed by the health educator.

• Techniques such as role playing among students will be used along with some scenarios which mimic real life situations.

The session will begin with an informational given by the health educator about 3 different styles of introducing a male condom:
(a) “directive”- where either of the partners may use a straightforward verbal expression to inform their partners of their desire or intention to use condoms.
(b) “suggestive”- where either partners may use less affirmative tone to inform their partners about their desire to use condoms.
(c) “indirect”- where either partners may express their desire to use condoms in vague terms that are non-confrontational and posed as a question.

Students will be divided into 5 groups of 7 students each.

Role –playing will be done by two students from each group with the help of the health educator. The session duration is as follows:

- Informational talk: 5 minutes
- Script distribution and role playing: 15 minutes

Behavioral Capability

Knowledge and skill to perform a behavior (Glanz, Rimer, & Lewis, 2002)

Communication skill building for condom usage.
of textual scripts handed to them by the health educators.

These scripts will mimic real-life situations faced by adolescents when confronted with desire to communicate safer sex behaviors and condom negotiation skills.

Total

30 mins.
### Session 4. Rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior.

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
<th>CONSTRUCTS OF SCT* USED</th>
</tr>
</thead>
</table>
| 1 & 2              | • Discussion of the health educator with the students about rectifying misperceptions (the basis will be earlier role-play and issues coming out from those)  
• Various favorable outcomes will be discussed by the health educator. | Students will be divided into 5 groups having 7 students in each group. Each group will be asked to identify what do they feel are the prevailing norms for condom usage or having sexual partners. (e.g., do they think that everyone uses condoms while having sex, do they feel that everyone is having just one sexual partner, do they feel that condom usage depends on availability). They will be asked to write them down on a sheet of paper. The health educator will pose such questions and then debrief them with healthy social norms. | 20 mins (this includes group formation, discussion, and debriefing) | Situational Perception  
How one perceives and interprets the environment around oneself (Sharma, & Romas, 2008) |
Lecture on goal-setting given by the health educator where the health educator will delineate ways of personal goal setting (proximal and distal). A hypothetical plan setting will be shown to the participants. Use of flip-chart or

Ask the students in each group to come out with 3-4 outcomes that they expect with safer sex behaviors and ask them to highlight the most important one. They will be asked to write them down on a sheet of paper.

List all the outcomes on a flip-chart or a blackboard and also underline the ones which are important for the students.

Outcome Expectations
Anticipation of the probable outcomes that would ensue as a result of engaging in the behavior under consideration (Sharma, & Romas, 2008).

Outcome expectancies
Value a person places on probable outcomes that result from performing a behavior (Sharma, & Romas, 2008).

Lecture on goal-setting given by the health educator where the health educator will delineate ways of personal goal setting (proximal and distal). A hypothetical plan setting will be shown to the participants. Use of flip-chart or

A lecture on goal-setting will be given by the health educator (this will have elements of proximal goal setting -statements such as- I’ll try to use condoms every time I have sexual intercourse in the next 3 months or I’ll be having just

5 mins (lecture by health educator)

5 mins. (Brief talk and small group discussion)

Self-Control or Goal Setting
Setting goals and developing plans to accomplish chosen behaviors.
blackboard will be made to explain this. Small group discussion also will be used by the health educator.

one sexual partner in next 6 months and distal goals such as I’ll make sure that me or my partner engage in safer sex behaviors to prevent getting any sexually transmitted disease). Students will discuss the goals they would like to set for themselves in a small group and write them down on a sheet of paper.

| Total | 30 mins |

* SCT= Social Cognitive Theory
Session details for the non-theory (knowledge-based) group (SEE APPENDIXK)

Table C2

**Session 1. Introduction to HIV/AIDS and knowledge about HIV virus**

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
</tr>
</thead>
</table>
| 1                  | • Introduction  
• Discuss the origins of HIV virus  
• Discuss the prevalence of HIV/AIDS  
• Discuss structure of HIV virus  
• Discuss virus replication and drug targets | • The health educator will use powerpoint presentation along with videos to assist in his informational talk.  
• The health educator will discuss the content additionally. | Structure of the virus video (2 mins 35 secs).  
HIV replication video (2 mins 30 sec).  
HIV natural history video( 5 mins 30 sec)  
HIV/AIDS myths video( 8 mins 35 secs)  
Information talk and discussion- 12 mins |
| 2 & 3               | • Introduce the natural history and stages of HIV/AIDS.  
• Discuss myths related to HIV/AIDS | | |
| **Total**          | | **30 mins** | |
### Session 2: HIV/AIDS and Sexually transmitted diseases

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Discuss the symptoms of HIV/AIDS</td>
<td>• The health educator will use powerpoint presentation along with videos to assist in his informational talk.</td>
<td>HIV/AIDS clinical features video and discussion (5 min)</td>
</tr>
<tr>
<td>2</td>
<td>• Discuss the symptoms of sexually transmitted diseases (such as Chlamydia/gonorrhea/syphilis/herpes)</td>
<td>• The health educator will discuss the content additionally.</td>
<td>Informational talk and discussion about sexually transmitted diseases-assisted by powerpoint slides (20 mins)</td>
</tr>
<tr>
<td>3</td>
<td>• Discuss treatment of sexually transmitted diseases (such as Chlamydia/gonorrhea/syphilis/herpes)</td>
<td></td>
<td>Informational talk and discussion about treatment of sexually transmitted diseases (5 mins)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>30 mins</strong></td>
</tr>
</tbody>
</table>

- The health educator will use powerpoint presentation along with videos to assist in his informational talk.
- The health educator will discuss the content additionally.

**Total:** 30 mins
### Session 3  Epidemiological relationship and condom usage

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Discuss biological relationship between HIV/AIDS and sexually transmitted diseases</td>
<td>• The health educator will use powerpoint presentation along with videos to assist in his informational talk.</td>
<td>Information talk and discussion (along with powerpoint slides-) 18 mins.</td>
</tr>
<tr>
<td>2</td>
<td>• Discuss about epidemiological models in risk reduction</td>
<td>• The health educator will discuss the content additionally.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>• Discuss about condom usage as a risk reduction technique</td>
<td></td>
<td>Why use a condom (8 mins).</td>
</tr>
<tr>
<td>4</td>
<td>• Discuss about disadvantages and problems with condom usage</td>
<td></td>
<td>Communication on condom usage (4 mins).</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>30 mins</strong></td>
</tr>
</tbody>
</table>
**Session 4  Behavioral interventions for risk reduction**

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVE</th>
<th>CONTENT</th>
<th>LEARNING PROCESS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Discuss about interventions for risk reduction such as community, counseling and group interventions.</td>
<td>• The health educator will use powerpoint presentation along with videos to assist in his informational talk.</td>
<td>Informational talk and discussion on counseling, group and community interventions- assisted by powerpoint slides( 12 mins)</td>
</tr>
<tr>
<td>2</td>
<td>• Discuss about ‘sexual networks’ and ‘core group’ concept.</td>
<td>• The health educator will discuss the content additionally.</td>
<td>Informational talk and discussion on ‘sexual networks’ and ‘core group’ concept- assisted by powerpoint slides( 8 mins)</td>
</tr>
<tr>
<td>3</td>
<td>• Discuss importance and examples of ‘structural interventions’.</td>
<td></td>
<td>Informational talk and discussion on ‘structural interventions’ and some examples- assisted by powerpoint slides (10 mins).</td>
</tr>
</tbody>
</table>

**Total**                                                                                       **30 mins**
APPENDIX D

HIV/AIDS and Sexually Transmitted Diseases
Introduction

- HIV/AIDS
- More than 50% of all new HIV infections in the U.S. occur in young people under 25.
- 75% of people with AIDS were infected through heterosexual sex.
- On U.S. college campuses at least one in 250 students is HIV positive.
Spread

• Transmission
  - Sex
    • Vaginal/penile
    • Anal
    • Oral
  - Blood exposure
  - Mother to baby
Sexually transmitted infections

- Gonorrhea/Chlamydiae
- Syphilis
- Genital warts
- Scabies
- Genital Herpes
STD/STI prevention

- Abstinence
- Barrier Methods
  - Latex & polyurethane condoms
  - Female condoms
  - Dental dams (latex shields)
- Partner communication & selection
- Mutual testing and monogamy
Video

- This is a video link

http://www.youtube.com/watch?v=ce0Lx5b3B6g
Appendix E
Male condom fact sheet

The most effective way to prevent getting Sexually Transmitted Diseases (STDs) including HIV (the virus that causes AIDS) is to not have sex. To lower your risk, both partners can get tested for STDs, including HIV, before having sex.

If you do have sex with a partner whose disease status is unknown or who is infected with HIV or another STD, using latex condoms properly can help protect you. Talk to your partner about using condoms to avoid STDs. Using condoms does not mean you do not trust each other.

The Right Way to Use a Condom:

- Use a lubricated latex condom. Natural or "animal skin" condoms are not recommended for STD/HIV prevention.

- Use a new condom with each act of sexual intercourse.

- Carefully open the package and remove the condom. Carefully handle the condom to avoid damaging it with fingernails, teeth, or other sharp objects such as jewelry.

- Put the condom on after the penis is erect and before any genital, oral, or rectal contact with your partner.

- Make sure that no air is trapped in the tip of the condom. Hold the condom by the tip to squeeze out the air. Leave some space at the tip to hold the semen (cum).

- Make sure there is enough lubrication during intercourse, possibly by using water-based lubricants.

- Use only water-based lubricants such as K-Y Jelly, Astroglide, AquaLube, or glycerin with latex condoms. Oil-based lubricants such as petroleum jelly, shortening, mineral oil, massage oils, body lotions, or cooking oil can weaken latex.

- Whether condoms lubricated with spermicides such as Nonoxynol-9 are more effective than other lubricated condoms in protecting against HIV and other STDs is not known.

- After ejaculation (coming), hold the condom firmly against the base of the penis and pull out slowly while the penis is still hard. This will prevent the condom from slipping.

CONDOMS WORK IF YOU USE THEM THE RIGHT WAY EVERY TIME.
The most effective way to prevent getting Sexually Transmitted Diseases (STDs) including HIV (the virus that causes AIDS) is to not have sex. To lower your risk, both partners can get tested for STDs, including HIV, before having sex.

If you do have sex with a partner whose disease status is unknown or who is infected with HIV or another STD, **using polyurethane female condoms properly can help protect you.** Talk to your partner about using condoms to avoid STDs. Using condoms does not mean you do not trust each other.

**The Right Way to Use a Condom:**

- The female condom acts like a barrier. It is a soft, thin but strong sheath that sticks to the inside of the vagina. It has a soft flexible ring at each end. The ring at the closed end helps to put the condom inside and hold it in place. The open end stays outside the body and helps to protect the outside of the vagina.

  - The female condom is lubricated. Extra lubricant can be added for ease of movement and for extra pleasure.
  - The female condom should **not be used with a latex male condom** since the female condom may be moved out of position.
  - The female condom **does not contain a spermicide.** Spermicides like Nonoxynol-9 can be used.
  - Whether condoms lubricated with spermicides such as Nonoxynol-9 are more effective than other lubricated condoms in protecting against HIV and other STDs is not known.
  - Use a new condom with each act of sexual intercourse; the female condom is for one-time use.
  - Carefully open the package and remove the condom. Carefully handle the condom to avoid damaging it with fingernails, teeth, or other sharp objects such as jewelry.
  - The condom can be inserted up to **eight hours before sex.** Most women insert the female condom between 2-20 minutes beforehand.
  - To insert the condom, squeeze the inner ring and push it up into the vagina as far as it will go. When both partners are ready, guide the penis into the female condom. The female condom allows for free movement during sex.
  - The condom **should be removed after sex and before standing up.** It can be removed up to eight hours after use.

**Condoms Work If You Use Them The Right Way Every Time.**

Reference: Maryland Department of Health & Mental Hygiene
Office of Epidemiology and Disease Control Programs
VIDEO ABOUT APPROPRIATE USAGE OF CONDOMS (CULTURE-CENTRIC-AFRICAN-AMERICAN ACTORS)
SEE THE VIDEO LINK BELOW:

http://www.youtube.com/watch?v=0wGRNj5dqm8&feature=related
Appendix F

Role Play Sheet

**SCENARIO 1- DIRECT COMMUNICATION STYLE**

The following scene takes place at female college student’s house. The male student happens to be her boyfriend and they started with a casual conversation to begin with. The following scene introduces a dialogue between them about condom usage.

Female student: ……Hi

Male student:…..Hi

Female student:….Hi (smiling with body movement)

Male student: Is there anyone home?

Female student:….I don’t think so…what are you asking that for?

Male student….Hmm…smiling

Female student:…Hmm…you sound…like.you wanna make love

Male student:…Umhuh..(with a pause and smile)

Female student: Hmm…(pause)…well…good, I am ok with it…but I’ll love you more if you use a condom.

Male student: ….You know what…I don’t like anyone in our midst ….especially a condom…it sounds as if a third person is interfering….

Male student: …Would you like someone else messing around with us?

Female student: Oh!...But dear condom is like a raincoat……you know what I mean....

Male student : What the hell raincoat has to do with our sexual pleasure…? The weather seems perfectly fine for me.....

Female student: Oh! You still didn’t get it….We can enjoy the rain of sexual intimacy , without getting wet…that’s the beauty of using condoms.

Male student: …Umm…seems like I am getting what you say.....

Female student :…Aha. Aha….so you are ok with it....
Male student:....Ok….let’s give it a try....

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SCENARIO 2- INDIRECT COMMUNICATION STYLE

Male student:.....Hi
Female student:....Hi (smiling with body movement)
Male student: How are you today?
Female student: Good…what’s up? you are asking my health…?
Male student: Ya…you know I am concerned…..
Female student: Ummhmm… (pause and smiles)…
Male student: So you are all alone…?
Female student: Yes…my parents are out to meet relatives.
Male student: Great! ….so we have all evening to ourselves.
Female student: Yes darling…its just you and me…..
Male student: So…what are you thinking about….?..
Female student: You know what.... (pause and smile)
Male student: Sure!...anytime for you… (and smiles)
Female student: Hmm….I know….
Male student: I did like to take some precaution…what say….?
Female student: Don’t you trust me?...(looking alarmed)…
Male student: Oh..no..no..not that... (says defensively)…..I just want to play safe
Female student: What’s that for…! We know each other for months now..! don’t we?
Male student: Its not about knowing…I had other friends too…you know…I will like it safe every time…
Female student: But I am on pills…that should help a great deal…

Male student : Oh..good..but it won’t be much help…we should give it a try…what do you say…?

Female student: Ok…we can try that…

(The student’s make a mutual decision to use condoms).

**SCENARIO 3- ‘SUGGESTIVE’ COMMUNICATION STYLE**

Male student: Hey…seeing you after a long time…

Female student: Hi…we met last weekend. I think?

Male student: Oh! Yes…but still it’s a long wait for me dear…I missed you…

Female student: Hmm…me too..

Male student: So…what do you say. tonight…let’s relax and enjoy…

Female student: ..sounds good…

Male student: Great! So how was your week? Were you busy?...didn’t see too much of you…

Female student: Oh! It was crazy…you know my friend…Ms…J….?

Male student: Yes ….what about her?

Female student: She did some survey among students..and found out that more than half-of-them; don’t use condoms when having sex ..( alarming tone)....

Male student: What’s so surprising…many of my friend’s don’t and even I don’t at times…

Female student: You know ….what she said was…that using them protects against catching sexually transmitted diseases and HIV infection too…

Male student: Oh ! really…I didn’t think of that…

Female student: Yes…does that make sense…?

Male student : Oh man! ….it surely does…

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Appendix G

Knowledge group presentation (Nelson, & Williams, 2007)

Introduction to HIV/AIDS and knowledge about HIV virus

Session 1
(30 minutes duration)
Introduction

- The AIDS epidemic was first recognized in the United States in 1980-81 among men who have sex with men (MSM).
- The disease was recognized originally among people suffering from Pneumocystis carinii Pneumonia and Kaposi’s sarcoma.
- Disease patterns seen in injection drug users, transfusion recipients and persons with hemophilia.
Introduction

- The probable origin of HIV-1 was from Pan troglodytes (chimpanzees) in West and Central Africa, which was transmitted to humans during hunting for "bush meat".
- Another HIV-2 was discovered subsequently in African Green monkeys in the wild in West Africa.
Introduction

- Humans can be infected either by HIV 1 or HIV 2 and both can cause immunodeficiency and AIDS although the virulence of HIV-2 is considerably less than HIV-1.
- AIDS has become a global pandemic of extraordinary importance.
Introduction

- The disease is most frequent in sub-Saharan Africa, where the population prevalence among adults is estimated to be over 7%.
- The prevalence among adults worldwide is estimated by WHO to be 1.1%.
- AIDS decreases life expectancy of its victims by 20 or more years.
HIV virus

- [http://www.youtube.com/watch?v=v5LGqj-8eZq&feature=related](http://www.youtube.com/watch?v=v5LGqj-8eZq&feature=related) (Video about structure of HIV virus and how it enters cell)

- [http://www.youtube.com/watch?v=rqDkYJn7w9Y&feature=related](http://www.youtube.com/watch?v=rqDkYJn7w9Y&feature=related) (Video about HIV lifecycle and replication)
HIV virus

- HIV has a high replication rate with approximately 10 billion viral particles produced each day.
- The generation time of HIV averages 2.6 days and hence its calculated that 140 generations of HIV are produced each year in an infected patient.
HIV virus

- The viral genome is archived in some latently infected lymphocytes and macrophages so that HIV is not eradicable even with several years of HAART (Highly active anti-retroviral therapy).
- Due to this reservoir, the possibility of a permanent cure with currently available therapy is eliminated.
HIV virus

- There are several major targets of anti-HIV chemotherapy designed to interfere with viral replication.
- Several drugs have been developed to inhibit the reverse transcriptase enzyme.
- Another target is the protease enzyme used for viral assembly.
- The third drug target is attachment of virus to the CD4 cell receptor.
HIV Natural History

- The HIV virus is present in the blood after infection either by sexual contact or parenterally and viral RNA can be detected within 7-10 days.
- HIV antibodies appear in the blood about 7-21 days after the infection.
- Early in the infection, the viral load is usually very high.
HIV Natural History

- A 'viral set-point' is established in 3-4 months.
- This is predictive of the rate at which disease will progress.
- AIDS mortality among untreated persons with a viral load of 100,000 copies/ml averages about 4.5 years.
- Persons with lower set point survive more than 10 years.
HIV Natural History

- During acute stage (2-4 weeks) after infection an, “acute HIV infection syndrome” commonly occurs.
- The symptoms include fever (95%), adenopathy (75%), pharyngitis (70%), rash (70%) and other conditions such as meningitis, peripheral neuropathy and Bell’s palsy.
HIV natural history

- http://www.youtube.com/watch?v=D6XncLNNGQ0 (5 mins 30 secs)

- http://www.youtube.com/watch?v=LaVm3moZo_g (8 mins 55 secs)
HIV/AIDS and Sexually Transmitted Diseases

Session 2
(30 minutes duration)
HIV/AIDS Clinical Features

- [http://www.youtube.com/watch?v=68I7lVhuhY&feature=related](http://www.youtube.com/watch?v=68I7lVhuhY&feature=related) (3min 12 sec)
Gonorrhea/Chlamydia

- Very, very common all over the US and here in Cincinnati.
- Chlamydia is the most frequently reported STI in the US
- Symptoms are incredibly similar
- Often called “silent” diseases
- 80% of women and up to 50% of men show no symptoms
Gonorrhea/Chlamydia

- When men do show symptoms:
  - pus from the urethra and pain upon urination
- Women’s symptoms include
  - discharge, pain upon urination, lower abdominal pain, and bleeding between periods
- If symptoms do occur, they appear in one to three weeks
  - BUT, you’re infectious from the day you catch it.
Gonorrhea/Chlamydia

- Gonorrhea and Chlamydia are on the rise
- More than 650,000 cases of each disease are reported to the CDC each year
- Many don’t get treated or reported
- Estimated that three million people get these diseases each year
- By age 25, three out of four sexually active people will catch one of these diseases.
- Curable & easily treated
  - Antibiotics
Syphilis

Around for a long time
1800’s
Can only be spread through direct contact with a syphilis sore
Four stages of infection
Syphilis stages

- Primary State
  - 10-90 days for the first symptoms
  - A sore (or sores) called a chancre
  - Around for 3-6 weeks, then heals on its own
- Secondary Stage
  - Skin breaks into an itch-less rash
    - Sometimes so faint that it is not noticed
    - Sometimes accompanied by fever, swollen lymph glands, sore throat, headaches, muscle aches, and tiredness
- Syphilis is very contagious during the first two stages when symptoms are present
Syphilis stages (contd)

- Latent Stage
  - no symptoms, but syphilis is quietly damaging the body
  - attacks the internal organs
    - the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints.
- Fourth Stage
  - internal damage is severe and the person is about to die
  - marked by paralysis, numbness, blindness, and dementia
- Easily curable
  - Antibiotics
Genital warts

- Human Papillomavirus (HPV)
- Over 100 different strains
  - Over 30 of these are sexually transmitted
- 5.5 million Americans get new infections each year
- 10 of the 30 genital strains have been shown to occasionally lead to cervical cancer
HPV infections

- Most HPV infections have no symptoms (80%)
- Most infected people don’t know
- If symptoms:
  - bumps on the skin with a cauliflower-like top
  - look like the warts people get on their hands and feet
- Warts can take several months to appear
- No cure for HPV
  - Visible warts can be cut, frozen, or lasered off.
  - There is no guarantee all of the virus has been removed.
  - Another outbreak can emerge.
Genital Herpes

- The herpes simplex virus
- There are two types of the herpes simplex—type 1 and type 2.
- Type 1 used to be strictly cold sores; type 2 only genital.
  - Doctors are now finding both types in both places
- 20% of the adult population has genital herpes.
- It’s even more common in sexually active women and in African-Americans
Genital Herpes (contd)

- Type 1 produces only mild symptoms and genital infections of Type 1 are almost always caused by oral-genital contact.
- Type 2, however, can cause recurrent painful sores, particularly severe for people with compromised immune systems.
- Symptoms usually occur within two weeks of contracting the virus.
- The sores typically heal within two to four weeks.
Genital Herpes (contd)

- Most people can expect to have several (4-5) breakouts a year.
- They may become less recurrent after a few years.
- There is no cure for herpes
  - antiviral medications that can shorten and prevent outbreaks
  - Once you have the virus, you have it for life
Epidemiological relationship, and condom usage (Nelson & Williams, 2007)

Session 3
(30 minutes duration)
Epidemiological Relationships

- Biological relationship - multiple factors
  1) Recruitment of target cells-STDs such as syphilis and chlamydia induce a lymphocytic response.
  2) STD’s also increase HIV receptors and hence facilitate infection.
  3) Potentiation of HIV replication- herpes simplex virus.
Epidemiological relationship

- Sexual transmission of HIV is associated with increased viral load in infected partner.
- STDS – exposure risk is determined by exposure to new sexual partners
- Reproductive rate equation
  \[ R_0 = BCD \]
Epidemiological models and control

B = transmission coefficient
C = turnover of partners
D = duration of infection
- transmission- barrier methods of contraception
  a) Latex and polyurathane condoms
  b) Female condoms
  c) Dental dams (latex shields).
Epidemiological models and control

- Partner turnover - number of partners one is exposed to.
- It increases the statistical risk of STD exposure as well as the number of exposure with each partner.
- Abstinence model - impractical
- Decreasing number of partners through risk reduction interventions, education and counseling.
- Quality of partners as important as quantity.
Epidemiological models and control

- Reducing duration of infection - Interventions include population-based screening programs, development of effective treatment guidelines based on population base data and partner notification.
- Partner management - challenging
- Accessing partners - Chlamydia and Gonorrhea
Condom use - reduce risk of sexual exposure

- Condom use promotion - USA and abroad.
- Condoms are effective when used correctly and consistently.
- HIV-discordant couples - consistent condom use - 7 fold decrease in HIV seroconversion.
- Effective in reducing risk of sexually transmitted disease.
Condom use- contd

- Increased condom use is influenced by the appreciation of perceived benefit, peer group social norms and specific instruction in condom use.
- Condom use promotion has not found to increase sexual activity in adolescents or result in earlier sexual debut.
- Latex condoms are the most effective against HIV virus.
Condom use (contd)

- Latex and synthetic condoms can also be used during anogenital and orogenital intercourse to prevent sexually transmitted diseases.
- Condoms provide some protection against sexually transmitted diseases transmitted through skin-to-skin contact (herpes simplex virus 2, human papilloma virus, syphilis and chancroid).
Condom use (contd)

- Some of the disadvantages of condom usage are a) sensitivity, b) spontaneity, c) problems with erection, d) embarrassment, e) coitus dependence, e) lack of cooperation and f) latex allergy.
- Condom effectiveness heavily depends on the skill level and experience of the user.
Condom use (contd)

- Common problems with condom usage that facilitates exposure to sexually transmitted infections are a) failure to use them with every act of intercourse, b) failure to use throughout intercourse, c) condom breakage, d) condom slippage e) poor withdrawal technique, f) incorrect placement on penis.
Condom use (contd)

- Water-based lubricants are the only recommended lubricant to be used with condoms.
- A prospective study among sero discordant couples- 0% of the HIV-negative partners became infected despite a cumulative 15,000 episodes of intercourse.
Condoms (contd)

- Studies-'always users' vs 'never users'
- Preventable fraction (proportionate reduction) of HIV infection with consistent condom use was about 80%
- Condoms may reduce HIV infection risk by 90%
- Some condom can be protective if not able to use 100% of time.
Condom usage contd.

http://www.youtube.com/watch?v=20pu879Pe9q&feature=related (8 mins) - Why use a condom

http://www.youtube.com/watch?v=ZMeHWl4f0AQ (3 mins) - Communication on condom usage
Behavioral interventions for risk reduction (Nelson & Williams, 2007)

Session 4
(30 minutes duration)
Behavioral interventions

- Counseling strategies (individual or small groups) which focus on skill-building for condom use and communication strategies to improve condom negotiation have been shown to be effective in risk reduction as well as decreasing recurrent STDs.
- Voluntary counseling and testing – individuals and primary and non-primary partners been effective in risk reduction
Behavioral interventions

- Randomized intervention to one of the three sessions: condoms skills, social influence and access to condoms-men assigned to condom skills group, rates of incident STDs were half that of control.
- There was no impact on recurrent STDs.
Behavioral interventions

- Recent summaries of intervention in STD and HIV prevention conclude that individual counseling strategies are effective but depend largely on the knowledge base of the counselor and the amount of time spent with the clients.
- The strategies are more effective for HIV infected individuals than those who are HIV negative but of high risk and for older than younger persons.
Behavioral interventions

- Group interventions have been widely evaluated.
- An intense three small group intervention with sessions lasting 3-4 hours with African-American and Hispanic women focused on susceptibility, skills development and commitment to change while control received standard STD counseling.
- Rates of reinfection with chlamydia and gonorrhea were significantly lower in intervention group compared to control over 12 months of follow-up.
Behavioral interventions

- Multisite randomized controlled trial – adults in USA from STD clinics and primary care settings-seven session small group risk reduction intervention on self-reported behavior and STD end point over a 12 month follow-up.
- There were significant increases in condom use and significant decreases in self-reported STD symptoms including incident gonorrhea among men.
Behavioral interventions

- Intensive interventions appear promising if targeted toward specific population.
- Few biological endpoints appear to be affected by these interventions.
- Cost-effectiveness of most programs have not been rigorously evaluated.
- Transforming these studies into sustainable prevention programs is a continuing issue.
Behavioral interventions

- Community-level interventions over the past decade established their effectiveness when rigorously conducted.
- “Popular-opinion leader” approach has proven to be effective in MSM, inner-city women, male sex workers and young gay men.
Behavioral interventions

- Community-oriented prevention programs have found teacher training and peer education, workplace programs and condom social marketing to be highly effective.
- Randomized controlled trial in a Royal Thai Army peer led HIV education intervention (2 years) or HIV counseling and testing.
- Cumulative STD infection was 85% lower in intervention arm as compared to control arm.
Behavioral interventions

- Some community-based interventions using information, education and communication have not proved to be beneficial for all population segments.
- Structural interventions: Changes in national policy that directly affect HIV risk behavior are considered to be the most effective approaches for HIV prevention.
Behavioral interventions

- Decriminalizing the possession of injection equipment allows injection drug users to carry their own injection equipment and thereby avoid being forced to use others needles.
- 100% Condom Campaign-Thailand-required use of condoms in brothel-based sex work-decline in STD rates in female sex workers and their clients
- ABC program-Uganda-program effective however essential components could not be quantified.
STD interventions

- Traditionally STD interventions have used partner notifications as a major tool in control programs.
- New approaches have utilized understanding the social networks meaning all individuals who are associated with syphilis patient in variety of everyday activities and not limited to sex partners.
STD interventions

- These approaches are successful in identifying additional infected persons.
- A sexual network is the interrelated sexual connections of a defined social group. In a dense sexual network, there are multiple pathways between sexual partners, leading to multiple sources for disease exposure.
Core groups

- The core groups are population subgroups that are disproportionately affected by STDs and endemic reservoirs of disease in a community.
- In developing countries core groups are long distance truck drivers and commercial sex workers while in US, there is often a link to drug use.
Structural Interventions

- Most HIV prevention interventions occur at an individual level.
- Need more staff time and reach a limited number of persons.
- Structural interventions change or influence the social, political, and economic environment in ways that help many people all at once.
- It includes programs that change legal environment eg- syringes sold over counter.
Structural Interventions

- Changing physical or normative environment within which they occur e.g. Thai brothels that require condom use.
- They can also include programs to reduce or abolish income inequality, racism which create vulnerability to HIV/AIDS.
- Structural interventions address issues unrelated to HIV.
- Social, political and economic realities greatly influence high-risk behavior.
Structural intervention

- Thailand and the Dominican Republic have instituted “100% condom” campaigns mandating that brothel owners enforce the use of condoms during all sex acts. These campaigns enlist the support of brothel owners and sex workers and, when possible, their customers. These programs have reduced HIV and STD transmission considerably by changing the immediate social context of sexual behaviors to reduce unprotected sex.
Structural Interventions

Most US states have laws that make it a crime to possess or distribute needles and many have laws that require a prescription to buy a needle and syringe. Consequently, IDUs often do not carry syringes for fear of police harassment or arrest. To address this on a legal level, the Connecticut legislature passed a partial repeal of needle prescription and drug paraphernalia laws. This resulted in dramatic reductions in needle sharing, and increases in pharmacy purchase of syringes by IDUs. Sharing dropped from 52% to 31% after the new laws, pharmacy purchase rose from 19% to 78%, and street purchase fell from 74% to 28%.
Appendix H

Initial instruments measuring degree of program fidelity at first round of face and content validation

Structured tally sheets for assessing degree of implementation of experimental intervention

Session # 1. HIV/AIDS and Safer sex behavior

Objective: To assess the degree of implementation of the first session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________  Name of the health educator: ________________________________

No ____________________ Item _____________________________ Check if performed

Did the health educator

1. Get response to the word “HIV” from the students

   Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

   Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

2. List student responses on the flip-chart or blackboard

   Item readable? _____ Yes _____ No  If No, Suggestion ________________________________
3. Build on student responses and explain the terms

4. Explain the term “HIV” and “AIDS”

5. Explain the term “STD”

6. Use power point presentation to explain the terms “HIV/AIDS” and “STDs”

7. Explain the transmission of HIV/AIDS.
8. Explain types, symptoms of some of the sexually transmitted diseases?

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

9. Explain various prevention techniques to prevent HIV/AIDS and STDs

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

10. Show the HIV/STD information and prevention video

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

11. Show a culture-centric video (using African-American actors, hip-hop music etc)

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

12. Get response to the word “safer sex”

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________
13. Write student responses on a flip-chart or a blackboard

Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

14. Evaluate or judge student responses

Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

15. Ask students to mention some of common sexually transmitted diseases

Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

16. List the sexually transmitted diseases on a flip-chart or a blackboard.

Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

17. Ask students to ‘brainstorm’ safer sex behaviors

Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________
18. Acknowledge the explanations given by students about safer sex behaviors ______

   *Item readable?* _____ Yes _____ No   *If No, Suggestion*

   *Item face valid?* _____ Yes _____ No   *If No, Suggestion*

19. Debrief the students and rectify misconceptions about safer sex behaviors ______

   *Item readable?* _____ Yes _____ No   *If No, Suggestion*

   *Item face valid?* _____ Yes _____ No   *If No, Suggestion*

20. Spend about 20 mins. for the brainstorming session and reflect on student responses ______

   *Item readable?* _____ Yes _____ No   *If No, Suggestion*

   *Item face valid?* _____ Yes _____ No   *If No, Suggestion*

*IS THIS STRUCTURED TALLY SHEET CONTENT VALID?*

_______ Yes _________ No   *If No, Suggestion*
Session # 2:  Condom use information and skill building by practice

Objective: To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________  Name of the health educator: _______________________________________

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>1. Use the ‘demonstration technique’ as a health education tool</td>
<td></td>
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<tr>
<td>Item readable? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
</tr>
<tr>
<td>Item face valid? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
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<tr>
<td>2. Use the ‘demonstration’ for 10 minutes approx.</td>
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<tr>
<td>Item readable? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
</tr>
<tr>
<td>Item face valid? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
</tr>
<tr>
<td>3. Show correct method of opening the condom packet</td>
<td></td>
</tr>
<tr>
<td>Item readable? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
</tr>
<tr>
<td>Item face valid? _____ Yes _____ No  If No, Suggestion __________________</td>
<td></td>
</tr>
</tbody>
</table>
4. Show correct usage of condoms (side use, rolling, and space at end) ______________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

5. Explain the importance of correct technique of opening the packet and unfolding of condom __________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

6. Reemphasize the importance of correct ways of using condoms ______________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

7. Use a male and a female participant for an example demonstration technique ___________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

8. Use approx. 5 minutes for example demonstration by participants’ ______________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

9. Provide a male condom factsheet to all the participants ______________

Item readable? _____ Yes _____ No   If No, Suggestion ________________________________
10. Provide a female condom factsheet to all the participants

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

11. Highlight important points in the fact sheet by reading aloud

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

12. Use about 5 minutes for fact sheet distribution and highlighting the points

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

13. Show a penile-model condom use demonstration

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________

14. Use about 3 minutes to perform the demonstration

Item readable? _____ Yes _____ No  If No, Suggestion ____________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________
15. Use about 5 minutes for participant demonstration

*Item readable? _____ Yes _____ No    If No, Suggestion ________________________________*

*Item face valid? _____ Yes _____ No    If No, Suggestion ________________________________*

16. Show a condom usage video

*Item readable? _____ Yes _____ No    If No, Suggestion ________________________________*

*Item face valid? _____ Yes _____ No    If No, Suggestion ________________________________*

17. Use a culture-centric video (African-American actors/role models)

*Item readable? _____ Yes _____ No    If No, Suggestion ________________________________*

*Item face valid? _____ Yes _____ No    If No, Suggestion ________________________________*

18. Use a 2 minute video

*Item readable? _____ Yes _____ No    If No, Suggestion ________________________________*

*Item face valid? _____ Yes _____ No    If No, Suggestion ________________________________*

*IS THIS STRUCTURED TALLY SHEET CONTENT VALID?*

_________ Yes _______ No    If No, Suggestion ________________________________
**Session # 3.** Discussion on personal barriers to condom usage and communication skills building

**Objective:** To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

<table>
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<tr>
<td></td>
<td>Did the health educator ............</td>
<td></td>
</tr>
</tbody>
</table>

1. Ask the participants to come out with 3 barriers they face while using condoms

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

2. Put the list of these barriers on a flip-chart or a blackboard

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

3. Debrief the students on their responses about barriers faced

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________
4. Provide and informational talk about common barriers faced by students

*Item readable? _____ Yes _____ No  If No, Suggestion _______________________________

*Item face valid? _____ Yes _____ No  If No, Suggestion _______________________________

5. Use about 5 minutes for getting and listing the barriers

*Item readable? _____ Yes _____ No  If No, Suggestion _______________________________

*Item face valid? _____ Yes _____ No  If No, Suggestion _______________________________

6. Use about 5 minutes for debriefing and informational talk

*Item readable? _____ Yes _____ No  If No, Suggestion _______________________________

*Item face valid? _____ Yes _____ No  If No, Suggestion _______________________________

7. Provide an informational talk about 3 communication styles for introducing condoms

*Item readable? _____ Yes _____ No  If No, Suggestion _______________________________

*Item face valid? _____ Yes _____ No  If No, Suggestion _______________________________

8. Use approx. 5 minutes to complete this informational talk

*Item readable? _____ Yes _____ No  If No, Suggestion _______________________________

*Item face valid? _____ Yes _____ No  If No, Suggestion _______________________________
9. Divide participants into about 5 groups  

  
  Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

  Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

10. Provide and distribute scripts about condom use role-play  

  
  Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

  Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

11. Explain and instruct the participants on how to perform role-play  

  
  Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

  Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

12. Make two students from each group (male and a female) perform role-playing  

  
  Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

  Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

13. Use three different scripts to indicate three communicating styles  

  
  Item readable? _____ Yes _____ No  If No, Suggestion ________________________________

  Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________
14. Use about 12 minutes to complete the role-play sessions

   *Item readable? _____ Yes _____ No   If No, Suggestion ________________________________*

   *Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________*

15. Use scripts which mimicked real-life scenarios

   *Item readable? _____ Yes _____ No   If No, Suggestion ________________________________*

   *Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________*

*IS THIS STRUCTURED TALLY SHEET CONTENT VALID?*

   __________ Yes ________ No   If No, Suggestion ________________________________
Session # 4. Rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior

Objectives: To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________  Name of the health educator: _________________________________

No ___________________ Item __________________________________ Check if performed

Did the health educator ………..

1. Divide the participants into approx. 5 groups

   Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________

2. Use “brainstorming” to guide participants in coming out with their perceptions of prevailing norms about condom usage and having sexual partners

   Item readable? _____ Yes _____ No   If No, Suggestion ________________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ________________________________
3. Ask the participants to write their points down on a sheet of paper

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

4. Build on the participant responses and summarized their thoughts

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

5. Debrief the participants about healthy social norms about safer sex

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

6. Ask the participants to list 3-4 outcomes they expected with safer sex behavior

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________

7. Ask the participants to highlight the most important outcome from each group

   Item readable? _____ Yes _____ No   If No, Suggestion ____________________________

   Item face valid? _____ Yes _____ No   If No, Suggestion ____________________________
8. Ask the participants (one representative) from each group to write it down on a sheet of paper

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

9. List all the outcomes on a flip-chart or a blackboard

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

10. Highlight the important outcomes by underlining them

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

11. Explain what is goal-setting

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

12. Give examples about proximal and distal goal setting

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________
13. Lecture for about 5 minutes on goal setting

   Item readable? _____Yes _____No   If No, Suggestion ________________________________

   Item face valid? _____Yes _____No   If No, Suggestion ________________________________

14. Conduct a ‘small group discussion’ among the participants

   Item readable? _____Yes _____No   If No, Suggestion ________________________________

   Item face valid? _____Yes _____No   If No, Suggestion ________________________________

15. Ask the participants to write their goals down on a sheet of paper

   Item readable? _____Yes _____No   If No, Suggestion ________________________________

   Item face valid? _____Yes _____No   If No, Suggestion ________________________________

IS THIS STRUCTURED TALLY SHEET CONTENT VALID?

   ________ Yes ________ No   If No, Suggestion ________________________________
Structured tally sheets for assessing degree of implementation of a knowledge-based intervention

**Session # 1.** Introduction to HIV/AIDS and knowledge about HIV virus

**Objective:** To assess the degree of implementation of the first session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________

Name of the health educator: _____________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
</table>

Did the health educator ...........

1. Introduce the HIV/AIDS epidemic

<table>
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<tr>
<th>Item readable?</th>
<th>Yes</th>
<th>No</th>
<th>If No, Suggestion</th>
</tr>
</thead>
</table>

2. Discuss the origins of HIV virus

<table>
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<tr>
<th>Item readable?</th>
<th>Yes</th>
<th>No</th>
<th>If No, Suggestion</th>
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</table>

3. Discuss the prevalence of HIV/AIDS

<table>
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<tr>
<th>Item readable?</th>
<th>Yes</th>
<th>No</th>
<th>If No, Suggestion</th>
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</table>

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4. Show the video about structure of HIV virus

Item readable? _____ Yes _____ No If No, Suggestion ________________________________
Item face valid? _____ Yes _____ No If No, Suggestion ________________________________

5. Show the video about HIV lifecycle and replication

Item readable? _____ Yes _____ No If No, Suggestion ________________________________
Item face valid? _____ Yes _____ No If No, Suggestion ________________________________

6. Discuss about HIV virus replication

Item readable? _____ Yes _____ No If No, Suggestion ________________________________
Item face valid? _____ Yes _____ No If No, Suggestion ________________________________

7. Discuss about drug targets in the HIV virus

Item readable? _____ Yes _____ No If No, Suggestion ________________________________
Item face valid? _____ Yes _____ No If No, Suggestion ________________________________

8. Introduce the natural history of the HIV virus

Item readable? _____ Yes _____ No If No, Suggestion ________________________________
Item face valid? _____ Yes _____ No If No, Suggestion ________________________________
9. Discuss the importance of viral set-point in HIV/AIDS

Item readable? _____Yes _____No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

10. Discuss stages in the natural history of HIV virus

Item readable? _____Yes _____No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

11. Showed the video about HIV/AIDS spread

Item readable? _____Yes _____No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

12. Showed the video about myths related to HIV/AIDS

Item readable? _____Yes _____No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

IS THIS STRUCTURED TALLY SHEET CONTENT VALID?

_________ Yes _________ No  If No, Suggestion ________________________________
**Session # 2.**  HIV/AIDS and sexually transmitted diseases

**Objective:** To assess the degree of implementation of the second session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

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<td></td>
<td>Did the health educator ..........</td>
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</tr>
<tr>
<td>1.</td>
<td>Show a video on symptoms of HIV /AIDS</td>
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<td></td>
<td><em>Item readable? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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<td><em>Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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<tr>
<td>2.</td>
<td>Discuss the symptoms of Gonorrhea and Chlamydia</td>
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<td><em>Item readable? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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<td><em>Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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<td>3.</td>
<td>Discuss the burden of Gonorrhea and Chlamydia infection</td>
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<td><em>Item readable? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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<td></td>
<td><em>Item face valid? _____ Yes _____ No  If No, Suggestion ____________________________</em></td>
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</tbody>
</table>
4. Discuss the stages of syphilitic infection

5. Discuss symptoms of human papilloma infection

6. Discuss the treatment of human papilloma infection

7. Discuss symptoms of herpes simplex virus infection

8. Discuss treatment for herpes simplex virus infection
IS THIS STRUCTURED TALLY SHEET CONTENT VALID?

_______ Yes ________ No  If No, Suggestion ____________________________________________

.
**Session # 3.** Epidemiological relationship and condom usage

**Objective:** To assess the degree of implementation of the third session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________

Name of the health educator: _____________________________________

No _________________________ Item _____________________________ Check if performed

Did the health educator …………..

1. Discuss the biological relationship between HIV and Sexually transmitted diseases _________

   *Item readable? ______ No  If No, Suggestion ________________________________*

   *Item face valid? ______ No  If No, Suggestion ________________________________*

2. Discuss the epidemiological model for HIV/AIDS and sexually transmitted disease prevention _________

   *Item readable? ___ ___ No  If No, Suggestion ________________________________*

   *Item face valid? ___ ___ No  If No, Suggestion ________________________________*

3. Discuss about partner reduction and abstinence model _________

   *Item readable? ____Yes ____ No  If No, Suggestion ________________________________*

   *Item face valid? ____Yes ____ No  If No, Suggestion ________________________________*
4. Give an overview on condom usage

Item readable? _______ No  If No, Suggestion __________________________________________

Item face valid? _______ No  If No, Suggestion __________________________________________

5. Discuss condom usage as risk reduction technique

Item readable? _____Yes _____ No  If No, Suggestion __________________________________________

Item face valid? _____Yes _____ No  If No, Suggestion __________________________________________

6. Discuss about disadvantages of condom usage as risk reduction technique

Item readable? _____Yes _____ No  If No, Suggestion __________________________________________

Item face valid? _____Yes _____ No  If No, Suggestion __________________________________________

7. Discuss about common problems with condom usage as risk reduction technique

Item readable? _____Yes _____ No  If No, Suggestion __________________________________________

Item face valid? _____Yes _____ No  If No, Suggestion __________________________________________

8. Discuss studies related to condom usage as risk reduction technique

Item readable? _____Yes _____ No  If No, Suggestion __________________________________________

Item face valid? _____Yes _____ No  If No, Suggestion __________________________________________
9. Showed a video about reasons for using a condom

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

9. Showed a video about communication related to condom usage

Item readable? ______ Yes _____ No  If No, Suggestion ________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

IS THIS STRUCTURED TALLY SHEET CONTENT VALID?

_______ Yes ________ No  If No, Suggestion ________________________________
**Session # 4.** Behavioral interventions for risk reduction

**Objective:** To assess the degree of implementation of the fourth session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________  Name of the health educator: ________________________________

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<tbody>
<tr>
<td></td>
<td>Did the health educator ………….</td>
<td></td>
</tr>
</tbody>
</table>

1. Discuss about counseling interventions for risk reduction

   *Item readable? Yes No If No, Suggestion* ____________________________

2. Discuss about group interventions for risk reduction

   *Item readable? Yes No If No, Suggestion* ____________________________

3. Discuss about community level interventions

   *Item readable? Yes No If No, Suggestion* ____________________________
4. Discuss about partner notification as sexually transmitted disease risk reduction

Item readable? _____ Yes _____ No  If No, Suggestion ______________________________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ______________________________________________________

5. Discuss about sexual networks

Item readable? _____ Yes _____ No  If No, Suggestion ______________________________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ______________________________________________________

6. Discuss the concept of ‘core groups’

Item readable? _____ Yes _____ No  If No, Suggestion ______________________________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ______________________________________________________

7. Discuss ‘structural interventions’ in risk reduction -overview

Item readable? _____ Yes _____ No  If No, Suggestion ______________________________________________________

Item face valid? _____ Yes _____ No  If No, Suggestion ______________________________________________________

8. Discuss importance of ‘structural interventions’ in HIV/STD risk reduction

Item readable? _____________ No  If No, Suggestion ______________________________________________________

Item face valid? ________ No  If No, Suggestion ______________________________________________________

9. Discuss examples of ‘structural interventions’

Item readable? _____ Yes _____ No  If No, Suggestion ______________________________________________________

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Item face valid? _____ Yes _____ No  If No, Suggestion ________________________________

IS THIS STRUCTURED TALLY SHEET CONTENT VALID?

_________ Yes _________ No  If No, Suggestion ________________________________
Appendix- I

Final tally sheets experimental (theory-based) intervention-

Structured tally sheets for assessing degree of implementation of experimental intervention (final instruments)

Session # 1. HIV/AIDS and Safer sex behavior

Objective: To assess the degree of implementation of the first session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

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<tbody>
<tr>
<td>1</td>
<td>Did the health educator Get definitions to “HIV” and “STD” from the students</td>
<td>____________</td>
</tr>
<tr>
<td>2</td>
<td>Did the health educator List student responses on the flip-chart or blackboard</td>
<td>____________</td>
</tr>
<tr>
<td>3</td>
<td>Did the health educator Build on student responses and explain the terms</td>
<td>____________</td>
</tr>
<tr>
<td>4</td>
<td>Did the health educator Show the HIV/STD information and prevention video</td>
<td>____________</td>
</tr>
<tr>
<td>5</td>
<td>Did the health educator Introduced the term “safer sex” and asks what it meant for them?</td>
<td>____________</td>
</tr>
<tr>
<td>6</td>
<td>Did the health educator Write student responses on a flip-chart or a blackboard</td>
<td>____________</td>
</tr>
</tbody>
</table>
7. Ask students to mention some of common sexually transmitted diseases

8. List the sexually transmitted diseases on a flip-chart or a blackboard.

9. Debrief the students and rectify misconceptions about safer sex behaviors

**Session # 2 .** Condom use information and skill building by practice

**Objective:** To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________

Name of the health educator: _____________________________________

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</tr>
<tr>
<td>2</td>
<td>Show correct method of opening the condom packet</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Show correct usage of condoms (side use, rolling, and space at end)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Explain the importance of correct technique of opening the packet and unfolding of condom</td>
<td></td>
</tr>
</tbody>
</table>
5. Reemphasize the importance of correct ways of using condoms

6. Provide a male condom factsheet to all the participants’

7. Provide a female condom factsheet to all the participants’

8. Highlight important points in the fact sheet by reading aloud

9. Show a penile-model condom use demonstration

10. Show a condom usage video

11. Use a culture-centric video (African-American actors/role models)

Session #3. Discussion on personal barriers to condom usage and communication skills building

Objective: To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did the health educator ………...</td>
<td></td>
</tr>
</tbody>
</table>

1. Ask the participants to come out with 3 barriers they face while using condoms
2. Put the list of these barriers on a flip-chart or a blackboard __________
3. Debrief the students on their responses about barriers faced __________
4. Provide and informational talk about common barriers faced by students __________
5. Provide an informational talk about 3 communication styles for introducing condoms __________
6. Provide and distribute scripts about condom use role-play __________
7. Explain and instruct the participants on how to perform role-play __________
8. Use three different scripts to indicate three communicating styles __________
9. Use scripts which mimicked real-life scenarios __________

Session # 4. Rectifying misperceptions, setting personal goals and discussion of varying outcomes of the behavior

Objective: To assess the degree of implementation of the second session of the experimental intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

No Item Check if performed

Did the health educator ..........
1. Use “brainstorming” to guide participants in coming out with their perceptions of prevailing norms about condom usage and having sexual partners

2. Ask the participants to write their points down on a sheet of paper

3. Debrief the participants about healthy social norms about safer sex

4. Ask the participants to list 3-4 outcomes they expected with safer sex behavior

5. Ask the participants to highlight the most important outcome

6. Ask the participants (one representative) from each group to write down the most important outcome on a sheet of paper

7. List all the outcomes on a flip-chart or a blackboard

8. Highlight the important outcomes by underlining them

9. Explain what is goal-setting

10. Give examples about proximal and distal objective setting

11. Conduct a ‘small group discussion’ among the participants

12. Ask the participants to write their objectives down on a sheet of paper
Appendix J

Final tally sheets for knowledge-based (non-theory) intervention

Structured tally sheets for assessing degree of implementation of a knowledge based intervention (non-theory-based)

**Session # 1.** Introduction to HIV/AIDS and knowledge about HIV virus

**Objective:** To assess the degree of implementation of the first session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduce the HIV/AIDS epidemic</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Discuss the origins of HIV virus</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Discuss the prevalence of HIV/AIDS</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Show the video about structure of HIV virus</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Show the video about HIV lifecycle and replication</td>
<td></td>
</tr>
</tbody>
</table>

277
6. Discuss about HIV virus replication

7. Discuss about drug targets in the HIV virus

8. Introduce the natural history of the HIV virus

9. Discuss the importance of viral set-point in HIV/AIDS

10. Discuss stages in the natural history of HIV virus

11. Showed the video about HIV/AIDS spread

12. Showed the video about myths related to HIV/AIDS
**Session # 2.** HIV/AIDS and sexually transmitted diseases

**Objective:** To assess the degree of implementation of the second session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did the health educator ………….</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Show a video on symptoms of HIV /AIDS</td>
<td>________</td>
</tr>
<tr>
<td>2.</td>
<td>Discuss the symptoms of Gonorrhea and Chlamydia</td>
<td>________</td>
</tr>
<tr>
<td>3.</td>
<td>Discuss the burden of Gonorrhea and Chlamydia infection</td>
<td>________</td>
</tr>
<tr>
<td>4.</td>
<td>Discuss the stages of syphilitic infection</td>
<td>________</td>
</tr>
<tr>
<td>5.</td>
<td>Discuss symptoms of human papilloma infection</td>
<td>________</td>
</tr>
<tr>
<td>6.</td>
<td>Discuss the treatment of human papilloma infection</td>
<td>________</td>
</tr>
<tr>
<td>7.</td>
<td>Discuss symptoms of herpes simplex virus infection</td>
<td>________</td>
</tr>
<tr>
<td>8.</td>
<td>Discuss treatment for herpes simplex virus infection</td>
<td>________</td>
</tr>
</tbody>
</table>


**Session # 3.** Epidemiological relationship and condom usage

**Objective:** To assess the degree of implementation of the third session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: _____________________________________

Name of the health educator: ________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did the health educator …………</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Discuss the biological relationship between HIV and Sexually transmitted diseases</td>
<td>________</td>
</tr>
<tr>
<td>2.</td>
<td>Discuss the epidemiological model for HIV/AIDS and sexually transmitted disease prevention</td>
<td>________</td>
</tr>
<tr>
<td>3.</td>
<td>Discuss about partner reduction and abstinence model</td>
<td>________</td>
</tr>
<tr>
<td>4.</td>
<td>Give an overview on condom usage</td>
<td>________</td>
</tr>
<tr>
<td>5.</td>
<td>Discuss condom usage as risk reduction technique</td>
<td>________</td>
</tr>
<tr>
<td>6.</td>
<td>Discuss about disadvantages of condom usage as risk reduction technique</td>
<td>________</td>
</tr>
<tr>
<td>7.</td>
<td>Discuss about common problems with condom usage as risk reduction technique</td>
<td>________</td>
</tr>
<tr>
<td>8.</td>
<td>Discuss studies related to condom usage as risk reduction technique</td>
<td>________</td>
</tr>
</tbody>
</table>
9. Showed a video about reasons for using a condom

10. Showed a video about communication related to condom usage


**Session #4.** Behavioral interventions for risk reduction

**Objective:** To assess the degree of implementation of the fourth session of the knowledge based intervention with the help of two observers who observe the health educator implementing the session for consistency and discrepancy between the planned program and the program actually occurring through a structured tally sheet.

Name of the observer: ________________________________

Name of the health educator: ________________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Check if performed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did the health educator ..........</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Discuss about counseling interventions for risk reduction</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Discuss about group interventions for risk reduction</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Discuss about community level interventions</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Discuss about partner notification as sexually transmitted disease risk reduction</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Discuss about sexual networks</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Discuss the concept of ‘core groups’</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Discuss ‘structural interventions’ in risk reduction -overview</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Discuss importance of ‘structural interventions’ in HIV/STD risk reduction</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Discuss examples of ‘structural interventions’</td>
<td></td>
</tr>
</tbody>
</table>
Appendix K

Survey instrument for safer sex among college students

UNIVERSITY OF CINCINNATI IRB#

Survey Instrument for safer sex among college students

**Consent and Directions:** This survey is voluntary. You may choose not to participate without consequences. We hope you choose to answer all questions of the study. There is no direct benefit of this survey to you. All data from this survey will be kept confidential. Some of you may be asked to take this survey two times. Your participation in this survey implies your consent. For each item put an “X” mark by the response that correctly describes your view.

---------------------------------------------------------------------------------------------------------------------

Please write your birth month, followed by the birth-date, followed by last 4-digits of your UC ID Number (Write in numerals)

---------------------------------------------------------------------------------------------------------------------

1) Age:__________ (years)

---------------------------------------------------------------------------------------------------------------------

2) Gender: □ Male
              □ Female

---------------------------------------------------------------------------------------------------------------------

3) Year in school: □ Freshman
                         □ Sophomore
                         □ Junior
                         □ Senior
                         □ Graduate

---------------------------------------------------------------------------------------------------------------------

4) Cumulative GPA:_____________

---------------------------------------------------------------------------------------------------------------------

**Definition of sexual intercourse:** For our study sexual intercourse is defined as vaginal penetration by penis.

5) Have you ever had sexual intercourse?

              □ No  If no- you can stop. Thank you for your time.
              □ Yes  If yes- proceed to the remaining questions-

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6) Number of sexual partners in the past year: __________

7) Have you ever been diagnosed with a sexually transmitted disease?
   □ Yes
   □ No

8) Age at first sexual intercourse? ________ Years.

9) Have you ever taken a sexuality class in the past?
   □ Yes
   □ No

10) Are you presently taking a sexuality class?
    □ Yes
    □ No

11) During the past 30 days...

   □ Never
   □ Hardly ever
   □ Sometimes
   □ Almost Always
   □ Always

   a. When having sexual intercourse, how often do you use condoms?

12) How often do you roll the condom (unroll smoothly from rim on the outside) to put it on?

   □ Never
   □ Hardly ever
   □ Sometimes
   □ Almost Always
   □ Always

13) How often were you monogamous (had only one partner for sexual intercourse)?

   □ Never
   □ Hardly ever
   □ Sometimes
   □ Almost Always
   □ Always

14) Did you open the condom packet without any tears or damage to the condom?

   □ Never
   □ Hardly ever
   □ Sometimes
   □ Almost Always
   □ Always
15) …when putting on the condom, how often you kept space at the end?

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>Slightly confident</th>
<th>Moderately confident</th>
<th>Very confident</th>
<th>Completely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

16) I am confident that I can make sure a condom is used each time I engage in sexual intercourse.

17) I am confident that I can open the pack of condoms without tear or damage, each time I engage in sexual intercourse.

18) I am confident of insisting my partner to use condoms at all times I engage in sexual intercourse.

19) I am confident of keeping space at the end of the condom during use.

20) I am confident of being monogamous (having only one partner in a relationship).
<table>
<thead>
<tr>
<th>How confident are you of using condoms during sexual intercourse…</th>
<th>Not at all confident</th>
<th>Slightly confident</th>
<th>Moderately confident</th>
<th>Very confident</th>
<th>Completely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>21)…when you are in a hurry</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>22)…when your partner is uncomfortable using it.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>23)…when you are under the influence of alcohol.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>24) …when you feel it reduces sexual pleasure</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

25) Condom use will depend on condom being readily available.

□ Never □ Hardly ever □ Sometimes □ Almost always □ Always

26) Condom usage while engaging in sexual intercourse will depend on the place.

□ Never □ Hardly ever □ Sometimes □ Almost always □ Always

27) Condom usage while engaging in sexual intercourse will depend on partner type (stranger or an acquaintance or a boyfriend or a girlfriend).

□ Never □ Hardly ever □ Sometimes □ Almost always □ Always

28) Condom usage while engaging in sexual intercourse will depend on partner attractiveness (looks).

□ Never □ Hardly ever □ Sometimes □ Almost always □ Always
<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Hardly ever</th>
<th>Sometimes</th>
<th>Almost Always</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>If I use condoms during sexual intercourse at all times I will…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29)…be healthier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30)…feel protected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31)…worry less about catching any disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32)…be more confident about my sexual experiences.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not at all important</th>
<th>Slightly important</th>
<th>Moderately important</th>
<th>Very important</th>
<th>Extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important are using condoms all the time to…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33)…be healthier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34)…feel protected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35)…worry less about catching any disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36)…be more confident about my sexual experiences.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How sure are you that you can…

37) …plan that you use condoms every time you or your partner engages in sexual intercourse.
   □   □   □   □   □   □

38) …refrain from having sexual intercourse with multiple partners.
   □   □   □   □   □   □

39) …use condoms (after drinking alcohol)
   □   □   □   □   □   □

40) …refuse to have sexual intercourse when there is no condom available.
   □   □   □   □   □   □

THANK YOU!