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Sexually Transmitted Infection Risk Reduction for College Students

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ABSTRACT

SEXUALLY TRANSMITTED INFECTION RISK REDUCTION
FOR COLLEGE STUDENTS

University students have been assessed through many sexual health lenses, but there is a paucity of research on the sexual health of community college students. This population may provide good access to at-risk youth, and opportunity to reverse steep climbs in sexually transmitted infection (STI) rates. This research project pilot tests a theory-based intervention employing social facilitation to reduce STI risk among college students. Fifty students were recruited from Human Sexuality courses to participate in a 60-minute workshop. Pre- and post-testing measured for change in STI knowledge, attitude towards safer sex, and self-efficacy for engaging in safer sex practices.

A two-tailed paired t-test showed a significant increase in knowledge from pre-test to post-test ($t(49) = 5.43$, $p < 0.001$). Attitudes towards safer sex changed significantly between pre- and post-test on both subscales: advantages of safer sex ($t(47) = 3.21$, $p < 0.05$), and disadvantages of safer sex ($t(47) = 2.02$, $p < 0.05$). No significant change in self-efficacy scores was demonstrated between pre- and post-testing. Study replication with more time focused on self-regulation skill and ability may improve self-efficacy scores. The intervention could eventually be implemented on each of the 110 California Community College campuses, and adapted for use in other settings,

Mary Kathryn Dowling
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SEXUALLY TRANSMITTED INFECTION RISK REDUCTION

FOR COLLEGE STUDENTS

by

Mary Kathryn Dowling

A project

submitted in partial

fulfillment of the requirements for the degree of

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APPROVED

For the California State University, Northern Consortium
Doctor of Nursing Practice:

We, the undersigned, certify that the project of the following student
meets the required standards of scholarship, format, and style of the
university and the student's graduate degree program for the
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CHAPTER 1: INTRODUCTION

National rates for sexually transmitted infections (STI) have reached an all-time high (Centers for Disease Control, 2017). California STI rates have steadily climbed over the last six years, and the state now holds the dubious title of largest number of STI cases in the nation (California Department of Public Health, 2017). Youth age 15 to 24 are the highest risk group for contracting STIs (Centers for Disease Control, 2017). This age group represents nearly 25% of the sexually active population in the US, yet they contract half of the 20 million new STI cases each year.

Purpose

The purpose of this DNP project is to pilot test a theory based intervention aimed at reducing STI risk among college students.

Background and Significance

Our national bill for STI treatment is currently $16 billion per year (Centers for Disease Control, 2017). Rates of each of the reportable bacterial STIs (chlamydia, gonorrhea, syphilis) are increasing (Centers for Disease Control, 2017; California Department of Public Health, 2017). Chlamydia and gonorrhea rates increased by 4.7% and 18.5% respectively from 2015 to 2016 (Centers for Disease Control, 2017). National syphilis rates were flat for decades, approached zero in the 2000s, but have steadily climbed since 2009. The Centers for Disease Control (CDC, 2017) reported an alarming 17.6% nation-wide increase in syphilis from 2015 to 2016, with the majority of new cases occurring among men who have sex with men (MSM). Youth age 15 to 24 are the highest risk group for STIs

(CDC, 2017). Targeting this vulnerable age group may be an effective strategy in reversing the alarming trend of increasing STI rates.

Approximately 30% of Californians age 18-24 are enrolled in community college (California Community College Chancellor's Office, 2018). These students have fewer economic resources than 4 year students (California Community College Chancellor's Office, 2016), which likely places them at increased health risk. Many young college students are living away from home for the first time, and exploring their identity and sexuality. College is often thought of as an environment for learning and self-development, but college students are also known to experiment with risk taking behavior (Douglas et al., 1997). Casual sex, or hooking up, is a common behavior in this population, and can increase risk of contracting sexually transmitted infections (Helm, Gondra, McBride & Duane, 2015). California community college students take more sexual risks than the nation average for undergraduate students (Trieu, Bratton, & Marshak, 2011). An intervention aimed at community college students may be and effective strategy for addressing high STI rates among youth.

Theoretical Framework

The integrated theory of health behavior change (ITHBC) provides a logical framework to guide the development of an intervention aimed at reducing STI risk. Ryan (2009) developed this health promotion theory by reviewing ten years of published behavior change research and focusing in on concepts related to interventions resulting in statistically significant positive behavior change. The resulting theory weaves together pieces of "health behavior change, self-regulation theories, social support theory, and research related to self-management of chronic

illness" (p 165). Key concepts of ITHBC include knowledge and beliefs, social facilitation, and self-regulation skill and ability.

ITHBC assumes behavior change to be a process that is both dynamic and interactive (2009). A person must want change before health behavior change can happen. Social interactions may inspire motivation and support ongoing progress. Skill and ability to self-regulate may help us carry on through challenges and adapt our plans accordingly. Each of these factors influences our engagement in self-management behavior. If we stay engaged in this process of health behavior change, it eventually will result in improved health status.

Ryan (2009) states that knowledge alone is not enough to result in behavior change. Condition specific knowledge may inform us that changing our health habits related to that condition would be a good idea, but our personal perceptions are also important in determining behavior. We must perceive ourselves as at risk, and able to change. Smokers know that smoking is harmful to their health, but if they don't believe they are susceptible, that they can learn to control their smoking habits, or that life is worth living, they are unlikely to actively try to cut back or quit smoking. Social facilitation can influence people to see the value in behavior change, and provide support for continued work towards a behavioral health goal. A smoker with family and friends who want to see them succeed may be more motivated to stick with their quit plan. An intervention plan addressing each of these key elements could result in lasting behavior change and improved health.

Research Question

Can a STI intervention based on the ITHBC improve college students' STI prevention knowledge, attitudes regarding safe sex, and self-efficacy for engaging in safer sex behaviors?

CHAPTER 2: LITERATURE REVIEW

Recent literature regarding STIs in college students focuses on hookup behavior, exploring factors that may predict risk behavior, and interventions for reducing STI risk in this population.

Fielder, Walsh, Carey, and Carey (2013) conducted a prospective longitudinal study to determine if factors impacting sexual behavior could be identified and used to predict hookups in female college students. Hookup for this study was defined as "engaging in sexual interactions outside of committed relationships" (Fielder et al., 2013, p. 1425). Female college freshman, age 18 - 21 years, were recruited via mass email and psychology department outreach at an upstate New York private residential school. Participants were paid $20 for completing the baseline survey, and $10 for each follow up survey collected monthly throughout the school year. The 483 responders were primarily 18-year-old heterosexual women, 67% of them white. Orientation sessions were held in the first weeks of school. Enrollees later answered survey questions confidentially via computer. Items from several standardized tools such as the Impulsiveness-Monotony Avoidance Scale, the Rosenberg Self-Esteem Scale, and the Iowa-Netherlands Comparison Orientation Measure were used to collect baseline survey data to establish risk factors and protective factors. Alpha scores for these measures were reported as ranging from 0.78 to 0.91. One subset of items was noted as being normed using a college student population, and all instrument sources were referenced. Follow up surveys regarding hookup behavior followed guidelines that were published in an effort to address reliability and validity concerns regarding self-reported data.

Binomial regression was used to analyze the results. Tables for all study variables were presented including correlation coefficient and p values. Having a history of hookup behavior prior to college was the strongest predictor of engaging in hookups during the first year of college for these women. Frequent binge drinking and marijuana use, as well as hook-up intensions were also strong hookup predictors. Other significant risk factors identified in this study included "impulsivity, sensation seeking, . . . social comparison orientation, and situational triggers for hookups" (Fielder et al., 2013, p. 1425). Subjective religiosity and religious attendance were the strongest protective factors against hookups identified. Self-esteem and being in a committed relationship also demonstrated protective value. A strength of this study was the large sample size, helping make the case for generalizability to women at similar colleges. A limitation of this study was the lack of discussion of condom use or differentiation between repeat hookups with the same partner and hookups with multiple partners, limiting STI risk assessment.

Goldsberry, Moore, MacMillan, and Butler (2016) studied sexual health knowledge and attitudes among college fraternity and sorority members. They sought to test the efficacy of an "evidence-based educational intervention targeting STD knowledge and attitudes towards safe sex behaviors in Greek society college students" (p. 189). They designed a correlational study in which the principle researcher, a nurse practitioner, provided 30 minute sessions for campus fraternities and sororities. Baseline knowledge and attitude scores were measured and compared to post-test data collected a week after the intervention. Fraternities and sororities at a Southeastern 4-year college campus were invited to participate at a campus wide meeting of Greek organizations. Priori power analysis set the necessary sample size at 150. Though 262 students attended the sessions, only 132

participated in the study. The sample was primarily white (97.7%), female (86.4%), freshmen (40.2%) and sophomores (28%) who lived both on- and off-campus (42.4%, 51.5%). Forty-seven percent of study participants reported being single and all indicated that they were heterosexual.

Goldsberry et al. (2016) employed two instruments with reliability and validity established in published young adult research to measure knowledge and attitudes pre- and post-intervention: the STD Knowledge Questionnaire (Jawarski & Carrey, 2007) and STD Attitude Scale (Yarber, Torabi & Veenker, 1988). The authors created their own demographic survey and included alcohol intake, illicit drug use, and sexual history. Dependent samples t-tests were used to compare pre- and post-test knowledge and attitude scores. A significant ($p < 0.001$) knowledge increase in from a pre-test mean score of 13.03 to a post-test mean score of 20.27 (27 points possible) was noted. No significant change in mean attitude score from pre- to post-test was noted. This study was well designed and the research instruments thoughtfully chosen and described. The primary limitation of this study was its failure to recruit the target number of participants.

Another recent study evaluated the efficacy of an STI intervention with young college students. Lustria et al. (2016) hypothesized that tailored sexual health web content would increase perceived personal relevance, perceived STI risk, and motivate STI testing among college students more than non-tailored sexual health web content. Tailoring is a strategy used to customize messages to better engage an individual. The idea is that tailored messages capture more attention than a generic or targeted (for an at-risk group) message would. This health communication strategy begins with assessing individual factors such as beliefs, attitudes and behaviors and employs algorithms to guide the selection of tailored messages. Students were randomly assigned to the treatment or control

group after completion of the informed consent process. A pre-test was then administered, and the treatment group proceeded to tailored content guided by their responses, while the control group proceeded to standard content from the CDC website. All participants were encouraged, though not required, to travel around the website for at least 10 minutes, and reminded via popup message to complete the post-test when 10 minutes had elapsed.

The sample for this study consisted of 1065 sexually active college students, age 18 - 26 (average age 20) at a Southeastern US research university (Lustria et al., 2016). Participants were recruited from Fall 2012 and Spring 2013 classes via links on course web pages and direct emails. All students could earn extra credit for study participation and were offered free at-home STI testing at the completion of the intervention. Sample demographics were reported at 54% male, 46% female, more than 80% white, nearly 20% Hispanic, and approximately 50% in a relationship. There were no statistically significant differences in the demographic makeup of the treatment group of 527 and the control group of 538 students. Data was collected via computerized pre- and post-tests that incorporated a number of items borrowed from previous research. High reliability scores were reported for each subset (range $\alpha = 0.78 - 0.95$). Items measuring perceived risk were adapted from heart disease research. T-tests, chi-square, and ANCOVA were reported in data tables, line graphs, and a graphic structural equation model. Perceived STI risk and perceived personal relevance scores increased significantly for the group receiving tailored content, but not the control group. The tailoring group was also 1.5 times more likely to order the home testing kit than the control group upon completion of the intervention. This study is innovative in its use of technology to deliver custom sexual health messaging. Its randomized control design lends confidence in tailored messaging's ability to motivate sexual health

behavior change in college students. The value of this study is limited by its failure to address sexual orientation and same sex partners. There was no mention of participant sexual orientation, gender of partners, or tailored content that may be relevant to students who don't identify as heterosexual.

Kanekar, Sharma, and Bennett (2015) studied social cognitive theory as a model for predicting sexual behavior in college students. They wanted to know if the constructs of this theory could explain engagement in safer sex practices. Their cross-sectional study measured self-efficacy regarding safer sex, situational perceptions and self-control as independent variables and safer sexual behavior as the dependent variable. A convenience sample of 180 sexually active college students was recruited from various classrooms at a medium-sized Northeastern US university. Participants were awarded five dollar gift cards for completing a paper survey. The mean age for this sample was 20.80 (range 18-50), and 51% of participants were female, 49% male. More than 50% had taken a sexuality class and 5.6% were currently enrolled in a sexuality class. The survey instrument was a 43-item questionnaire with reliability and validity established in prior college STI research by same authors ($\alpha \geq 0.70$, factor loadings 0.40). Stepwise multiple regression analysis showed that self-efficacy towards safer sex, situational perceptions, and self-control (each with p values < 0.05) accounted for 48% of the variance in sexual behavior for this sample. Social cognitive theory was found to be useful in predicting sexual behavior for this population. The strength of these findings is somewhat limited by the use of convenience sampling potentially introducing bias, but it is valuable in its identification of predictors of safer sex behaviors. These findings can help inform public health and education efforts in STI prevention.

Turchik and Gidyez (2012) looked at the relationship between intention to engage in safe sex behavior and actual sexual behavior. In their prospective longitudinal study, they sought to determine if characteristics of student's last sexual encounter could predict whether or not students who had intended to engage in safer sex practices do so or not with both relationship and casual partners. This study was conducted at a mid-sized Midwestern US university. Undergraduate students were recruited from psychology classes and offered extra credit for either study participation or a written summary of an article. The sample included 453 students with fairly homogenous demographics. Participants varied from 18 to 21 years of age, 67% were female, 87% white, 76% Christian, and 97% heterosexual.

Intention to use condoms, birth control or a dual method approach; intention certainty; engagement in condom preparation behaviors; and recent condom use were measured at two time points 8 weeks apart using a questionnaire (Turchik & Gidyez, 2012). There was no discussion regarding the development or prior use of this instrument. Reliability scores of 0.82 to 0.98 were reported for intention item. Discriminant functional analysis using correlation coefficients were run to evaluate the relationship between intention and behavior. Engaging in safer sex practices after reporting the intention to do so was correctly predicted 74 to 92% of the time for the six protective behaviors. Wilks's lambda and p values were reported for each function. Intention stability, intention certainty, and engagement in condom preparatory behaviors were the best predictors of carrying out safe sex intentions. This study adds to the body of STI prevention knowledge by clarifying the relationship between intension to practice safe sex and actual behavior, as well as factors that may contribute to the success or failure of those

intensions. The generalizability of the research findings is limited by the homogeneous nature of the sample.

Vasilenko, Lefkowitz, and Maggs (2012) investigated positive and negative short-term consequences of sex for emerging adults. They noted the tendency of young adult sexual health research to focus on negatives such as STIs and unintended pregnancy, and sexual health research for older adults to focus on positive aspects such as fostering intimacy and boosting satisfaction with relationships. The aim was to explore both the positive and negative consequences of sexual activity for young adults as part of a larger longitudinal study regarding student life. A web-based survey was administered to a stratified random sample of 209 first year students at a large Northeastern US university. This sample was racially diverse (30% Hispanic, 30% African American, 22% Asian American, 35% European American), and 97% heterosexual. Participants were paid up to $75 per semester for completing the initial survey, and a daily survey for 14 days. A federal certificate of confidentiality was obtained.

Students reported at least one positive consequence for most sexual encounters, and negative consequences were reported less frequently (Vasilenko et al., 2012). Negative consequences were associated with lack of contraceptive use, and sex with a non-dating partner. Positive and negative intrapersonal and interpersonal consequences were grouped into empirically validated categories. Correlations between categories were evaluated. The most commonly reported positive intrapersonal consequence was feeling physically satisfied (81%). Fear of pregnancy was the most commonly reported negative intrapersonal consequence at 17%. The most common positive interpersonal consequence was feeling closer to partner (89%). The most common negative interpersonal consequence was worry that partner wants more commitment (7%). Logistic multilevel modeling showed

no gender difference in positive intrapersonal consequence, but male students had higher odds of worrying about health consequence, and 60% lower odds of sexual dissatisfaction. One strength of this study was that its stratified random sampling method, which produced a more ethnically diverse sample. A weakness is that the study design did not allow for assessment of the reliability of the research instrument.

Trieu, Marshak, & Bratton (2013) studied the sexual health behaviors of Asian Pacific Islander (API) community college students. Their survey-based correlation research attempted to isolate features associated with sexual behavior and contraceptive choices, and to explore the relationship between condom use and HIV testing for API students. Survey data for this study was taken from a consortium of 13 California Community Colleges who all administered the American College Health Association National College Health Assessment (ACHA-NCHA) to their students in 2007. The ACHA-NCHA is a nationally recognized survey of college students' health behaviors and perceptions. The authors did not discuss reliability and validity of the instrument in their article, but this information is published on the ACHA-NCHA survey website. Participants were randomly selected on all 13 campuses, 12 using paper surveys, and one campus electing to collect responses electronically. The consortium pooled their survey responses and compiled a consortium data set. Trieu et al. pulled a sample of 769 APIs from the nearly 8,000 California Community College students who participated in the 2007 survey. The API sample ranged in age from 18 – 24 (mean 20), 51.2% were female, all were heterosexual, and 67.1% were single.

API students had fewer sexual partners in the year prior to the survey than the larger consortium group, and had a strong preference for condoms as their contraceptive method (53.0% condoms, 29.3% hormonal method). APIs were less

likely to test for HIV than the full consortium sample, and API women were twice as likely to reported having tested for HIV than the men (33.3% and 16.8% respectively). Two chi-square correlations with a p value less than 0.001 were reported: relationship status, and condom use during last vaginal intercourse. Married participants were most likely to have been tested (56.3%), followed by those in a relationship (28.4%), and single API students (17.5%). Condoms were less likely to by those who had been HIV tested (38.7%) than those who had not been HIV tested (55%). The primary strength of this study is its use of a large randomized sample in a previously unexplored setting. One limitation of this study was its focus on a narrow, lower risk, subset of the emerging adult population. While the findings could help guide the provision of culturally appropriate sexual health for young APIs, it adds little to the knowledge base for combating the rising incidence of STIs in 15 to 24 year olds.

Research Gap

College STI research has primarily focused on four-year university students (Fielder et al., 2013; Goldsberry et al., 2015; Lustria et al., 2016; Kanekar, 2015; Kooyman et at., 2011; Turchick & Gidyez, 2012; Vasilenko et al., 2012). A search of multiple journal article databases yielded only one study of STI issues among community college students published within the last five years (Trieu et al, 2014). Much of the research is set on the east coast, with largely white samples. More research on the sexual health of community college students is needed. Conducting a study of community college students in California would begin to address gaps in the research. Efforts to increase the ethnic diversity of STI research samples should be made.

A number of recent studies have explored STI risk factors for this population (Fielder et al., 2013; Kanekar, 2015). The findings from these studies can help inform intervention development. Turchick & Gidyez's (2012) findings regarding safe sex intention and behavior suggests that condom preparation behaviors can increase condom use. Incorporating rehearsal of safe sex behaviors - such as having condoms available, and discussing their use ahead of time - could improve the efficacy of STI interventions for college students.

Tailored messaging delivered via technology (Lustria et al., 2016) is promising avenue for further intervention development and implementation, but perhaps beyond the scope of a DNP project. The interventional approach employed by Goldsberry et al. (2015) to improve STI prevention knowledge and attitude among college fraternity and sorority members warrants further research with other student groups. This study also presented standardized tools for measuring knowledge and attitude that could be useful for other research. Kanekar et al. (2015) demonstrated that the constructs of social cognitive theory can be used as predictors of sexual behavior. This suggests that social factors could be an important determinate in sexual decision making, and that social factors may be useful to consider in STI intervention development for college students. This literature review provides support for developing and implementing an STI intervention addressing social aspects of sexual health behaviors with California Community College students.

CHAPTER 3: METHODOLOGY

The ITHBC guided the development of a 60-minute educational intervention, presented as a workshop. This workshop addresses STI prevention knowledge and beliefs; social facilitation of safe sex strategies; and self-regulation skill and ability of community college students to engage in lower risk behaviors. Approval to conduct research with human subjects was obtained from Fresno State University's Institutional Review Board.

Research Design

A quasi-experimental pilot study design was employed for this research project.

Population and Sampling

This project was conducted at a California Community College of with a student population of nearly 13,000 students and a median age of 23. Convenience sampling was used to recruit students enrolled in each of the three sections of Human Sexuality offered at the college. Students under the age of 18 were excluded from the study. All course information was equally available to participants and non-participants. No academic advantage such as extra credit was given to students participating in the study. There was no academic penalty for non-participation in the study. A five-dollar gift card to the campus bookstore was offered to everyone completing the study in compensation for time spent completing the pre- and post-tests. The sampling goal was set at 30 for this pilot

study. Fifty-one students agreed to participate and signed the informed consent

form. Fifty students completed the study procedures.

Setting

Community colleges don't generally have formal institutional review

boards. At the campus selected for this study, the Planning and Research Office

(PRO) weighs in on human subject matters, and the appropriate administrator

provides approval, or requests modifications to the research proposal. No PRO or

administrator modifications to the proposal for this project were requested, and the

Dean of Student Services provided a letter of support. Three STI workshops were

held in Fall 2017: 1 for each of the 3 sections of Human Sexuality classes. The

workshops were held in the usual classroom location during the regularly

scheduled class meeting time, and served as a lecture replacement. The instructor

also attended the workshops and participated in group discussions.

Procedures

The workshops began with an assessment of baseline knowledge about

STIs, attitudes towards safer sex, and self-efficacy for engaging in safe sex

behaviors. This five minute pre-test was followed by one-hour sessions of didactic

information and group discussion using a confidential classroom response system,

sometimes called clickers. The class response data was shared anonymously in

real time and compared with findings from the ACHA-NCHA in an effort to

correct misconceptions about social norms. This social norming data is intended to

begin to increase student knowledge and modify beliefs about STI risk. Prevention

strategies such as correct condom use, sexual history taking, and negotiating for

safe sex were also reviewed. Sample scripts, example videos and role-playing

opportunities for negotiating for safe sex were provided. Knowledge, attitude, and self-efficacy were assessed at the completion of the workshop with a five-minute post-test.

Data Collection

After informed consent was obtained, students were asked to complete a demographic survey. Demographic data collected included age, gender, ethnicity and relationship status. No personal identifying information was collected, and a numbering system was used to match pre- and post-test responses.

The research variables knowledge, attitude, and self-efficacy were measured at pre- and post-test using research instruments with established validity and reliability. STI knowledge was measured with Jaworski and Carey's Sexually Transmitted Disease Knowledge Questionnaire (2007). Attitude toward safer sex behavior and self-efficacy for engaging in safer sex behavior were measured with Redding and Rossi's HIV & Safer Sex: Decisional Balance and HIV & Safer Sex: Self Efficacy (1999). Each of these instruments have been made available to other researchers through the Measurement Instrument Database for the Social Sciences (N. D.), and can be reviewed in Appendix A, B and C.

CHAPTER 4: RESULTS

All adult students (age 18 and over) attending Human Sexuality classes during the second week of November 2017 were invited to join the study. Fifty-one students agreed to participate and signed informed consent forms. Descriptive statistics were used to analyze the demographic data collected from the study participants. Two tailed paired t-tests were employed in analyzing the pre- and post-test data for knowledge, attitude, and self-efficacy.

Demographic Data Analysis

Demographic data analyzed include self-reported age, gender, ethnicity, and relationship status (See Table 1). The mean age of participants was 21, with a range of 18 to 28 years of age. More than half of the participants (57%) reported their gender as female, 39% reported being male, and 3.9% (2) identified as gender non-binary. White was the most commonly reported ethnicity at 55%, followed by Hispanic at 37%, African American and Filipino at 2.0% each, and mixed ethnicity at 3.9%. Monogamy was the most commonly reported relationship status, with 41% reporting being in a monogamous relationship for three or more months, and 14% reporting being in a monogamous relationship for less than three months. Twenty eight percent of study participants reported not being in any intimate relationship, 12% reported being in non-monogamous relationships, and 5.9% reported their relationship status as dating.

Table 1

Sample Demographics

Characteristic		Total	Percentage
Age			
Range	18 – 28		
Mean	21.0		
Median	21		
Gender			
Female		29	57%
Male		20	39%
Non-binary		2	3.9%
Ethnicity			
White		28	55%
Hispanic/Latino		19	37%
African American		1	2.0%
Filipino		1	2.0%
Mixed		2	3.9%
Relationship Status			
Monogamous >3ms		21	41%
Monogamous <3ms		7	14%
Dating		3	5.8%
Non-monogamous		6	12%
Not intimate		14	27%

Pre- and Post-Test Data Analysis

Each study participant was asked to complete a pre-test prior to the workshop intervention, and a post-test at the completion of the workshop. The same tools were used to measure STI knowledge, attitude, and self-efficacy for both the pre- and post-test, as discussed in Chapter 4: Methodology.

STI Knowledge

A paired samples t-test was run to determine the difference between the pre-test and post-test STI knowledge scores, $t(49) = 5.4$, $p < 0.001$ (see Figure 1).

There was a significant increase between pre-test STI knowledge scores (M = 13, SD = 5.9) and post-test STI knowledge scores (M = 17, SD = 5.2).
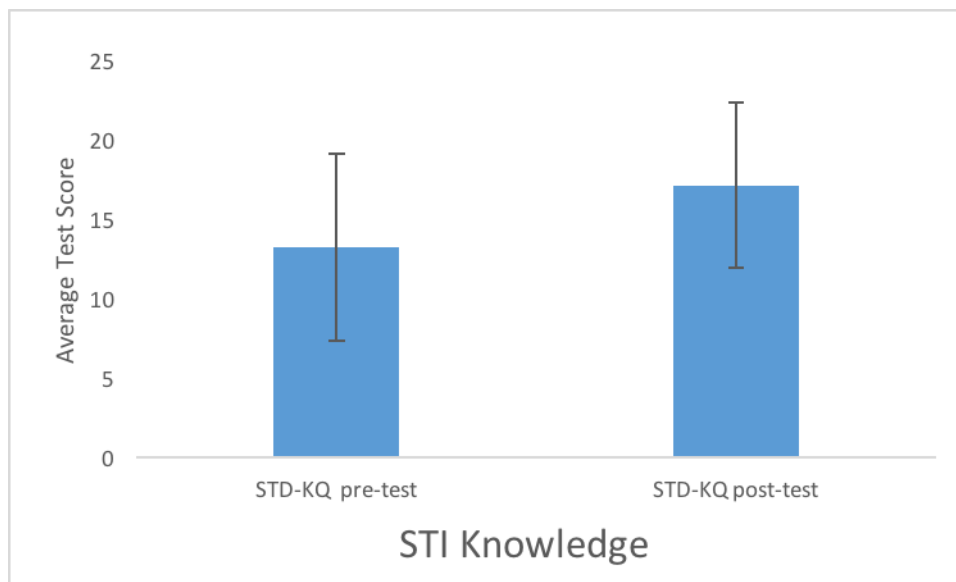

Figure 1. STI knowledge pre- and post-test as measured by STD-KQ tool. Error bars reflect standard deviation.

Attitudes Regarding Safer Sex

The tool selected to measure attitude towards safer sex selected for this study includes two subscales: advantages of safer sex, and disadvantages of safer sex. Two paired samples t-tests were run to determine the difference between the pre-test and post-test attitude scores. First, advantages to using condoms scores were compared at pre- and post-test. The post-test advantages attitude scores (M = 4.1, SD = 0.87) were significantly higher than the pre-test advantages attitude scores (M = 3.9, SD = 1.0), t(47) = 3.2, p < 0.05 (see Figure 2). Next, disadvantages of using condoms scores were compared at pre- and post-

test. Paired t-testing showed the post-test scores (M = 1.9, SD = 0.97) to be significantly lower than the pre-test scores (M = 2.2, SD = 1.1), t(47) = 2.0, p < 0.05 (see Figure 3).
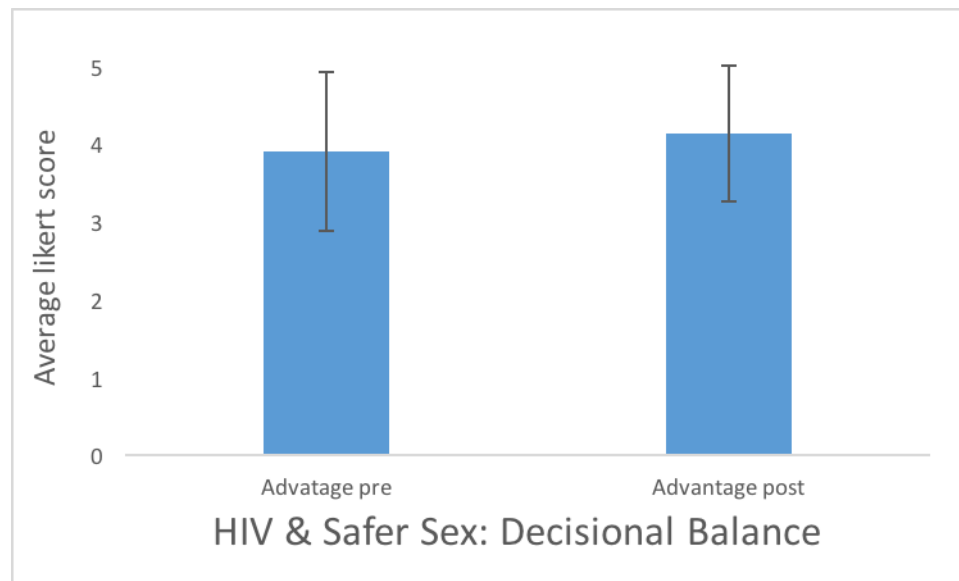
Figure 2. Attitudes regarding the advantages of safer sex before and after workshop. Error bars illustrate standard deviation.
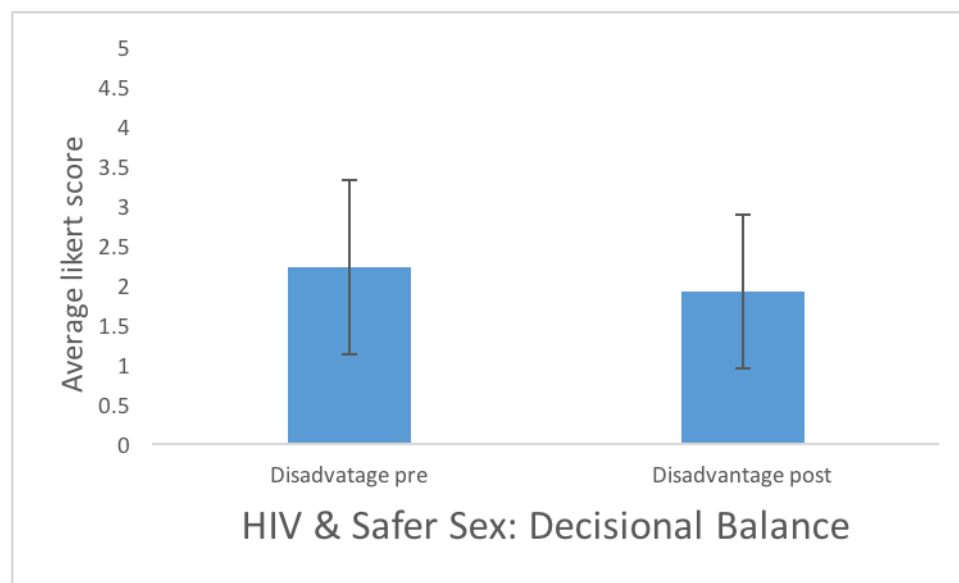
Figure 3. Attitudes regarding the disadvantages of safer sex before and after workshop. Error bars reflect standard deviation.

**Self-Efficacy for Engaging in Safer
    Sex Behaviors**

      The mean pre-test sore for self-efficacy was 3.06, with a standard deviation of 1.02. The mean post-test score for self-efficacy was 3.08, with a standard deviation of 1.023. The paired t-test for self-efficacy scores showed that there was no significant difference between pre- and post-test self-efficacy scores in this sample ($t(46) = 0.25$, $p > 0.05$).

CHAPTER 5: DISCUSSION

Limitations

This study is limited by its pilot study status, and the smaller sample size and less robust experimental design inherent to pilot studies. Potential threats to internal validity include convenience sampling, test exposure, and differing maturity levels among participants. The study sample is more representative of the student body than might be expected from convenience sampling, but the study participants are younger, whiter and more female than the population from which they were drawn.

The community college where the study was conducted reports a mean age of 28.5, median of 23, and a range of 14 - 98 (Cabrillo College, 2018). The sample mean and median age were both 21, with a range of 18-28. Although the study sample skews to the younger end of the age spectrum for the population, it captures more of the at-risk population of 15 to 24 year olds, with only five participants falling outside of the vulnerable age range. Future studies should seek institutional review board approval to include minors, as vulnerability to STIs might outweigh any potential harm research participation might entail. The ethnic makeup of the sample was similar in proportion to the campus population, but had a higher percentage of white students (55% sample, 47% population), and a lower percentage of Hispanic students (37% sample, 42% population). The sample was also proportionately similar to the population for gender, though the sample include a higher percentage of female students (57%) than the population (54%). Statistics for gender non-binary students are not reported by the college. It is therefore difficult to determine whether the 3.9% non-binary identifying students in the sample is representative of the population, or if students ready to share this

personal detail on a survey are more likely to enroll in human sexuality, and elect to participate in study addressing sexuality.

Sampling exclusively from Human Sexuality courses introduces selection bias. Students who enroll in Human Sexuality may be more interested in STIs and STI prevention than the average student. The study design would be improved by random sampling from the general student population, and the addition of a control group. Increasing the sample size would better approximate the population demographics. The generalizability of the results would be improved by these measures.

Implications for Nursing Practice

This pilot study demonstrates the applicability of ITHBC to STI prevention, and its utility in interventional design. Social facilitation may be an effective motivator for sexual behavior change among college students. The study findings show promise for ITHBC based intervention improving STI knowledge, and attitudes towards condom use. The lack of significant change in self-efficacy scores suggests that a one-time 60-minute intervention may not be sufficient to inspire confidence in self-regulation skills and abilities among students. Increasing time spent role playing safe sex negotiation, and including a follow-up session may improve self-efficacy scores.

ITHBC based intervention has the potential to increase engagement in STI prevention behaviors in college students and other vulnerable youth. This proximal outcome would then result in the distal outcome of improved sexual health, and decreasing STI rates. The findings and recommendations of this study will be shared with local health agencies, and health providers throughout the

California Community College system in hopes of inspiring reenergized efforts to reverse the rising tide of STI rates.

Conclusions

This project shows Ryan's ITHBC to be a useful framework for designing STI prevention interventions. Social facilitation may be a valuable tool in motivating sexual behavior change among college students. Study findings show promise for ITHBC based interventions improving STI knowledge, and attitudes towards safer sex. This area of research warrants further exploration. Follow up studies with emphasis on rehearsing safe sex behaviors, and reinforcement of self-regulation skills are recommended. Longitudinal studies will enable reinforcement of social facilitation, and monitoring of proximal and distal outcomes. The intervention could eventually be implemented on each of the 110 California Community College campuses, and adapted for use in other settings. This DNP project could be the beginning of a powerful nurse delivered, behavior health, patient education approach to reversing the trend of increasing STI rates.

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APPENDICES

APPENDIX A: THE SEXUALLY TRANSMITTED DISEASE
KNOWLEDGE QUESTIONAIRE

The Sexually Transmitted Disease Knowledge Questionnaire
(STD-KQ; Jaworski & Carey, 2007)

Instructions: For each statement below, please circle true (T), false (F), or I don't know (DK). If you don't know, please do not guess; instead, please circle DK.

		True	False	Don't Know
1.	Genital Herpes is caused by the same virus as HIV.	T	F	DK
2.	Frequent urinary infections can cause Chlamydia.	T	F	DK
3.	There is a cure for Gonorrhea.	T	F	DK
4.	It is easier to get HIV if a person has another Sexually Transmitted Disease.	T	F	DK
5.	Human Papillomavirus (HPV) is caused by the same virus that causes HIV.	T	F	DK
6.	Having anal sex increases a person's risk of getting Hepatitis B.	T	F	DK
7.	Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina).	T	F	DK
8.	There is a cure for Chlamydia.	T	F	DK
9.	A woman who has Genital Herpes can pass the infection to her baby during childbirth.	T	F	DK
10.	A woman can look at her body and tell if she has Gonorrhea.	T	F	DK
11.	The same virus causes all of the Sexually Transmitted Diseases.	T	F	DK
12.	Human Papillomavirus (HPV) can cause Genital Warts.	T	F	DK
13.	Using a natural skin (lambskin) condom can protect a person from getting HIV.	T	F	DK
14.	Human Papillomavirus (HPV) can lead to cancer in women.	T	F	DK
15.	A man must have vaginal sex to get Genital Warts.	T	F	DK
16.	Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women.	T	F	DK
17.	A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina.	T	F	DK
18.	If a person tests positive for HIV the test can tell how sick the person will become.	T	F	DK
19.	There is a vaccine available to prevent a person from getting Gonorrhea.	T	F	DK
20.	A woman can tell by the way her body feels if she has a Sexually Transmitted Disease.	T	F	DK
21.	A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner.	T	F	DK
22.	There is a vaccine that prevents a person from getting Chlamydia.	T	F	DK
23.	A man can tell by the way his body feels if he has Hepatitis B.	T	F	DK
24.	If a person had Gonorrhea in the past he or she is immune (protected) from getting it again.	T	F	DK
25.	Human Papillomavirus (HPV) can cause HIV.	T	F	DK
26.	A man can protect himself from getting Genital Warts by washing his genitals after sex.	T	F	DK
27.	There is a vaccine that can protect a person from getting Hepatitis B.	T	F	DK

APPENDIX B: HIV AND SAFER SEX: DECISIONAL
BALLANCE

HIV & Safer Sex: Decisional Balance:

Redding & Rossi (1999)

Listed below are several possible <u>advantages</u> of using condoms. HOW IMPORTANT is each of these advantages <u>to you</u> in deciding whether or not to use condoms for either vaginal or anal sex, using the following 5 point scale:

1 = Not Important
2 = Slightly Important
3 = Moderately Important
4 = Very Important
5 = Extremely Important

1.	I would feel safer.
5.	It would build trust.
6.	I'd feel more responsible.
7.	Sex would feel cleaner.
10.	Sex would be less worrisome.

Listed below are several possible <u>disadvantages</u> of using condoms. HOW IMPORTANT is each of these disadvantages <u>to you</u> in deciding whether or not to use condoms for either vaginal or anal sex, using the following 5 point scale:

1 = Not Important
2 = Slightly Important
3 = Moderately Important
4 = Very Important
5 = Extremely Important

1.	It would be a lot of trouble.
2.	It would make sex less spontaneous.
3.	My partner would be angry.
4.	It would make sex less exciting.
6.	Sex would take longer.

APPENDIX C: HIV AND SAFER SEX: SELF EFFICACY

HIV & Safer Sex: Self Efficacy
Redding & Rossi (1999)

Safer sex is first defined for participants as any combination of the following behavioral strategies:

A) <u>Abstinence</u> from vaginal and anal intercourse.

B) <u>Condom Use</u> with all vaginal and anal sexual partners.

C) Sexually <u>exclusive</u> relationship with only <u>one partner</u> in the past year who has <u>tested negative</u> for HIV antibodies.

Participants are then instructed to rate their level of confidence in having safer sex and temptation to have unprotected sex on a five-point Likert scale (1 = Not at all confident/tempted to 5 = very confident/tempted) in the following situations. Items used for the Confidence in Safer Sex (CSS) and Temptation for Unprotected Sex (TUS) scales ordered by subscale.

Sexual Arousal

When I really want sex. A

When I am really sexually excited. B

When I am really sexually aroused. C

Substance Use

When I am affected by alcohol or drugs. A

When I am a little drunk or high. B

When I am under the influence of alcohol or drugs. C

Partner Pressure

When my partner pressures me to take a chance this time. A

When my partner gets annoyed about having safer sex. B

When my partner is insulted that I want safer sex. C

Negative Affect

When I am upset. A

When I feel depressed. B

When I am feeling angry. C

Perceived Low Risk

When there's not much risk. A

When the risk seems low. B

When I think the risk is small. C