

2017

# U.S. Young Adults STDs, Risk Perception, Risk Behaviors, and Health Information Seeking

Amanda Robison-Chadwell  
*Walden University*

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# Walden University

College of Health Sciences

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Amanda Robison-Chadwell

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## Review Committee

Dr. Donald Goodwin, Committee Chairperson, Public Health Faculty

Dr. Wen-Hung Kuo, Committee Member, Public Health Faculty

Dr. Patrick Tschida, University Reviewer, Public Health Faculty

Chief Academic Officer

Eric Riedel, Ph.D.

Walden University

2017

Abstract

U.S. Young Adults STDs, Risk Perception, Risk Behaviors, and Health Information

Seeking

by

Amanda Robison-Chadwell

MPH, Walden University, 2011

BA, California State University, Sacramento, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

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## Abstract

Sexually transmitted diseases (STD) are preventable conditions for which treatment failure (specifically in gonorrhea) is becoming problematic. U.S. young adults (20-29 years) have high rates of STD incidence and prevention of these diseases, but reaching them to provide primary prevention educations is challenging due to low perceived susceptibility to infection and lack of knowledge about how young adults seek health information. The purpose of this quantitative survey study was to assess the association between perceived susceptibility to STDs, sexual risk behavior, and the acquisition of health information as it pertains to sexual health topics in young adults. The Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) were used in combination as the theoretical foundation of this study. Data collection was done using an adapted version of the Health Information National Trends Survey (HINTS), the Condom Use Self Efficacy Scale (CUSES), and an adapted version of the Marin County (California) Health Department's Sexual Risk Survey. There were 128 eligible participants and analysis of the data showed that the internet was the primary source of both general health information (87.5%) and STD specific health information (75.8%). A multiple regression analysis showed that there was no statistically significant correlation between perceived susceptibility and health information seeking or sexual risk ( $p > .05$ ). This can aid in positive social change by prompting additional research on the subject of STD prevention in young adults through the design and dissemination of tools for education that may reduce the rate of STDs or other health ailments.

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## Dedication

This is dedicated to my number one supporter; my husband. He has supported my ever career and academic effort for the last seventeen years and this could not have been accomplished without him.

## Acknowledgments

I would like to acknowledge my Committee for all their support in putting this together and helping point me in the right direction. I also want to acknowledge the many other Walden University professors who have helped me get to this point.

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## Chapter 1: Introduction

### Introduction

This quantitative study focuses on sexually transmitted infection (STI) risk behavior and the association with health information seeking in young adults and STI risk behavior. STIs are a large threat that contributes to disability, infertility, and other negative consequences for men and women around the world (Rowley, Toskin, Ndowa, 2012). The World Health Organization (WHO) 2008 estimates infection with STIs is a significant contributor to morbidity and mortality. In the Americas, it has been estimated that in 2008 there were approximately 25.2 million adults infected with *Chlamydia trachomatis*, 3.6 million with *Neisseria gonorrhoeae*, and 57.8 million with *Trichomonas vaginalis* and the total worldwide estimate was nearly 500 million for all STIs (Rowley et al., 2012). Not all schools in the U.S. offer comprehensive sex education programs to adolescents according to the National Conference of State Legislatures (NCSL, 2015) and as such many enter adulthood without knowledge of STI prevention and without an understanding of what behaviors put them at risk. Those with a lack of understanding of risk behaviors and proper prevention have been found to have low perceived susceptibility to infection despite their risk behaviors (Ethier, Kershaw, Niccolai, Lewis, & Ickovics, 2003; Pollack, Boyer, & Weinstein, 2013). In this study self-perception was measured and a risk assessment was conducted as well. This allowed for the measurement of both perceived risk and true risk to determine the level of association. In addition, a survey examining health information seeking behavior was used to assess health information seeking behavior as it relates to sexual risk behaviors and perceived susceptibility.

One of the questions that this study intended to answer was whether health information seeking behaviors are related to perceived susceptibility in this group (young adults 20 to 29

years of age). If health information seeking is tied to perceived susceptibility, then it is logical to think that young adults only seek information if they believe they are at risk or have already contracted an STI. This is a problem given that the literature is continually demonstrating low perceived susceptibility (Ethier et al., 2003; Pollack et al., 2013). Determining the answer to this question could be useful in guiding public health toward a more effective paradigm of assessing risk to focus on individuals with a low perception of risk that is mismatched to their actual risk. The Centers for Disease Control and Prevention (CDC, 2013a) highlight *Gonorrhea* as a significant issue due to antibiotic resistant bacteria causing significant public health concern (Finley et al., 2013; French, 2010; Ohnishi et al., 2011; Somani, Bhullar, Workowski, Farshy & Black, 2000). Bacterial STIs are among those infections that have seen the development of resistance and they are preventable (CDC, 2015b). To effectively reduce the rate of STIs it is necessary to understand how young adults receive information about health concerns and find a way to utilize those information sources to educate about STI prevention. Since the concern here involves both access to and use of sexual health information as well as sexual risk behavior and perceived susceptibility among participants to determine the degree of correlation (using multiple regression analysis) between perceived susceptibility, sexual risk behavior and health information seeking behavior.

In this chapter, there is a brief background in which a sampling of recent peer-reviewed literature concerning STIs in young adults, antibiotic resistance in STIs, and health information seeking behavior have been examined. From there is the statement of the problem that this research intended to address. There is a gap in the literature that will be examined in more detail the following chapter. The theoretical framework for this research is a combination of the use of the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) as previous research

has shown that integration of theoretical models is often more effective than individual models at predicting and analyzing human behavior (Carpenter, 2010; Montanaro & Bryan, 2014). This chapter will present the research questions, assumptions, scope and limitations of this research.

This research can contribute to positive social change by aiding public health in better understanding the health information seeking behaviors of young adults as they relate to STI risk perception. Better understanding of the relationship between seeking health information and how that is influenced by perceived risk could aid in the development of more effective intervention programs to reduce the burden of STIs in young adults in the United States. Decreasing the rate of STI infection in young adults can lead to positive social change not only by aiding in addressing the development of antibiotic resistance (Somani et al., 2000), but also to address the negative health outcomes that result from STIs such as infertility, pelvic inflammatory disease (PID), ectopic pregnancy and tubal scarring (Workowski & Berman, 2010).

### **Background**

The literature chosen was selected based on subject matter keywords through electronic database searches. The subject matter keywords pertain to STIs and the use of the HBM and the TPB in analysis of programs and STI prevention research.

The willingness of an individual to engage in behaviors that prevent STIs such as the use of condoms and reducing the number of sexual partners is predicated on their belief that they may be at risk of contracting an STI (Pollack et al., 2013; Crosby et al., 2014). That perception is impacted by numerous factors and research has shown that the behaviors that put an individual at direct risk may not be recognized (Crosby et al., 2014; Nunn et al. 2011). Part of helping young adults develop an understanding of their risk of an STI is to ensure that they are educated in sexual health (Chin et al., 2012). Education may aid in leading to more realistic perceptions of

risk and potentially more effective preventative measures that could then lead to a reduction in STIs.

The recognition of this issue of low perceived susceptibility is not new as it has been documented in the literature (Ethier et al., 2003; Pollack et al., 2013). One challenge in addressing perceived susceptibility is that young adults receive little attention in terms of addressing such health issues compared to the attention paid to adolescents (Park, Scott, Adams, Brindis & Irwin, 2014). Attention paid to adolescents for sexual health education is sensible as the goal is to reach them before sexual initiation with the information. One might assume that a paradigm of sexual health education focused on adolescents takes away the need to educate young adults, who, under such a paradigm should have received such information during their adolescent years. However, there are gaps in our sexual education system in the U.S. that prevent sex education from reaching many adolescents. Those gaps are addressed below in the Problem Statement and in Appendix G.

A gap in the literature is that there is little information about the way that young adults seek health information and how low perceived susceptibility to STIs affects their information seeking behaviors.

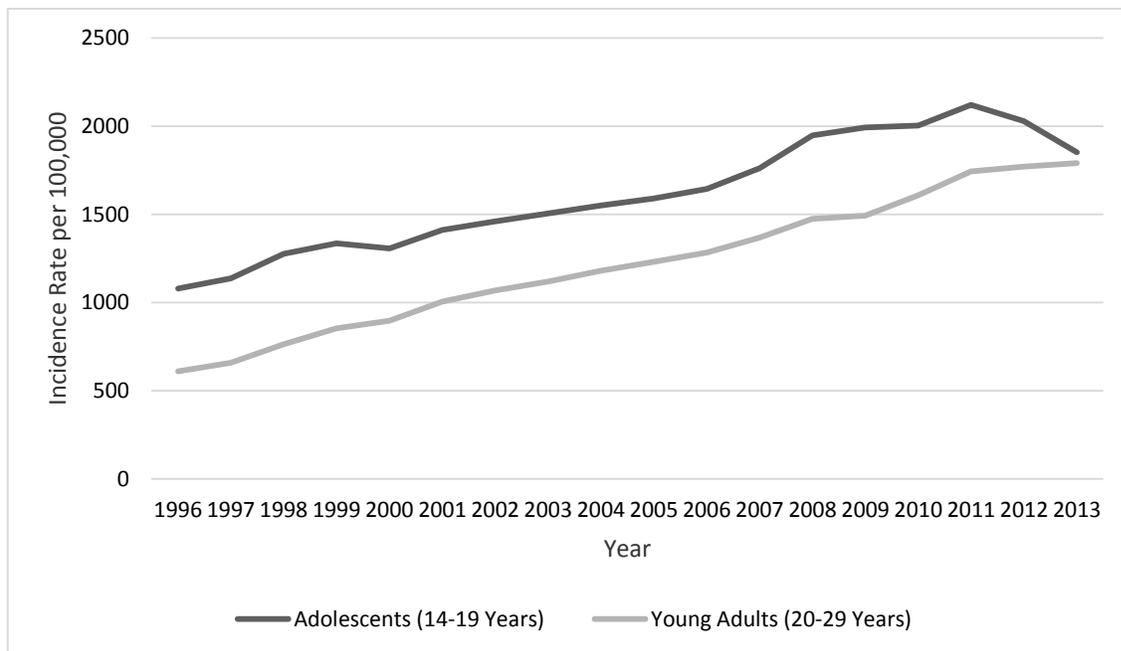
### **STIs and Antibiotic Resistance**

Of public health concern is the issue of reemerging infectious diseases. STIs have risen worldwide according to the most recent WHO incidence estimates which compared rates from 2005 to those in 2008. *Chlamydia* has seen a 4.1% increase in incidence, *Gonorrhea* has seen a 21% increase and *Trichomonas vaginalis* has seen an 11.2% increase (Rowley et al., 2012). The conditions selected for research in this dissertation are bacterial STIs rather than viral. There is a concern among public health professionals about STIs that are treated with

antibiotics. Non-viral sexually transmitted infections (STI) have been managed for decades with the use of antibiotics and in much the way that any organism does bacterial organisms adapt (Davies & Davies, 2010). One adaptation has been the development of resistance to antibiotics in many bacterial organisms that cause STIs. The CDC have highlighted *Gonorrhea* as among the most concerning of STIs that have developed resistance to many antibiotics (CDC, 2013a). This is not unique to the United States as the World Health Organization has also highlighted antibiotic resistance as a public health threat. Worldwide surveillance has found that antibiotic resistance in STIs is a global trend (European Centre for Disease Prevention and Control, 2010; WHO 2012; WHO, 2015).

### **STIs in U.S. Young Adults**

US young adults (20-29 years) have high rates of STIs, US adolescents (15-19 years) have even higher rates as illustrated in Figure 1 (*Gonorrhea*) and Figure 2 (*Chlamydia*).



*Figure 1.* Line graph showing rate trends between adolescents and young adults from 1996 to 2013 for *Chlamydia* in the U.S. (CDC, 2015c)

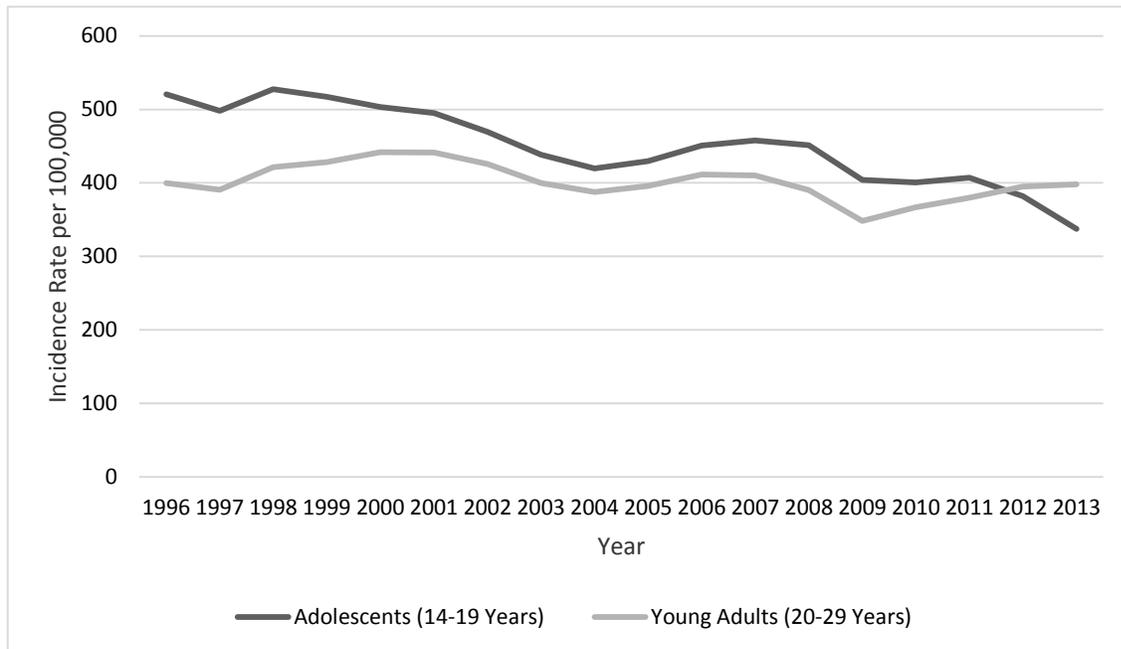


Figure 2. Line graph showing rate trends between adolescents and young adults from 1996 to 2013 for *Gonorrhea* in the U.S. (CDC, 2015c)

Figures 1 and 2 show that while the rates among adolescents are higher than those of young adults for most of the time there has been a recent shift with the rates for *Gonorrhea* in young adults exceeding those of adolescents and the rates in adolescents for *Chlamydia* have begun a decline while those for young adults are still on the rise. This is part of the reason for a focus on young adults. They are demonstrated as a risk population via surveillance data and better understanding how to mitigate their risk is of importance. It may be that this increase in *Chlamydia* is linked to increased surveillance which has the potential to identify more cases including those that are asymptomatic (Johnson et al., 2014).

### Condom Use Studies

One of the commonly recommended strategies for preventing STIs is the regular and proper use of condoms. To discover the best methods to encourage the use of condoms

researchers have examined condom use efficacy patterns as a means of understanding attitudes and patterns of condom use (Wang, 2013). The Condom Use Self-Efficacy Scale (CUSES) is a tool that has been used regularly by researchers to better understand condom use patterns and attitudes and it will be used again in this study (Thomas, Yarandi, Dalmida, Frados, & Klienert, 2015). The CUSES was developed by Brafford and Beck (1991). Forsyth, Carey and Fuqua (1997) found that the CUSES scale demonstrates predictive validity and internal consistency. They determined that the scale correlates with other such self-report measures such as the Contraceptive self-efficacy scale ( $r = .55, p < .001$ ) and the Attitudes toward Condoms Scale ( $r = .51, p < .001$ ). They also supported the findings of Brafford et al. (1991) when they found that condom users scored higher than non-condom users indicating that condom users have higher self-efficacy and those with more sexual experience also scored higher. Brien, Thombs, Mahoney and Wallnau (1994) utilized CUSES and demonstrated discriminant and convergent validity of the instrument. In addition, their study found that those condom users that utilized condoms as a method of birth control scored higher and condom users with an STI history did as well compared to those without STI histories. The CUSES scale has also been found to demonstrate predictive validity. They also found that CUSES demonstrates convergent validity was shown by the relationship of CUSES to other similar scales. To assess the scale, they examined the instrument using factor analysis. The first factor related the ability to use condoms and they found that reliability was good, but that deletion of the question "I feel confident I could gracefully remove and dispose of a condom when we have intercourse" resulted in a slightly higher Chronbach's Alpha measure of .78. They also found that CUSES has high internal consistency (Chronbach's Alpha = .81) when they considered the "Partner Disapproval" items of the scale. The third and final factor assessed related to assertiveness with condom use which

possessed good reliability (Chronbach's Alpha = .80). Forsyth et al., (1997) caution that use of regression analysis when considering condom use negotiation skills did not consider variations in interpersonal communication and in addition did not consider variability in condom use application scores and thus individuals with higher self-efficacy scores may still lack competence to negotiate or appropriately utilize condoms. This leads to concerns about the use of CUSES alone for risk reduction. Though, for the purposes of this study the use of CUSES is specifically for measuring condom use self-efficacy and other instruments in conjunction with CUSES will be utilized to better assess risk. Barkley and Burns (2000) were interested in factorial validity of CUSES when used in a culturally diverse setting. They found that CUSES was effective in a diverse college student population, but did note a limitation in their study being that the convenience sample was primarily Hispanic and may not be generalizable.

Applications of the TPB and the HBM are relevant to condom use behaviors in the prevention of STIs. For example, Fennell (2011) noted that their female participant's perception of social norms was that carrying condoms was more a male responsibility while ensuring use of contraceptive pills was the female's responsibility. In addition, condoms were a perceived barrier to the pleasure associated with intercourse for several participants. Participants rarely considered condoms important for prevention of STIs as they were more concerned about prevention of pregnancy. This proposed study will inquire about use of alternative methods of birth control and examine the degree to which alternative birth control use affects condom use patterns.

### **Health Information Dissemination**

Research has shown that perceived susceptibility in the target population for this study (young adults) is an issue because they are engaging in behaviors that put them at increased risk of contracting an STI, but they do not perceive themselves as susceptible to contracting an STI

(Ethier et al., 2003). Many studies have considered how adolescents can be reached beyond the classroom. Such public health interventions could be effective in reaching young adults once the way that young adults obtain health information is better understood. Zimmerman et al. (2007) and Van Stee et al. (2012) both examined the use of public service announcements (PSA) as an educational tool. Zimmerman et al. (2007) conducted PSAs offered on television in Lexington Kentucky and the comparison city of Knoxville Tennessee saw no intervention. At the time that the study took place trends in condom use were on the decline in Knoxville and constant in Lexington (Zimmerman et al., 2007). They found that there was a significant ( $p < 0.05$ ) increase in condom use self-efficacy directly after the PSA that sustained for the 3-month follow-up period, but the downward trend in condom use that existed before the intervention resumed after that time (Zimmerman et al., 2007). Van Stee et al. (2012) examined PSAs as a means of educating young adults from a qualitative perspective. Their interest was in the perception of the campaigns that were utilized in the Zimmerman et al. (2007) study. Van Stee et al. (2012) found that the messages caught the attention of many participants due to the setting (one PSA was in a nightclub setting and the other was a sports scenario) and that young adults continued watching while unaware of the intention of the message initially. Respondents in this study did seem to agree on the importance of contraception and the usefulness of the message though they did not think it would apply to them directly as they felt the messages were more useful to others (Van Stee, et al., 2012)

Recent research has also considered the use of social media and mobile technology platforms for health education (Scanfield, Scanfield & Larson, 2010; Swendeman & Rotheram-Borus, 2010). Swendeman & Rotheram-Borus (2010) focused on the potential use of mobile phones for HIV/STI education. They found that it is a feasible option given how few adults now

use actual computers to access email and the internet (Baur, 2008). Another study by Kubicek, Beyer, Weiss, Iverson and Kipke (2010) examined barriers to traditional means of sex education particularly as it relates to the men-having-sex-with-men (MSM) community and they found that traditional means of sex education were not perceived as effective because traditional sex education programs are catered to heterosexual relationships and lack relevance to their community. A barrier for these participants was also issues of privacy. They cited fear of someone they knew finding out about their sexuality if they spoke with their physician and they did not talk with their physician at all about such issues unless they suspected a medical problem that was associated (i.e., STI, HIV/AIDS) Magee, Bigelow, DeHaan and Mustanski (2012) found similar patterns in their examination of Lesbian, Gay, Bisexual and Transgender (LGBT) and their perception of sex education and information. The LGBT community participants perceived barriers to seeking information such as lack of interest, unreliable information available online, and stigma. They found that their participants typically only sought information when there was suspicion of disease or some other motivating factor, but not typically for the sake of prevention self-education. DeHaan, Kuper, Magee, Bigelow and Mustanski (2013) conducted a qualitative study examining the use of the internet among LGBT youth. Their participants included 32 LGBT youth between 16 and 24 years of age. Among their participants 13 noted using offline sources of information as their primary sources and 7 identified using the internet as their primary source. Upon further examination those using offline sources were in communities with LGBT centered programs that gave them access to trusted information. Those citing use of online sources stated lack of appropriate information available in their sex education programs at school or elsewhere. Use of online resources were cited by some youths as easier because of reduced stigma compared to in person interaction. The use of social media platforms to reach the

young adult population has been a trend with the importance of mobile technology in the lives of most young adults. The use of mobile technology may well be found in this proposed study to be an important avenue toward finding health information among the demographic of interest particularly due to the ability to reduce stigma as cited by the WHO (2007) (in the global strategy for the prevention and control of STIs) as a potentially effective strategy that programs can use to reduce STIs.

### **Problem Statement**

In recent years an increase in antibiotic resistance has been labeled a significant public health concern (Finley et al., 2013; French, 2010; Ohnishi et al., 2011; Somani et al., 2000). Among those is an increase in resistance among agents of Sexually Transmitted Infections (STI) particularly *Neisseria gonorrhoea*. Workowski and Berman (2010) noted that *Neisseria gonorrhoeae* has developed resistance to several antibiotics (*cefixime, azithromycin, ciprofloxacin, penicillin, and tetracycline*). In addition to resistance in *Neisseria gonorrhoeae* research has shown that *Chlamydia trachomatis* has shown trends in resistance (Hocking et al. 2013). One of the ways to reduce the rate of antibiotic resistance is to prevent these infections from occurring. However, that is complicated with STIs particularly when research has shown that perceived susceptibility is low (Ethier et al., 2003; Pollack et al., 2013). Hocking et al. (2013) found in a study that distinguishing between a reinfection with *Chlamydia trachomatis* versus treatment failure has been one of the challenges in surveillance and management of infections. There are different assessments of the level of treatment failure in *Chlamydia trachomatis* with azithromycin treatment failure of 2-3% as determined by Lau and Qureshi (2002) while other studies have cited a treatment failure of up to 8% (Batteiger et al, 2010; Golden et al., 2005).

Overall trends in STIs due to *Neisseria gonorrhoeae* and *Chlamydia trachomatis* have led to concern among public health professionals as trends in rates of reported STIs shown in Figure 1 remain elevated. Public health faces a conundrum with prevention of STIs among young adults. The U.S. system of sex education for adolescents is variable from one state to the next (see Appendix G). Only 22 states and the District of Columbia require sex education in public schools and 33 states and the District of Columbia require that students receive information about HIV/AIDS. Only 19 states require that sex education be medically and scientifically accurate. 37 states and the District of Columbia require allowance of parental involvement in sex education, 3 states require parental consent before a child can receive sex education, and 35 states allow parents to opt out of sex education curriculum entirely (NCSL, 2015). Only 18 states and the District of Columbia require that information on contraception be provided and 25 states focus on abstinence only education (see Appendix G). While some research does support that abstinence only education can be useful in reducing sexual activity in adolescents it still does not provide information on safe sex that can be utilized when individuals enter adulthood (Jemmott, Jemmott & Fong, 2010a). The question then, is if the system cannot provide the information on safe sex and STI prevention behaviors to all or most adolescents and low perceived susceptibility to STIs among young adults precludes some from self-educating about STI prevention, then how can public health professionals proactively reach them (Vivancos, Abubakar, Phillips-Howard & Hunter, 2013)?

The research here will focus on understanding health information seeking in-young adults as a means of better understanding how to proactively reach individuals in the demographic of interest.

## **Purpose**

The purpose of this quantitative survey study was to assess the association between perceived susceptibility to STIs, sexual risk behavior and the acquisition of health information as it pertains to sexual health topics in young adults. By understanding the how young adults receive health information public health professionals may be better able to navigate challenges with providing STI preventative health information.

## **Research Questions and Hypotheses**

RQ1 – Quantitative: How closely does perceived STI susceptibility (as measured in HINTS) correlate with evidence of STI risk (as measured by CUSES)?

H<sup>A</sup>: There is a statistically significant correlation between perceived susceptibility and STI risk.

H<sup>0</sup>: There is no correlation between perceived susceptibility and STI risk.

RQ2 -- Quantitative: How do young adults (20-29 years) obtain health information?

H<sup>A</sup>: Young adults use electronic platforms (internet, social media) or word of mouth for most information.

H<sup>0</sup>: Young adults use other sources for health information.

RQ3 -- Does perceived susceptibility/risk of a condition have a relationship with health information seeking behaviors?

H<sup>A</sup>: There is a relationship between health information seeking and perceived susceptibility.

H<sup>0</sup>: There is no relationship between perceived susceptibility and health information seeking.

## **Theoretical Framework**

The Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) were used as a framework for this study. The TPB offers a strength to HBM as the HBM has been noted as lacking in that it is not ideal in predicting the actual initiation of behaviors (Carpenter, 2010; Montanaro & Bryan, 2014).

### **The Health Belief Model**

The HBM was developed in 1974 by Irwin Rosenstock in his publication *The Health Belief Model and Preventative Health Behavior*. The model was intended to predict a person or groups willingness to engage in a behavior (Rosenstock, 1974). The HBM is effective in determining just willingness to engage in a behavior, but not necessarily follow through with the behavior. For that reason, the TPB, which has been shown to be more effective than HBM at predicting engagement in a behavior (Carpenter, 2010) will be used as well.

The HBM is designed to predict behavior and does so using several constructs. One such construct is perceived severity. Perceived severity is the construct that states that an individual's willingness to engage in behavior change is based on their perception of severity of the health problem. Perceived susceptibility is another construct and this construct states that the individuals must not only perceive severity, but must also perceive that he/she is susceptible to infection. Perceived benefits are an important construct of the model that points to the need for an individual to see benefits to the change in behavior. Those benefits may be directly related to reduce risk of the health outcome or another benefit, but the individual is not likely to engage in the behavior without some incentive for having done it. Perceived barriers are the next construct of the model and this construct states that the individual must be able to assess barriers to the behavior change and be able to see a way to navigate around these barriers. If the barriers to

change are perceived as insurmountable then the change is unlikely to take place (Rosenstock, 1974).

The next constructs of the model were added when HBM was reassessed a decade after its original debut by Janz and Becker. They noted that additional constructs were needed to strengthen the model. One of those constructs was modifying variables or variables that affect the “priority of health in life” (Janz & Becker, 1984 p. 26). Modifying variables are those variables which can modify the effects of the original HBM model that had not originally been considered. Those variables may be culture, age, demographics, and socioeconomic status. Such variables were considered “barriers” in the original version of the model. Janz and Becker also noted the importance of cues to action which references the need for a trigger to engage an individual to begin the process of considering behavior. Finally, Janz and Becker also added the concept of self-efficacy to the model which is the recognition of the individual that he or she could change their behavior (Janz & Becker, 1984).

### **The Theory of Planned Behavior**

The Theory of Planned Behavior (TPB) is like the HBM in that it is a predictive model, but the TPB focuses more on how beliefs impact behavior (Ajzen, 1991). An individual’s beliefs may color some of their perceptions as applied to HBM. For example, a person’s beliefs based on their culture would apply to the modifying factors component of the HBM (Ajzen, 1991; Rosenstock, 1974). In addition, a person’s beliefs can have an impact on their perceived barriers as it applies to sexual health behaviors. Some religions, for example believe that the use of contraceptive use is inappropriate from a religious standpoint so they have may have a belief barrier preventing them from feeling able to utilize condoms to prevent STIs (Ajzen, 1991; Rosenstock, 1974). There are several tenants to the TPB. One is behavioral belief which is

associated with an individual's belief that there are consequences associated with a behavior and their belief about the potential consequences of the behavior then influence his/her willingness to engage in that behavior (Ajzen, 1991). This is like perceived susceptibility in HBM which is the notion that a behavior puts the individual at risk of a condition (Ajzen, 1991; Rosenstock, 1974). Another component of the TPB is attitude toward the behavior. This is the belief on the part of the individual about the value of the behavior (Ajzen, 1991).

Normative beliefs and subjective norms are both important components of the TPB. These are the individual's perception about whether a behavior is considered normal and/or acceptable to themselves as an individual and their partner and peers. Much like perceived barriers in HBM the TPB has a similar component which is perceived behavioral control which is the individuals' belief that he or she can easily perform a behavior and related to that is the control beliefs which are the individuals' belief about factors that might inhibit his/her ability to perform the behavior. The final components of the TPB is really where it steps ahead of the HBM in that it considers both behavior intention which is when the model predicts an individual to be ready to perform a behavior which in TPB directly precedes the actual performing of the behavior (Ajzen, 1991).

### **Nature of the Study**

The nature of this study is quantitative utilizing survey instruments. The first instrument to be used is the Condom Use Self-Efficacy Scale (CUSES) and permission has been obtained for its use in this study (see Appendix A). It was developed by Brafford and Beck (1991) and it was originally used to measure condom use intentions in young adults. It has been validated in recent studies as an effective means of measuring condom use intentions (Barkley et al., 2000; Forsyth et al., 1997). However, it is important to note that CUSES was not found to be reliable in

determining an individual's actual level of skill in using a condom compared to their perceived ability to use one properly (Forsyth et al., 1997). Barkley and Burns (2000) had noted a limitation of their study being that the population was largely Hispanic. For this study two social media platforms are being utilized to draw the sample.

The CUSES instrument is a 5-item Likert Scale survey tool with questions that address embarrassment associated with carrying and/or using condoms as well as intentions to use condoms based on perceived norms. The CUSES instrument can be found in Appendix B.

The second survey instrument Health Information National Trends Survey (HINTS) also has been tested in previous studies (Cantor, Covell, Davis, Park & Rizzo, 2005; Nelson et al., 2004) and is being used with permission (see Appendix C). The HINTS tool was developed by the National Cancer Institute (NCI) and is used to collect national data on American's use of cancer information. The HINTS tool will provide most of the information for analysis including demographic information, perceived susceptibility to STIs, and health information seeking behaviors (NCI, 2014). For this permission has been obtained to adapt the tool (see Appendix C) for use in measuring the same trends as they apply to STIs. The adapted survey for use in this study can be found in Appendix D.

A third instrument will be used to assess STI risk. This instrument was also obtained with permission from Marin County Health and Human Services in California. This is the survey instrument that is used in their STD clinics to assess risk of patients. The instrument was adapted for use in this study. Permission for use of this instrument can be found in Appendix E. The adapted version of the instrument is in Appendix F and the original is in Appendix G.

The participants were selected using self-selection via social media recruitment. The survey instruments were made available to interested individuals online where they were offered

information about the study and all informed consent documentation prior to administration of the surveys. They were asked to check a box indicating their understanding and consent after having reviewed the documentation. All necessary Institutional Review Board (IRB) approvals were obtained prior to any of the steps having been taken.

Independent variables for this study include:

- Age
- Sex
- Race/Ethnicity

Dependent variables for this study include:

- Sexual risk behaviors/Condom use behaviors
- Health information seeking behaviors
- Perceived susceptibility to STI infection

Sexual risk behaviors were measured using the CUSES which considers the intention to use condoms.

### **Definitions**

Some of the terms used in this study have variable meanings in other contexts or are not common knowledge. Those are defined below:

- **Social Determinants of Health:** as defined by the World Health Organizations Commission on Social Determinants of Health as the integrated factors such as social structures and economic systems that are the cause of most social inequality. These include the social and physical environment, health services and other societal factors. These social determinants are impacted by distribution of wealth, power, and resources at both the individual community and worldwide scales (WHO, 2008).

- Perceived susceptibility/risk: the notion on the part of an individual that he or she may be at risk of a outcome by engaging in a behavior (Rosenstock, 1974).
- Young adults: those between the ages of 20 and 29 years.
- Health Information Seeking Behavior measured using the adapted HINTS survey instrument.
- U.S. young adults: those who are United States residents between the ages of 20 and 29 years.
- Perceived susceptibility/risk as measured using the adapted HINTS survey (see Appendix C).
- STI/STD: Sexually transmitted disease/Sexually transmitted infection.

### **Assumptions**

For this proposed study, multiple regression analysis was used and the researcher assessed whether the assumptions of multiple regression were met. Details as to the methods of conducting that assessment are included in Chapter 3. For multiple regression, there are many assumptions. The first assumption of multiple regression is that the variables are normally distributed. The second assumption is that there is a linear relationship between the dependent and independent variables. Another assumption is little or no multicollinearity, which means that the test assumes that no variables in the model are highly correlated. Multiple regression also assumes that there is homoscedasticity or that all variables have the same variance (Pareonline, 2002).

### **Scope and Delimitations**

While the health belief model and the theory of planned behavior have several components the focus of this research was on perceived susceptibility. The reason for this focus

is that perceived susceptibility is hypothesized to have a direct relationship with health information seeking behaviors. Another delimitation of this study is that the population that was surveyed are U.S. young adults. This research is not intended to answer all associated questions, but to initiate the process of gaining a better understanding of health information seeking and STI risk behavior that may lead to future research and possibly educational programs.

### **Limitations**

This study, while using the guiding tenants of both the HBM and the TPB focused on the concept of perceived susceptibility as identified in HBM. Another limitation of this study is that it is a dissertation study meaning that there is some urgency in completing the work and very little funding for doing so which therefore reduces the scope as it can be applied. Since random sampling was not utilized because participants will self-select there is no way to control selection bias and as such representativeness will be assessed. The limitations associated with using self-selection could have been reduced using stratification by state education policy (i.e. abstinence only or HIV only policies). This has been taken under consideration for future research.

### **Significance**

As antibiotic resistance becomes increasingly problematic (Somani et al., 2000; Workowski & Berman, 2010) one of the ways in which this study is significant is that the focus is on prevention of diseases that contribute to the antibiotic resistance burden. At this time, there are few programs that offer a means of proactively providing education to young adults that could help reduce the burden of disease (Park, Mulye, Adams, Brindis & Irwin, 2006). Certainly, there are some awareness programs such as the CDC's STD Get Yourself Tested Campaign in April (CDC, 2015d), the Minnesota Department of Public Health has a program in which they push STD awareness on college campuses (Minnesota Department of Health, 2015) and there are

examples of other programs for young adults such as the SisterLove program which was designed for urban African American women in an effort to prevent HIV (Diallo, et al. 2010). However, despite the existence of awareness campaigns and these programs there is a prevailing lack of knowledge of STIs in general as well as a lack of knowledge of appropriate condom use for prevention of STIs (Friedman & Bloodgood, 2010). It has also been found that there is a lack of awareness about the availability of programs for STI prevention on college campuses as Trapasso (2005) identified when it was found that 50 percent of students at Northeastern University were unaware that condoms were provided for students or where they could go to get them. Therefore, programs themselves being available is not enough. There should be a proactive approach to making individuals aware of prevention programs and proactively offering prevention education (Reel & Hellstrom, 2013). In addition, as a contribution to social change this study could offer insight as to how to develop educational programs to do just that. In addition, should development upon this study lead to better educational paradigms we may be able to improve health education across the board in addition to sexual health education program.

### **Summary**

The rates of STDs in the U.S. have remained stable for the last decade at rates that are high enough for concern particularly for adolescents and young adults. While high rates of *Chlamydia* and *Gonorrhea* are enough to be concerned about, compounding that concern is the development of antibiotic resistance in both most common STIs; *Gonorrhea* and *Chlamydia*. There have also been resistance patterns noted in *Mycoplasma hominis*. Antibiotic resistance is a global trend with the WHO noting that high rates of resistance are being reported in common bacterium by all regions monitored. Resistance to third generation cephalosporin in *Gonorrhea* has been noted in 42 of the 194-member states reporting data to the WHO. This makes it more

important that public health professional's ways be found to reduce infection rates. Since there are educational and prevention tools in place for adolescents (though not for all adolescents) working toward improving what is available for adolescents is certainly important, but developing a more proactive focus on young adults is the next logical step. To do that it is necessary to understand how they seek health information to find the best means to reach out to them. It is also necessary to understand how their perception of risk influences their seeking of information.

## Chapter 2: Literature Review

### Introduction

The intention of this literature review is to go over the work in the last five years as it pertains to sexual education of young adults, investigations of sexual risk behaviors in young adults, use of the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) in relevant studies, the impact of antibiotic resistance on the fight against STIs, and research that has been conducted on health information dissemination and health seeking behaviors in the same demographic.

One of the single most complex public health topics is antibiotic resistance in infectious diseases. It was not long ago that public health professionals were praising antibiotics and the eventual eradication of bacterial infections as a result. According to the CDC *Gonorrhea* has demonstrated resistance in strains to several different antibiotics. (CDC, 2013a). *Chlamydia* is the most commonly reported STI in the United States (Torrone, Papp, Weinstock & CDC, 2014) and has also demonstrated resistance to numerous antibiotic therapies (Somani et al, 2000). Sexually transmitted diseases (STI) are preventable with precautions such as the use of condoms and reducing the number of partners (CDC, 2015a). Part of the challenge then, is to understand the population in which the problem exists and to then find a way to communicate with them and deliver health information that can lead to a change in behavior. To do that the beliefs associated about that behavior and where those beliefs find their footing need to be understood (Royer, Heidrich & Brown, 2012).

The sources used included: Medline with Full text, CINAHL Plus with Full text, ProQuest Nursing and Allied Health Source, Health & Medical Complete, CINAHL and MEDLINE Simultaneous search, PubMed, Science Direct, PsycINFO, and Google Scholar.

Keyword searches used individually or in various combinations were: *sexually transmitted diseases, sexually transmitted infections, young adults, health belief model, theory of planned behavior, sex education, perceived susceptibility, perceived risk, sexually transmitted disease and social determinants of health, sexually transmitted disease and socioeconomic status, antibiotic resistance, racial disparities and ethnic disparities*. Emphasis was placed on studies conducted between 2010 and 2015 while older studies were used where appropriate to abide by the Walden University policies of using only peer-reviewed literature published in the last 5 years except for literature for the conceptual framework chosen. All studies reviewed were in English.

In this chapter, a review of the literature pertaining to the application of the health belief model and the theory of planned behavior as applied to STIs as well as an overview of the burden of STIs, antibiotic resistance in STIs will be covered. In addition, this chapter will address the literature pertaining to sexual health related behavior in young adults, sex education, and social determinants of health.

### **Theoretical Framework**

In the development of intervention programs for sexually transmitted diseases the Health Belief Model (HBM) has been used to understand sexual behavior patterns and how to address changing such behavior (Diallo et al., 2010). The HBM focuses on the precursors to behavior change, but does not accurately predict the actual initiation of behavior change or sustainment of such change (Carpenter, 2010). For that reason, researchers have focused on combined models that pair the HBM with other theoretical models that more effectively address those areas where HBM is lacking (Carpenter, 2010). This will be done here for that reason. In tandem with the HBM this research will also use the Theory of Planned Behavior (TPB) as a guide. The TPB

considers beliefs and behavior which is something that the HBM does not effectively address on its own (Carpenter, 2010; Diallo et al., 2010). Beliefs can be impacted by culture, socioeconomics, and social norms which are all important aspects of the ability and willingness of an individual to engage in behavior change (Cheney et al, 2014).

### **Health Belief Model and Sexual Health in Young Adults**

The HBM has been used to make judgements about sexual risk behaviors including condom self-efficacy (Reid & Aiken, 2011) and intentions to use condoms (Montanaro & Bryan, 2014). The model relies on several tenants the first of which is perceived susceptibility (often also referred to as perceived risk) which is the notion that the individual(s) is at risk of the condition. The second tenant is perceived severity which is the notion that the condition is severe enough to warrant preventative behavior change(s). Third, perceived benefits or the individual's notion that there are significant benefits to engaging in behavior change(s). Fourth, perceived accessibility or the notion that changing the behavior is an accessible goal without extensive barriers (Rosenstock, 1974). Finally, modifying factors such as socioeconomic status, culture, and religion that can impact a person's willingness to engage in behavior change. Modifying factors was added to the model later than the previous tenants after the realization that such factors are important in predicted behavior (Janz & Becker, 1984). It is worth noting that modifiable factors as identified by Janz and Becker (1984) are not meant to imply that the factors themselves can be modified, but that factors such as culture, religion, and socioeconomic have modifying effects on the other components of the HBM.

It is well understood that to influence human behavior the reasons behind specific behaviors should also be well understood. When it comes to influencing sexual behaviors that is also an important element. Research has shown that there is a lack of true understanding of STIs

(Anwar, Sulaiman, Ahmadi & Khan, 2010). While there is some familiarity with STIs there are common problems with individuals truly understanding their risk. Surveys have shown, for example, that most young adults have a higher perceived susceptibility to HIV than to other STIs even though the public health community knows that rates of STIs like *Chlamydia* and *Gonorrhea* are much higher (CDC, 2014b) than rates for HIV (CDC, 2015a). Part of this may be that there is simply a greater awareness and understanding of HIV than other STIs or the perception that STIs are not serious health conditions (Samkange-Zeeb, Pöttgen, & Zeeb, 2013). According to East, Jackson, Peters and O'Brien (2010) it is more complicated than simply focusing on encouraging condom use because there are so many reasons why an individual may choose not to use them that go far beyond aesthetics or perceptions associated with condoms (Bolton, McKay & Schneider, 2010). Take, for example, the importance of self-image and the perceptions individuals have of those who contract STIs. If an individual perceives those people with a history of STIs in a bad light, but they themselves have a positive self-image then that individual may then not perceive a risk to STI infection regardless of their own risk associated behaviors (East et al., 2010). One important potential element to preventing STI infections and promoting safe sex may be destigmatizing those with a history of infection (East et al., 2010). However, there is a fine line between destigmatizing those who have had an STI in the past and avoiding all negative connotations associated with STIs. Public health professionals do not want to make it appear individuals with a history of STIs are in some way lesser, but also do not want to lessen the impact of the message that certain behaviors are dangerous and that STIs can be detrimental to health. It is an incredibly complex issue that public health professionals do not entirely understand.

Research conducted has found that perceived susceptibility is an important factor in whether individuals engage in preventative behaviors (Crosby et al., 2014). In a survey study of STI clinic patients Crosby et al. (2014) found that for those individuals that thought their most recent partner may have put them at risk reported having used condoms based on that perception of risk. Those individuals that thought they may have been infected during their last encounter also reported using condoms considering that perception. This led to their conclusion that perceived susceptibility to infection with an STI during intercourse or passing on an STI was a significant predictor of condom use. Those findings were supported in another study considering the use of condoms and association with perceived susceptibility in female Marines where low perceived susceptibility was statistically significantly associated with low rates of condom use (Pollack et al., 2013). The level of partner trust and/or perception of an individual's own risk behavior as far as what might influence an individual's condom use.

It has been noted, however, that the HBM alone is not ideal for predicting health behavior change alone (Montanaro, & Bryan, 2014). For that reason, the Theory of Planned Behavior (TPB) will be used in conjunction with the constructs of the HBM. Researchers have been focused of late on the ability and utilitarian nature of combining different models and their constructs to make a stronger predictive health model. Reid and Aiken (2011) considered the functionality of combining HBM and TPB, along with three other models so combining theoretical frameworks is not new.

### **Theory of Planned Behavior and STIs**

The Theory of Planned Behavior (TPB) is an extension of the Theory of Reasoned Action (TRA) that considers the link between behavior and belief (Ajzen 1991). The theory has been applied widely in many disciplines including healthcare. The common thread between the

TRA and the TPB is the concept of attitudes and subjective norms. Subjective norms relate to an individual's perception of what others consider normal which, in the TPB is called normative belief and based on what is considered normal an individual identifies a social norm that then leads to their thoughts on in terms of whether that behavior should be engaged in (Ajzen, 1991). For example, an individual is less likely to use condoms if his/her attitude toward condoms is that they are not considered acceptable to his/her peers and/or that they are interruptive. Peer pressure is often a significant contributor to social norms along with factors such as culture, religion, rules, and expectations (Cheney et al., 2014). Other components of the TPB behavioral beliefs, perceived behavioral control, control beliefs, behavioral intention, and actual behavior. The behavioral belief is like the HBM concept of perceived severity in that the behavioral belief is an individual's belief that the behavior that they are or are not engaging in has a consequence (Ajzen 1991, Ajzen, 2002; Prati, Mazzoni & Zani, 2014). Perceived behavioral control is an important element of the TPB because this element, much like perceived barriers in the HBM, is the individual's perceived ease of adapting to or halting a behavior. Unlike the HBM this concept is considered more all-inclusive in the TPB in that beliefs and norms are considered significantly impactful to the perceived behavioral control component. Also unlike the HBM the TPB carries through to the actual initiation of behavior change. The behavioral intention component is the point at which the individual shows willingness to engage in behavior change. This is considered the state that immediately precedes that behavior change. Finally, the behavior component is when the model observes a measurable behavior change (Ajzen, 2002).

The TPB has been utilized in the past to address sex education and STI prevention. Recent work includes using the TPB as a basis for the development of education programs for

adolescents (Jemmott, Jemmott, & Fong, 2010a; Jemmott, Jemmott, Fong & Morales, 2010b). One such program used two different educational programs, one was abstinence only, and the other was a comprehensive sex education program. The abstinence only program did not show any significant impact in condom use, but did find that their participants were less likely to engage in sexual intercourse. The comprehensive program did lead to a reduction in reports of multiple partners. In fact, they found that in the 2 year period following the abstinence only intervention there was a reduced rate of sexual initiation (risk ratio [RR], 0.67; 95% confidence interval [CI], 0.48-0.96) and that participants were also less likely to have engaged in sexual intercourse over the same period (33.5% for the experimental group versus 48.5% in the control group) and 20.6% of the participants were reported as having engaged in sexual activity in the 3 month follow-up period versus 29% for the control group (RR, 0.94; 95% CI, 0.90-0.99). Overall, the researchers found that utilizing theory to develop intervention programs could be important for adolescents (Jemmott et al., 2010a) and similar studies have found that comprehensive educational interventions can be beneficial in increasing safe sex behaviors in adults (Sakha, et al., 2013). Another intervention program that was designed using the TPB as the foundation considered the use of community based organizations as a tool for delivering HIV/AIDS intervention programs and showed that this strategy was very successful (Jemmott et al., 2010b). Boudewyns and Paquin (2011) utilized the TPB to determine the beliefs associated with the intention to get tested for STIs. Under the tenants of the TPB they wanted to better understand which beliefs were significantly associated with intention to recommend communication strategies. In their sample of 181 participants they found that the two beliefs that significantly contributed to condom use intention were to demonstrate respect for his/her partner or to avoid spreading an STI to someone else. While their study contributes more to an

attempt to get more people to get tested for STIs the application of the TPB and the focus on beliefs and attitudes could logically be utilized to better understand condom use, health information seeking behavior and risky sexual behavior as they are associated with beliefs and attitudes in young adults.

Online tools have been a popular point of research in the last several years with internet interventions being used to target several different groups (Hightow-Weidman, et al., 2011) and it has been shown that the very nature of being able to be more anonymous using an internet intervention has made them successful. However, assumptions about the preference of anonymity in place of speaking to a physician should be assessed at a community level as many factors can determine the overall effectiveness of the use of such sources (Labacher & Mitchell, 2013). While it should not be assumed that such sources are preferred there is something to be said about the importance of learning how to utilize media sources as health dissemination tool given the fact that studies estimate as much as 60 percent of health-related research is done on the internet (Thackeray, Crookston, & West, 2013).

### **Overview of the Burden of STIs and Surveillance**

In the United States in 2013 there were over 300,000 cases of *Gonorrhea*, just over 1.4 million cases of *Chlamydia* which are the two most common STIs and will be the focus here. This represents a significant decrease in incidence rates of *Chlamydia* and a slight decrease in incidence rates of *Gonorrhea* compared to the previous year, but the incidence rates are still high particularly when looking at the trends in the as presented in Figure 1 (CDC, 2014b). Note that the most recent incidence rates for *Chlamydia* are nearing the highest rates ever seen for *Gonorrhea* and those rates for *Chlamydia* have been on a steady rise since 1984. Increasing incidence of *Chlamydia* could be the byproduct of more effective screening programs, better

technologies, and increased reporting rates over time (CDC, 2014f). *Gonorrhea* has been monitored in the U.S. since 1941 while monitoring of *Chlamydia* did not begin until 1984 which is why the rate of *Chlamydia* does not begin to climb in Figure 3 until then (CDC, 2014b).

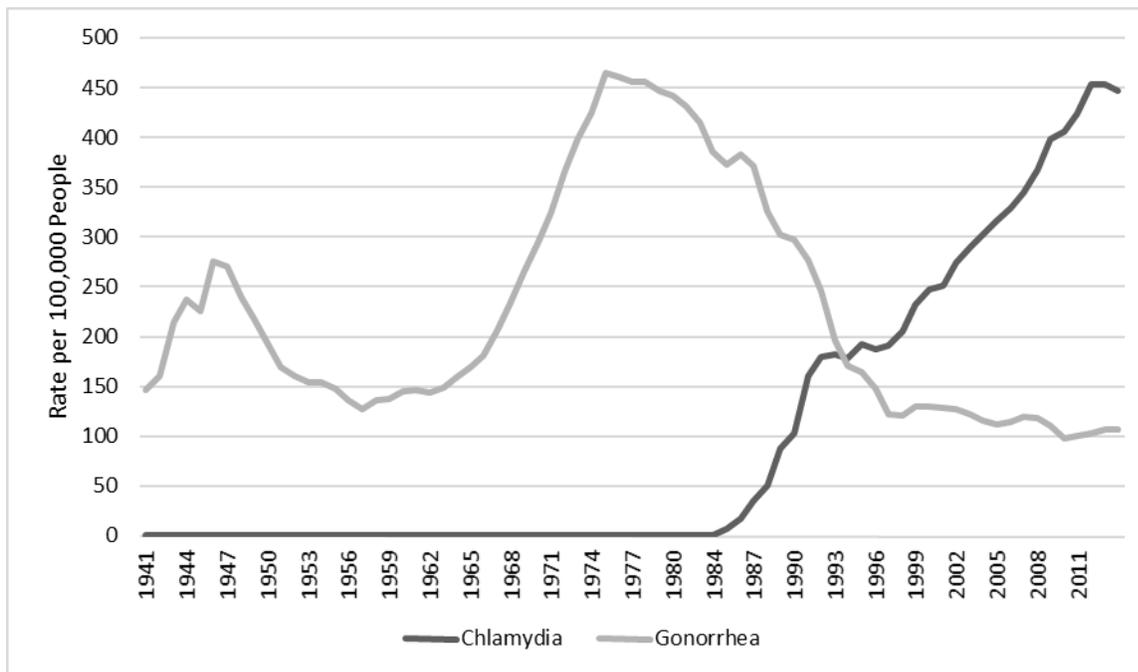


Figure 3. Line graph showing rate trends from 2003 to 2013 for *Chlamydia* and *Gonorrhea*. (CDC, 2014e)

Note: *Chlamydia* reporting began in 1985, but cases were present before that time.

*Chlamydia* which is caused by *Chlamydia trachomatis* is the most common STI.

According to the CDC there were 787,087 cases of *Chlamydia* in adults aged 20-29 in the U.S. for the year 2013 for a rate of 1789.58 per 100,000 people (CDC, 2015c). The cost estimate of all STIs in the United States is approximately 19.7 million dollars (Owusu-Edusei et al., 2013). In the United States, the rates for STIs also demonstrate racial/ethnic disparities with the rates among African Americans being more than ten times higher than that of Whites for *Gonorrhea* and more than five times higher in African Americans compared to Whites for *Chlamydia*.

There are also marked differences when comparing Whites and Hispanics (CDC, 2014a; CDC, 2014c). These disparities are presented in Figure 4.

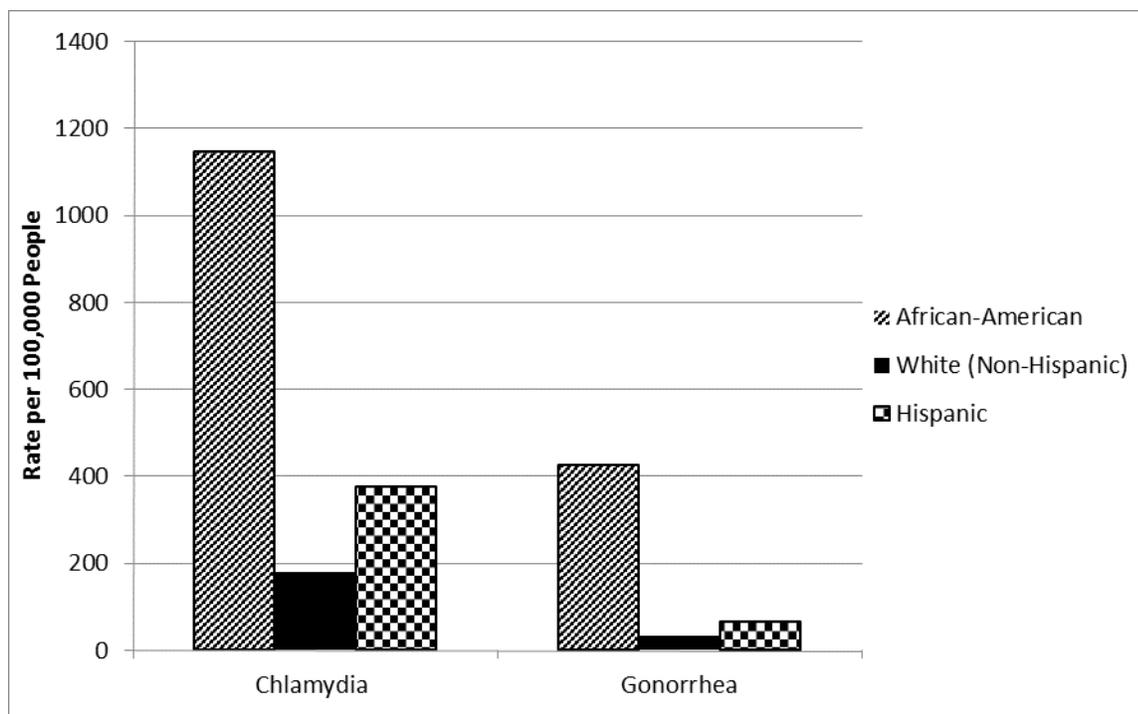


Figure 4. Bar graph displaying differences in incidence rates for African Americans, Whites, and Hispanics. (CDC, 2014c).

Studies have shown that in smaller minority populations in the U.S. there are still disparities that are not explained by behavior alone (Eitle, Greene & Eitle, 2015; Harling, Subramanian, Bärnighausen, & Kawachi, 2013). This accounts for a very large disease burden for something that can be prevented. What the public health community knows about the burden of risk related behavior that increases the chances of contracting STIs is often based on self-report which research has found to be problematic as there are discrepancies between the diagnoses and self-reported abstinence for individuals testing positive for STIs (DiClemente, Sales, Danner, & Crosby, 2011). For *Gonorrhea* and *Chlamydia*, the current method of treatment is a dose of antibiotics (CDC, 2015b). The CDC has changed its recommendations

for treatment of *Gonorrhea* from a single dose of antibiotics to a dual treatment method given the speed with which resistance has developed (CDC, 2015b).

In the U.S. *Gonorrhea* is of concern due to its developing resistance to antibiotics (Bradshaw et al., 2006). While *Chlamydia* and *Gonorrhea* are the most well-known of STIs there are numerous other infections that are spread through sexual contact (Workowski & Berman, 2010). A study in Zimbabwe (Kurewa et al., 2010) sought to understand the burden of STIs in a very specific cohort, pregnant women (N=691). In their study, they found that over 50 percent of participants were positive for STIs and even more (64 percent) had reproductive tract infections (RTI). In Zimbabwe, the trend for the age of women that were most associated with these infections was different than in the U.S. because women over the age of 30 were more likely to have an STI. There was a correlation noted to multiple partners and substance use among the women and their partners (Salameh et al., 2015; Canchihuaman et al., 2010).

### **Antibiotic Resistance and STIs**

STIs, like any other bacterial organism have the potential to develop resistance to antibiotics. This is problematic for public health (Trecker et al., 2014). At present, the greatest concern is the development of resistance to treatment in *Gonorrhea*. *Gonorrhea* has demonstrated ability to adapt and change in response to environmental and develop resistance to treatment (Unemo & Shafer, 2011). Most recently this has been seen in specific risk groups such as men having sex with men (MSM) and sex workers and has shown further development of resistance since then (Lewis, 2013). It is currently resistant to oral and injectable cephalosporins (Ison et al., 2013). What is less known is that *Gonorrhea* is not the only STI developing resistance to treatment, even though it is the most alarming (Bradshaw et al. 2006). Both *Chlamydia* and *Mycoplasma hominis* are displaying resistance to antibiotics. While there

is little known yet in terms of the level of resistance studies have shown that *Chlamydia* strains are demonstrating resistance multiple antibiotics (Bradshaw et al. 2006).

## **Sexual Behaviors in Young Adults**

### **Condom Use Behaviors**

Young adults demonstrate high rates of STIs among all demographic groups (CDC, 2014d; CDC, 2014e). Part of this is due to the lack of understanding among young adults as to the appropriate methods of prevention and their individual risk factors (Royer et al., 2012). A method of addressing this burden is through education that encourages safe sex practices and prevention rather than only encouraging screening and treatment. Encouraging the use of condoms is a commonly recommended method of preventing STIs and understanding attitudes toward condom use is an important part of being able to effectively encourage their use (Protogerou & Turner-Cobb, 2011; Camara et al., 2010). The importance of condom use for the prevention of STIs makes condom use self-efficacy an important thing for public health professionals to understand. Wang (2013) conducted a study examining condom use intentions among US college students with specific attention to the role of efficacy, emotions, and relationship status. Attention was paid to qualifying college students in the Northeastern US, and of the 4,500-person population 902 completed the survey. Only heterosexuals were included in the study and a Likert scale survey was used to for measurements. For the women in the sample relationship status ( $B = -0.76$ ,  $p < .001$ ), and sexual sensation ( $B = -0.21$ ,  $p < .01$ ) was negatively predictive of condom use intentions. However, condom communication efficacy was positively predictive of intentions to use condoms ( $B = 0.36$ ,  $p < .001$ ). Among the males in the study, stronger perceptions of subjective norms ( $B = 0.50$ ,  $p < .001$ ), condom communication efficacy ( $B = 0.38$ ,  $p < .001$ ) and strong anticipated emotions ( $B = 0.24$ ,  $p <$

.001) were all positively predictive of condom use intentions. Thomas et al. (2015) conducted a study on emerging adults between 18 and 24 years of age in the Southeastern United States who were recruited from health centers at their universities. Their study examined condom use self-efficacy using the Condom Use Self Efficacy Scale (CUSES). The average CUSES score for all participants was 113.47 (SD = 17.92, Range = 41–140) with higher scores indicating higher rates of knowledge and self-efficacy of condom use. Those individuals categorized as “other” (i.e., those that did not identify as Caucasian, African American, Hispanic, Asian or identified as multiracial) had the highest score of 121.39 (SD=13.5). African-Americans followed with a score of 117.6 (SD=22.8). Whites mean scores were close with that of African-Americans at 116.9 (SD=14.0) and Asians had the lowest mean score with 108.6 (SD= 18.9). This indicates that education interventions have a positive effect on condom use self-efficacy.

Attitudes toward condoms can be variable and may need addressing. Attitudes can be impacted by social norms (or perceived social norms), perception of partner trustworthiness, condoms negative impact on pleasurable sexual encounters (Higgins & Wang, 2015). High rates of STIs among young adults are correlated to early initiation of sexual activity and lowered perceived risk, lowered rates of condom use, and higher probability of multiple partners (Li et al., 2015; Aral & Leichliter, 2010; Kershaw, Arnold, Gordon, Magriples, & Niccolai, 2012).

Several studies have considered issues like condom use self-efficacy and on better understanding male and female preferences toward condom use (Tang et al., 2013) and found that sexual risk behaviors are associated with more than just preferences toward use of condoms. One study examining illicit substance use recruited heterosexual African American men and women newly diagnosed with HIV (case) and compared them with randomly selected

heterosexual African American men and women from the general population (control). Within the case group 38 percent of males and 30 percent of females reported substance abuse compared to 5 and 9 percent respectively for controls. In addition, lower education levels were associated with higher likelihood of a positive diagnosis of HIV with 44 percent of males and 39 percent of females reporting less than a high school education compared to 17 percent for both males and females in the control group (Doherty, Schoenbach & Adimora, 2009). The surveys in this study will consider condom use self-efficacy, STI history, substance abuse, education, socioeconomics, and health information seeking behaviors.

In addition, in a study conducted by Bersamin, Paschall, Saltz, and Zamboanga (2012) college students also demonstrated increased sexual risk behavior such as engaging in sex with strangers when drinking (OR=1.61; 95% CI=1.34, 1.94) particularly in certain social settings and those who reported having sexual intercourse in the past semester/quarter (OR = 23.77,  $p < .01$ ). In their study, they calculated odds ratios to determine the association between a activity and the likelihood of intercourse with a stranger. Greek parties were the event most associated (OR=10.09; 95% CI= 4.54, 22.40) followed by residence hall events (OR= 4.96; 95% CI= 2.10, 11.67), campus events (OR=0.88; 95% CI= 0.22, 3.49), unspecified off-campus events (OR=4.92; 95% CI= 2.23, 10.86) and restaurant/bar events (OR=2.04; 95% CI= 0.85, 4.89), Crosby & Shrier (2013) found that risk factors for contracting *Chlamydia*, *Gonorrhea*, and/or *Trichomonas* included having a partner with a history of incarceration as 34.7% of participants who stated having sex with a recently released prisoner tested positive for an STI compared with 17.5% among those who did not ( $p = .002$ ; 95% CI 1.32,2.99). Khan et al (2011) found that of the 343 participants in their study 45% had a history of incarceration. Of that 45% only 13% had been incarcerated for less than 1 year and 33% had been incarcerated for a year or more.

Additionally, 55% of participants reported intercourse in the previous 3 months with an individual who had a history of incarceration. 56% of all participants reported infection with either HIV (11%), Herpes simplex virus-2 (50%), *Chlamydia* (6%), *Syphilis* (3%) or *Gonorrhea* (1%). Women were found to be more commonly infected with an STI (prevalence ratio=1.29; 95% CI=1.06, 1.59) when compared to men in the sample. Additionally, age was a predictor of STI likelihood with those 25 years or older being 1.5 to 2 times more likely to be infected than those 18 to 24 years of age and non-injection drug use was a significant predictor of HIV or STI infection (prevalence ratio=1.27; 95% CI 1.05, 1.54). Though their sample size of 139 was small Swartzendruber, Brown, Sales, Murray & DiClemente, (2012) noted similar findings among those with incarceration histories. For those that were recently released partner they had increased odds of contracting *Chlamydia* (AOR: 1.80, 95% CI: 1.14, 2.85) in addition to increased odds of contracting other STIs (AOR: 1.61, 95% CI: 1.06, 2.45). There were also increased odds of individuals with a recently released partner to have engaged in other risky sexual activity such as casual sex (AOR: 1.66, 95% CI: 1.11, 2.49) or sex while being themselves inhibited by alcohol or drugs (AOR: 1.57, 95% CI: 1.02, 2.44). There were also increased odds that their partner was inhibited by alcohol or drugs during sexual encounters (AOR: 2.27, 95% CI: 1.57, 3.27). In addition, other risky sexual behaviors were inconsistent condom use (AOR: 0.58, 95% CI: 0.35, 0.94) and emotional (AOR: 4.09, 95% CI: 2.11, 7.92), physical (AOR: 2.59, 95% CI: 1.23, 5.45) and/or sexual abuse (AOR: 4.10, 95% CI: 1.39, 12.13) by a partner.

The World Health Organization (2007) has made a point to state that a priority for addressing STIs is to address gender inequalities associated with STI risk. Raiford, Seth and DiClemente (2013) examined the relationship imperative among females and the association

with STI risk. The issue of the relationship imperative identified in this study was that the young women in the sample population placed more value on their relationship than they did on their own health and welfare. Among 715 young African American women were included in the sample and it was found that 47.8% lived in households on public assistance and 50.6% were in relationships with men who were 5 or more years older than they were. Most (83.6%) of the young women were in relationships and 29% of them considered a relationship imperative to their sense of self. This signifies that they would engage in risky behaviors to protect that relationship. Those women that considered the relationship imperative were had higher odds of having less power in their relationship (AOR=2.3), less ability to refuse sexual advances from their partner (AOR=2.0) and less ability to negotiate condom use (AOR=1.5). Partner abuse was also of higher odds to young women who considered the relationship imperative with increased odds of recent abuse (AOR=1.6) or lifetime abuse (AOR=1.5). They were also at higher risk of having had unprotected sex prior to an STI diagnosis (AOR=3.9). In data collection information about the relationship imperative will be considered with questions about relationship status, self/partner incarceration, and domestic abuse histories.

Some studies have supported that substance abuse increases the risk of sexual risk behavior such as Khan et al, (2011) who noted an association between substance abuse and STI risk. Doherty et al. (2009) found that of their sample of 156 men (78 cases and 78 controls) and 276 women (128 cases and 148 controls) a greater percentage of HIV risk behaviors were noted when using cocaine (31% for cases and 5% for controls) and binge alcohol use (26% for cases and 12% for controls). There are other studies that have not supported that such as Calsyn, Baldwin, Niu, Crits-Cristoph and Hatch-Maillette (2011) who studied the differences in sex risk behavior when under the influence and found that safe sex was not more likely when under the

influence than it was when not under the influence. There were limitations to this study however, including no control group and a small population and thus the findings may not be generalizable. Of their participants 48.3 (p=0.82) percent reported that they were not under the influence when they decided to engage in safe sex and 49 percent (p=0.82) were under the influence when they made the choice to engage in safe sex. This may mean that the issue is more multifaceted and other variables such as the availability of condoms, mood, arousal, likelihood of intercourse, and level of impairment at play have a larger impact (Gilmore et al., 2015). The intention to use condoms is something that is oft studied and have found that condom use is typically inconsistent among the young adult demographic. In one such study Thomas et al. (2015) examined condom use behaviors and found that of the 335 participants 30.2 percent reported never having used condoms and 47.7 percent revealed inconsistent condom use and only 22.2 percent of those participants reporting regular condom use (Thomas et al., 2015). However, de Vet et al. (2011) found that when individuals had a plan to implement condom use they were more likely to engage in condom use. They discovered that intention alone was not a solid predictor of actual condom use, but that preparatory behaviors such as making a point to have condoms available in the event of their need was better associated with intention and did more often result in actual condom use (de Vet et al., 2011). Social norms have also been shown to be a significant predictor of an individual's willingness to use condoms (ten Hoor et al., 2013). Condom use is also much more typical when they are readily available supporting the notion that having a plan is an important step (Tafari, Martinelli, Germinario, & Prato, 2010).

### **Attitudes about Condom Use in Young Adults**

Hill, Amik, and Sanders (2012) used the Brief Condom Attitude Scale (BCAS) which measures intentions with higher scores indicating lower rates of condom use intention. The

scale is designed to be gender neutral. It is an 18-item Likert scale with rankings of 1 to 5. Lower scores are representative of higher intention to use condoms and higher scores of lower intentions. While women in the survey seemed to have better views on condoms the intention to use them was not necessarily associated with actual use particularly dependent on the type of relationship (casual relationships resulted in higher condom use intention than long-term monogamous relationships). Men were found to think that the use of condoms is an impediment to intercourse and have an overall negative view of condoms with a BCAS score of 3.45 compared to women with a score of 3.19 ( $p > 0.001$ ) (Hill et al., 2012). The Multidimensional Condom Attitudes Scale (MCAS) is a tool that was developed by researchers at the University of California Los Angeles (UCLA). Several studies were conducted to develop the tool that would measure condom use attitudes and variables that impact condom use intentions. It is a 15 page, 187-item questionnaire that was developed to measure condom use and self-efficacy behaviors (Helweg-Larsen & Collins, 1994). Starosta, Berghoff, and Earleywine (2015) conducted a more recent study using the MCAS further validating it as an effective tool in measuring condom use attitudes. A study conducted in China by Tang et al. (2013) found that college students in China demonstrated increasing incidence of premarital sex and a significant rate were found to engage in unprotected sex due to a low understanding of the risks associated with such sexual behaviors. Of the students surveyed 82.5 percent were of the belief that condoms are the most effective way to prevent STIs while 17.5 percent did not. Even with that belief less than 20 percent of those surveyed reported using condoms when they first initiated sexual activity and only 69.8 percent reported regular condom use while 30.2 percent reported seldom using them (Tang et al., 2013). Even for those individuals where condom use is reported during previous encounters that may not indicate appropriate levels of

STI protection due to ineffective use of condoms (this study focused on condom breakage, condom slippage, condom-related erection loss, and delayed condom application). Some studies have shown lack of knowledge on the effective use of condoms with reports of breakage, slippage and other problems associated in use errors which then lead to a risk of STI transmission. In addition, individuals who had reported condom use did not always use a condom for the entirety of penetrative intercourse leading to further potential for exposure to STIs (Baćak & Štulhofer, 2012). Even in populations where knowledge of STIs and the appropriate preventative measures is high there can still be a problem with risky sexual behavior (defined by the authors as having casual sex, inconsistent condom use and engaging in sex with sex workers) indicating further the complexity of the issue (Orisatoki & Oguntibeju, 2010).

It is estimated that nearly half (48%) of 17-year olds report having been sexually active and more than half of 18-year olds (61%) report sexual activity (Finer & Philbin, 2013) it can be assumed that most young adults are likely sexually active. Therefore, focus on behaviors like consistent condom use are an important part of this study because condom use is the next best way (to abstinence) to prevent the contraction and spread of STIs (Holmes, Levine & Weaver, 2004). Other means of prevention are mutual monogamy and reducing the number of sexual partners (Mojola & Everett, 2012). It is important to understand condom use behaviors on the demographic of interest because condom use behaviors can aid in determining how susceptible to STIs an individual might feel. It can also lend an understanding as to how much individuals know about STI prevention.

## **Social Factors in Sexual Risk Behavior**

Culture, social structure, gender, race/ethnicity, family dynamics are all important factors that can impact sexual risk behavior. Recommendations have been made to tailor sex education programs to specific racial and ethnic groups that demonstrate higher STI rates such as African Americans and Hispanics because of their increased odds for STI contraction (Dariotis, Sifakis, Pleck, Astone, & Sonenstein, 2011; Diallo et al., 2010; Pflieger, Cook, Niccolai & Connell, 2013; Kogan et al., 2010). That rates of STIs in the US are highest among Hispanics and African Americans and highlights the need for additional studies on condom use behavior (CDC, 2011) Dariotis et al., 2011 conducted a study that followed adolescent men in the transition to adulthood. They conducted a three-wave sample, the first wave comprised of adolescents up to 19 years of age with a mean age of 16.9 years (N=1,880). The second wave of males aged 17-22 years (N=1,676) and the third wave of males aged 21-26 years (N=1,377) and they note an oversampling of African American and Latino males. They used a weighted analysis to calculate the racial/ethnic distribution and stated that approximately 15 percent of their sample population identified as African American, approximately 75 percent as White, and 10 percent as Latino. They found that for their population even when controlling for some socioeconomic variables African American men were still more likely to have a history of STI diagnosis than their Latino or White counterparts with no significant disparities between Whites and Latinos. This was although African American males were of the low risk - high protection (high condom use) group. Condom use was also found across groups to decrease with age and in long-term monogamous relationships.

In a study examining the effects of a single session HIV prevention program with a female population focus Diallo et al (2010) utilized some pre-existing groups of women whom

had participated in the SisterLove program which is an HIV intervention prevention program designed to women in metropolitan Atlanta. The participating women were required to be at least 18 years of age and not pregnant or soon to be pregnant as the study period ran for one year. Women were then randomly assigned to either the single session intervention program or a comparison group program that was less interactive. The single session intervention program was designed using tenants of the HBM, the Transtheoretical Model, and Social Cognitive Theory. It was an education program designed to provide information to change behavior patterns that were considered risky (i.e., multiple partners, lack of condom use) and there were 313 women enrolled in the study. At the 3-month follow up period there was a significant increase in condom use during heterosexual intercourse (adjusted odds ratio = 2.40; 95% CI = 1.28, 4.50) as well as an increase with significant others (adjusted odds ratio = 2.87; 95% CI = 1.18, 6.95). The rates of condom use were not as high at the 6-month follow up period (adjusted odds ratio = 1.50; 95% CI = 0.83, 2.72), but they remained protective at that time.

Reece et al (2010) conducted a study that was nationally representative with a sample size of 5,685 U.S. adolescents (N=820) and adults (N=5,045) from the National Survey of Sexual Health and Behavior (NSSHB). They sought to understand condom patterns across age groups and assessed condom use patterns by querying about their last 10 instances of intercourse. They found trends in condom use by age, gender, and relationship status. Variation was found among different age groups in this study. When intercourse was with a monogamous relationship condom use was reported more often than in casual sex encounters. Among the 14-17-year-old male demographic condom use was reported in relationships 76.3% of the time (95% CI=60.6-87.2%) and 84.2% of the time in casual encounters (95% CI = 61.6-95.3%). For females in the 14-17-year demographic condom use was reported in relationships 63.2% (95%

CI=47.5-76.6%) of the time among and 88.9% of the time in casual encounters (95% CI=66.7-98.0%). Among young adult males in the 18-24-year-old male demographic it was reported 22.2% of the time (95% CI=8.5-45.7%) and among females 20% of the time (95% CI=7.5-42.2%). In casual encounters 18-24-year-old males reported condom use 46.9% of the time (95% CI=37.3-56.7%) while females reported condom use in casual encounters 31% of the time (95% CI=21.8-42.0%). This study did examine condom use all the way through seniors, but for the purposes here only up to the 25-29-year demographic is being highlighted for this study. Among 25-29-year-old males within a monogamous relationship condom use was reported 19.8% of the time (95% CI=13.4-28.2%) and among females in the same demographic 19.4% reported condom use (95% CI=13.3-27.3%). In casual relationships 25-29-year-old males followed the trends of increased frequency of condom use in with 53.1% (95% CI=39.4-66.3%) reporting condom use in those instances and females reported a similar increase in condom use with 41.5% (95% CI=31.4-52.3%) reporting use.

While Diallo et al. (2010) had a very specific population focus making the study less generalizable Pflieger et al. (2013) utilized a nationally representative population (n=7,015) that was female focused. They examined the odds of STI contraction in African American, Hispanic, and White women. Eight items were used to determine the odds of contracting an STI which were number of vaginal sex partners (last 6 years), number of oral sex partners (last 6 years), history of anal sex (last 6 years), number of concurrent partners (last 6 years), knowledge of partner STI status (last 6 years), number of vaginal intercourse partners (last year), number of unprotected sex instances (last year), and age at sexual initiation. In this study, they determined three classes for Hispanic women. The first class were the recent abstainers who had not engaged in intercourse in the prior 12 months and limited intercourse over the last

6 years (24.9%). Moderate risk classes were those in single partner relationships in the last year with limited activity in the prior 6 years (48.5%). The third class was the high-risk class with higher rates of oral, vaginal, and anal intercourse as well as multiple partners and inconsistent condom use (26.7%). Among White women there were four classes due to the addition of the low risk class. The first class was the same—recent abstainers—which was 18.8% of White female participants. The low risk class was defined as single partnership in the last 6 years and while condom use rates were low the partners were also considered low risk (21.6%). For White women 38.1% fell into the moderate risk category and 21.6% into high risk. African American women, like Hispanics, fell into the three-category classification with 16.8% as recent abstainers, 55.2% as moderate risk, and 28% as high risk. Their final analysis for this study was to determine the level of STI infection in their participant group. Of those who self-reported 29.3% of African American women reported an STI infection along with 10% of Hispanic women and 6.1% of White women.

Parental involvement in safe sex education has been found to be an important step in increasing STI prevention behaviors. Bradley, Leichter and Gift (2013) found that women who used another form of contraception to prevent pregnancy were less likely to use condom during intercourse. In their group of 564 women who used another form of contraception only 42% reported condom use ( $P < 0.01$ ) whereas the group of 642 of the women who did not use another form of contraception 64% reported condom use ( $P < 0.01$ ). For African American women, it has been found that parental strategies have a strong impact on women as they enter adulthood and develop their abilities to manage power dynamics in relationships (Kogan, Simons, Chen, Burwell & Brody, 2013) and to address not only safe sex practices but also to educate themselves from a relationship context to improve communication and negotiation

skills which could increase individuals' abilities to negotiate terms such as condom use (Manlove, et al. 2011).

One study by Raiford et al. (2013) sought to understand the relationship of power dynamics for women in relationships and how that correlated STI risk. They recruited young African American women aged 15 to 21 years who were already participating in a sexual risk reduction study in Atlanta, Georgia. In total, there were 847 eligible participants and 715 completed the assessments. The average age of participants among the 715 was 17.8 years. Nearly half of the participants were in homes on public assistance. In this study, they found that women who perceived themselves as having a low level of power in their relationship were more 3.9 (95% CI=1.0 – 14.9) times more likely to have an STI. The odds were also 3.4 (95% CI=1.0-11.6) times higher of an STI for those women who reported abuse in their relationship in the preceding 60 days. The associated risk of STI diagnosis supports the notion cited by Kogan et al. (2013) and further supports the necessity for education and parental involvement in safe sex education. East et al. (2010) assessed the condom negotiation skills of young women considering the importance of their use. Their qualitative study included female participants with a history of STIs and queried them about their willingness and ability to negotiate the use of male condoms with their partners. None of the participants stated negotiating condom use at all, citing varying reasons including unequal power dynamics, abuse, and lack of perceived susceptibility. Researchers have used the (MCAS) as a means of measuring attitudes toward condom use with success.

Adding further complexity to the variation in risk factors is that research has also shown differential risks associated with immigrants. Hoffman et al. (2011) noted that immigrants often have in one study in Texas Wilson, K.S., Eggleston, Diaz-Olavarrieta, and Garcia (2010)

examined sexual behaviors in immigrants. They defined risk behaviors as 3 or more partners in a year, sex with commercial sex workers, same sex intercourse histories, past STI diagnosis, and considering themselves at risk of STI contraction. They were found to be more likely to have engaged in sex with a commercial sex worker. In fact, those men whom reported living with a wife or partner were more likely to have done so than those living alone. Additionally, their study showed that men who engaged in substance use (18 percent) were more likely to engage in risk behaviors highlighted in the study (Wilson, K. S. et al., 2010). Some immigrants may increase their risk simply by moving from a place with lower incidence of STIs to a place of higher incidence particularly without changes in norms of sexual behavior if they were engaged in risk behavior beforehand (Hoffman et al., 2011). There has been a demonstration of promise on the part of sex education programs and their ability to impact behaviors. In Brazil, there has been a reduction in the number of individuals engaging in sexual intercourse without condoms which could speak to effectiveness of educational campaigns that are culturally tailored (Mesenburg, Muniz & Silveira, 2014). When considering the wide range of factors that influence sexual behavior the reasons for the challenge of addressing STI prevention through sexual behavior modification becomes that much clearer.

### **Social Determinants of Health and STIs**

Social determinants of health are the complex economic and social conditions that impact the health of individuals and communities. The concept is broad and involves many elements including income, culture, education, child development, employment, food security, access to healthcare and other services (Curie, 2012; Sharpe, Harrison & Dean, 2010). Joint United Nations Programme on HIV/AIDS (UNAIDS, 2008) highlighted the issue of social determinants of health and the impact that they have on epidemics of infectious disease in the

world today. Research has shown that while genetics can play a role in the acquisition of certain illnesses, infectious diseases often cluster in places characterized as socially and economically disadvantaged (Sharpe et al., 2010).

While a significant amount of research on STIs focuses on individual level factors associated with STI risk only a few studies have sought to understand larger scale social factors. Those that have made determinations that the risk factors for STIs are not only at the individual level but also at the social organizational level which is strongly tied to social determinants of health (Weyers, Dragano, Richter, & Bosma, 2010). Socioeconomics, social support systems and social control have been linked to an association with STI risk (Jennings, Hensel, Tanner, Reilly, & Ellen, 2014) along with differential access to health services (Regmi, Van Teijlingen, Simkhada, & Acharya, 2010).

To effectively address these epidemics as a means of tackling what the WHO (2009) has labeled the greatest public health threat of our time public health must understand how social determinants play a role in the spread of STIs (CDC, 2009; Sharpe et al., 2010). Without that understanding development of effective intervention programs is hampered. It is known that social determinants of health have a strong impact on disease and STIs are no exception overall (Dunkle, Wingood, Camp, and DiClemente, 2010). Income has been identified as a contributor to the prevalence of STIs given that transactional sex is more common in those with lower SES. Approximately 33 percent of African American women surveyed in a study by Dunkle et al. (2010) reported staying in relationships due to income concerns and engaging in transactional sex for similar reasons with persons that they knew were engaging in sexual relationships elsewhere putting them at increased risk for infection. These women were not only typically of lower SES, but also had lower educational levels. Research has shown that

low education levels are a trend among those at risk for STIs. For example, Khajehei, Ziyadlou, and Ghanizadeh, (2013) found that of their 281 female participants and 276 male participants those with lower education levels had less knowledge of sexual health topics than those with more education ( $p < 0.05$ ). Annang, Walsemann, Maitra and Kerr (2010) examined the relationship between education levels and STI risk and found that there was a relationship between level of education and STIs. They specifically focused on African American and White females and they did find that as educational levels increased the percent of women self-reporting STI histories decreased. Among African American women 16.6% of those with less than a high school education reported an STI (N=189), 14.4% of those with high school education only reported an STI (N=738) and 13.2% of those who had attended or graduated from college reported an STI. Among the White women in their study trends were similar with 9.6% of those with less than a high school education reporting STIs (N=442), 3.2% of those with a high school education reported STIs (N=1,764), and 1.8% of those who had attended or graduated from college reported an STI history (N=1,201). However, education levels are not necessarily universally protective against STIs.

Often, low SES communities also see challenges regarding access to care even in larger metropolitan areas. They typically have longer travel distances for seeking care which can be detrimental in being able to seek timely care for an STI and leads to reduced rates of education for prevention which is typically offered in treatment settings (Bonney et al., 2012). Another more elusive STI in the U.S. and abroad is *Mycoplasma genitalium* which has rates in range of *Chlamydia* and *Gonorrhea* and has also been associated with Pelvic Inflammatory Disease (PID) and infertility (McGowin & Anderson-Smits, 2011). The economic burden for STIs in the U.S. is substantial with recent estimates of approximately 15 billion dollars in economic

burden for all STIs (Owusu-Edusei et al., 2013; Satterwhite et al., 2013). As mentioned previously social determinants of health have an impact in many nations and recent studies have highlighted the impact of social determinants on STI burdens in many countries throughout the world (Wang, Viswanath, Lam, Wang, & Chan, 2013) and it is particularly clear in the U.S. when looking at racial/ethnic disparities as highlighted in figure 2.

While educational levels have been viewed as one of the primary means to address sexual risk behaviors it is worth noting that social determinants of health such as culture, race/ethnicity, access to care and other such factors are more important than educational levels are alone. This does not mean that increased education would not be effective, but it should be considered in tandem with other ways of addressing social determinants (Annang et al, 2010).

### **Sex Education and Young Adults**

Our current system of preventing STDs focuses on education programs for adolescents as research has supported attempts to educate adolescents before they first initiate intercourse (Liu et al., 2015). The focus here is on young adults between the ages of 20 to 29 years. Research has shown that the burden of STIs does lie mostly with adolescents (14-19 years), but the rates for young adults (20-29 years) is just as high (National Health and Nutrition Examination Survey 1999-2008 [NHANES] unpublished data as cited in CDC [2011]). Researchers have attributed these high rates of disease in this demographic to low perceived susceptibility which has been demonstrated in college students and (Lewis, Miguez-Burbano & Malow, 2009) young adults in general (de Visser & O'Neill, 2013; Newby, Wallace & French, 2012; Friedman, & Bloodgood, 2010). That is, this group does not perceive that they are susceptible to contracting an STI and demonstrate knowing little about STIs in general (Friedman & Bloodgood, 2010). Many studies have considered sexual health information and

found that the rate of sexually transmitted infections is rising not only through heterosexual contact, but also in mother to child transmission of diseases like HIV (Prati et al., 2014) but few studies to date have really examined sexual education in our demographic of interest. Most such studies have examined sexual education in adolescents and where studies have considered adults they often focus on the impact that parents' attitudes have on sex education for adolescents (Wilson, E.K., Dalberth, Koo, & Gard, 2010) or on sex education for very specific demographic groups such as the elderly (Minichiello, Hawkes & Pitts, 2011) or disabled (Wiegerink et al., 2011; Bonfils, Firmin, Salyers & Wright, 2015).

### **Health Information Dissemination**

Health information is much more widely accessible today than it was a decade ago due to the internet, social media, and globalization. Public health and the public in general because the internet not only provides valuable information, but can perpetuate misinformation that can complicate public health efforts. While studies have indicated that many individuals still rely on physicians for public health information the media does have a strong impact as well (Hesse et al, 2005). A study conducted in Australia by Hogue, Doran & Henry (2012) involving 800 participants found that 68.8% heard about health conditions via the media 38.4% heard about the condition via the media used the internet to learn more rather than discussing with their physician (Yan, 2010) and studies in the U.S. have also found in high rates of internet use for learning about health conditions, particularly STIs. For example, Rushing and Stephens (2011) studied health information seeking among American Indian and Alaskan Native youths and found that 75% of their 405 study participants reported seeking health information online. Fajiram (2010) made similar observations, but did find that the use of the internet for seeking health information did vary by topic. Though their sample of 149 college students was quite

small they did find that use of the internet for seeking general sexual health information among their sample of college students ranged from 20.4% to 76.5%. Use of the internet for STI information was between 24.9% and 70.6%.

In addition to searches on the internet there has been an increase in the use of social networking sites as a resource for health information and health information dissemination. The use of social networking sites for this purpose was more pronounced among those with a higher SES, a healthcare provider, and higher education levels were more likely to social networking sites in this way presumably because they felt a level of confidence in interpretation of such information (Thackeray et al., 2013). In support of these findings another study found that being male, of low SES, and generally of a lower education level was correlated with less likelihood of seeking health information (Wang et al., 2013). Minority populations are also a concern when it comes to health information dissemination because often minority populations are of low SES and suffer from a wider range of health problems overall and researchers have found that health information is often not sought by these individuals' due to lack of trust of that information as well as lack of appropriately designed educational programs (Richardson, Allen, Xiao, & Vallone, 2012).

While the internet is a very powerful tool that public health does try to use as a means of offering education on numerous issues including STI prevention the current offerings are not as effective as they could be (Whiteley, Mello, Hunt & Brown, 2012). It has been found too that most adults whom use the internet for health information do so for widely variable reasons. Some are proactive researchers whom focus their searches on ways to better their own health and some use internet resources to search for information on health conditions that they are suffering from (Weaver et al., 2010). Typically, whether an individual uses internet, social

media, or other such sources for health information is determined by their level of comfort with that medium (Dobrinsky & Hargittai, 2012). In addition, given the stigma associated with STIs and research that has shown the health information is most often sought on the internet for highly stigmatized conditions it can be hypothesized that the internet is oft used by our target demographic if an STI is suspected, which, by then indicates that prevention efforts fell short (Rowlands, Loxton, Dobson & Mishra, 2015; Gilliam, Chor & Hill, 2014). Web platforms used to educate individuals about STIs and safe sexual behavior use a method referred to as reverse discourse which is meant to aid in destigmatizing by acknowledging shame that is often associated with STIs and brushing that aside, but some such websites are met with backlash and less effectiveness because they can often oversimplify something that is very complex (Davis, Shoveller, Oliffe, & Gilbert, 2012).

Public service announcements have been utilized for the purposes of reaching target populations at risk for contracting STIs with varying levels of success (Van Stee et al., 2012). Kwan, Arbour-Nicitopoulos, Lowe, Taman and Faulkner (2010) conducted a general study in which they identified health topics that college students obtained information about, what sources they used, and the perceived believability of those sources. Of the just over 1200 participants only 21 percent reported receiving information on sexually transmitted diseases. The study found that most often information was gleaned by students from the internet even though most participants listed the internet as an untrustworthy health information source. It has also been important, as demonstrated in the literature, to understand the overall perception of risk for a population when disseminating health information.

Theoretically, information dissemination in and of itself need not be terribly complicated. It can be enough that the information being disseminated provoke thoughts about

risk scenarios because some research has shown that imagining the risks of a certain behavior have been enough to increase the notion of perceived risk (Mevissen, Ruiter, Meertens, Zimbile & Schaalma, 2011). A significant percentage of adults use the internet regularly when searching for health information and there have been many that state that they research medications, treatments, and search for information on others' experiences with the same conditions (Fox & Duggan, 2012). In their research Garcia-Retamero and Cokely (2011) found that when information was delivered about sexual health to young adults the effectiveness was partly dependent on perceived risk to the acquisition of an STI. They found that those with low perceived susceptibility were most likely to be affected by gain-framed messages. That is, if the message focused on the benefits to safer sex behaviors or STI screenings the participants were more likely to be impacted if their perceived susceptibility were low. For those with higher perceived susceptibility those messages that were loss-framed (or focused on what could be lost by not engaging in the behavior) the message was more effective. The intervention utilized text messaging as well which is referred to in the literature as "New Media." This consists of not only text messaging, but also social media and internet based communication mediums. New media will be used as a means of reaching out to the target population for this research as well and the ability to reach that population will be part of the analysis. The use of new media platforms has been effective in recent years in reaching out to both adolescents (Guse et al., 2012) and young adults particularly when the intervention was designed for a specific target group (Mevissen et al., 2011; Giorgio, Kantor, Levine, & Arons, 2013) for sexual health promotion. Electronic media is a popular method of disseminating information from the use of text message delivery (Heron & Smyth, 2010; Swendeman & Rotheram-Borus, 2010), social media platforms (Thackeray et al., 2013).

A potentially powerful tool in the arsenal for education about STIs in the hope of increasing perceived susceptibility is the use of repetitive messaging and incorporation of information about antibiotic resistance in STIs. This review has revealed a gap in the literature as the use of antibiotic resistance information in educational processes has not been found to have been used in any demographic as a tool to increase perceived susceptibility. In addition, some research has shown that young adults are using new media sources for information but there is still a weak understanding as to exactly what precipitates a search for health information with relationship to STI research. Lacking is also an understanding as to the patterns and behaviors in minority groups in terms of what comprises their STI risk and without a true understanding of that burden public health professionals cannot hope to address it (Dodge et al., 2010).

### **Summary and Transition**

The literature has demonstrated that there are numerous issues with which to contend when considering sexual risk behavior and health information seeking behaviors in young adults. The young adult demographic is of concern with their incidence of infection and steps should be taken to better address the burden. Consideration must be given to social determinants of health and how they impact behavior and risk knowing that addressing those risks will vary from one population to the next. The literature has certainly shown that there is differential risk based on social factors and that there are racial disparities. The literature also verifies concern with the development of antibiotic resistance to treatment in STIs and great public health concern if this is not addressed, but no literature demonstrates that the issue of antibiotic resistance in STIs is shared with at risk groups proactively. The information is available when directly sought out, but no programs have been found to address antibiotic resistance and no information has been found

to demonstrate that doctors share such information with patients. Given the severity of the issue, this is information that should be shared via a more proactive approach with those most at risk of the negative health effects of a difficult to treat, or perhaps entirely untreatable STI. This may also impact those at risk by enlightening them to treat the potential for an STI as a serious health problem. This research cannot address the entirety of the why here, but perhaps, gain some insight into it.

Therefore, the gap in the literature that this research has attempted to address is gaining a better understanding of what factors influence perceived susceptibility to STIs, what precipitates health information seeking about STIs, and how might information about antibiotic resistance trends in STIs impact their behavior. This will contribute to the Walden University goal of social change by aiding in the discovery of a new paradigm of STI prevention.

## **Chapter 3: Study Design and Methods**

### **Introduction**

This study intended to examine the association of perceived susceptibility to STDs, health information seeking behaviors and sexual risk behaviors in U.S. young adults. By better understanding the sexual risk behaviors and perceived susceptibility of this population along with their sexual health information seeking behavior public health professionals may better be able to see patterns emerge that can aid in the development of intervention programs to reduce rates of infection.

In this chapter, the research design and rationale that was used will be covered. Details about the instruments that were used will be shared along with their reliability and validity. All methods that we used will be shared including limitations and ways in which to address those as well as potential ethical complications and any threats to validity.

### **Research Design and Rationale**

This study examined age, sex and race/ethnicity as independent variables. The dependent variables were sexual risk behaviors/condom use behaviors, health information seeking behaviors, and perceived susceptibility to STI's.

The research design was a quantitative survey. There were three different surveys offered online through SurveyMonkey. The surveys were anonymous. Use of a quantitative survey was a necessary and appropriate research strategy because understanding individual perceptions and behaviors required querying the population directly.

## **Methodology**

### **Population**

The target population for this study was US young adults aged 20-29 years. For this study standard, descriptive statistics were used to describe the general characteristics of the sample population and multiple regression was used to measure the relationship between variables. Sample size was calculated using the G\*Power tool with an effect size of 0.10 which is considered a small effect (Cohen, 2013). A power of 0.80 was also selected. Four tested predictors and seven total predictors were selected. The tested predictors were perceived susceptibility, condom use self-efficacy, sexual risk behaviors, and health information seeking behaviors. Additional predictors include age, sex and race/ethnicity. This criterion generated a minimum sample size of 204 participants. Since a minimum of 204 participants was required for analysis, but some needed to be excluded, the cut off number of participants selected was 300. If recruitment attempts had not resulted in meeting the minimum sample size requirement the results write up would have included a description of the resultant limitations.

### **Sampling and Sampling Procedures**

This study utilized self-selection sampling of U.S. young adults using social media platforms for recruitment. Rather than using one social media platform three were used including Facebook, LinkedIn, and Twitter. Using multiple platforms was helpful in recruiting. Responses were collected until at least 300 respondents completed the survey.

### **Procedures for Recruitment, Participation, and Data Collection**

Only basic demographic information including age, race/ethnicity, and sex was collected to compare the sample population to the general US young adult population to determine generalizability. That information was collected on the adapted HINTS survey tool (see

Appendix D). Other information collected was on condom use self-efficacy utilizing CUSES (see Appendix B), and sexual risk behaviors in the sexual risk assessment survey (see Appendix F). Informed consent was obtained when participants visited the survey link. The first page before beginning the survey explained the purpose of the study and how information collected was to be used. The participants were required to select a confirmation of having read and understood the informed consent document before they were able to move to the survey. If they had questions about the study they were asked to first reference a “Frequently Asked Questions” document that provided them with additional information (see Appendix I) as a means of addressing anticipated questions without jeopardizing anonymity or, if their concerns were not addressed in the informed consent document. The informed consent documentation was provided ahead of the survey and made available to download with contact information for the Walden IRB (see Appendix H). Once informed consent was confirmed by the selection of the “Yes” to a query about having read and understood the informed consent then study enrollment was documented and the person was taken to the survey.

### **Instrumentation and Operationalization of Constructs**

This study utilized three survey instruments. The first was the Condom Use Self Efficacy Scale (CUSES) developed by Brafford and Beck (1991) which was used with permission (See Appendix A). The second was a sexual health risk assessment survey developed by the Marin County California Department of Health and Human Services (2010) which was adapted for use here with permission (See Appendix E). The final instrument is the Health Information National Trends Survey (HINTS) developed by the National Cancer Institute (NCI, 2008). This was also adapted with permission (See Appendix C). The assessments reliability and validity have not been tested (see Appendix J) and this study did not seek to validate instruments.

CUSES has been utilized in numerous studies some of which have been highlighted in Chapter 2. Several studies have utilized CUSES to measure condom use behaviors among college students (Asante & Doku, 2010; Brafford et al., 1991), adolescents (Baele, & Maes, 2001) and other populations (Forsyth et al., 1997) and internationally as well (Asante et al., 2010; Coffman, Smith, Flisher & Caldwell, 2011). While CUSES has been validated in certain population as noted above its validity has not been assessed with young adults in the US aged 20 to 29 years. HINTS also have not been validated with our population of interest.

The HINTS is a cross-sectional survey tool that has been used by NCI to study health information seeking behaviors as they pertain to cancer. The intent with the survey is to better understand the way in which individuals obtain health information and how that relates to demographics, education, and socioeconomic status. The HINTS survey has been used over several cycles and has included nationally representative samples utilizing both mail in surveys and telephone based surveys (NCI, 2014).

The sexual health risk assessment survey was adapted from the survey instrument utilized by Marin County. Marin County has used the survey to assess risk behaviors of patients since 2010. It is like sexual health risk assessment surveys used at STD clinics within other health departments. The validity and reliability of this specific instrument has not been assessed for any population including young adults 20 to 29 years of age (see Appendix J).

### **Threats to Validity**

The greatest threat to validity with survey studies is the issue of self-report (Brener, Billy, & Grady, 2003). Given the sensitive nature of sexual health the surveys anonymity was used as a means of encouraging honesty. The importance of honesty and the assurance of anonymity was stressed during the informed consent process to address that threat to validity. Another potential

threat to validity is that the sexual health risk assessment survey used has not been evaluated leading to potential threats to internal validity for that instrument.

Research examining CUSES has found that the scale is valid and maintains internal consistency (Forsyth et al., 1997). It does not, however, assess negotiation skills and interpersonal communication skills required for effective condom use negotiation. Nor does it assess skills in effectively using condoms (Forsyth et al., 1997). These concerns are the reason this research did not use CUSES alone.

Other potential threats to validity in this study pertain to the study design. Use of an anonymous survey platform leads to a certain reduction in control over the conditions under which the survey is completed. For example, there is no way to control for one person submitting more than one survey or for multiple people collaborating to complete a single survey. These are certainly limitations worth noting. The use of social media platforms for recruitment can also pose some challenges, but research has supported the viability of using social media as a recruitment method for health studies (Fenner, et al, 2012).

### **Ethical Procedures**

The individuals who chose to participate in this study were required to complete an informed consent process, including indicating their agreement to voluntarily participate prior to their being able to access the survey. Publication of the findings will enable participants to learn the results. In addition, a summary of the findings will be posted to the social media sites where recruitment took place. All participation was completely anonymous. IRB approval was obtained from Walden University.

A frequently asked questions (FAQ) document was made available to participants with the informed consent document to answer any anticipated questions (See Appendix I). If participants

still required contact to ask additional questions they had the option to contact the Walden IRB to have those questions answered so that the researcher would not be able to identify that participant. Nevertheless, not participants made contact during data collection. Another potential ethical issue is the informed consent document itself. It must be written at an appropriate level so that it is easily understood and as clear and transparent as possible. Every effort was made to do that. The proposed research did not occur until IRB approval was obtained.

All surveys were collected electronically through SurveyMonkey. Analysis of the survey data was done using SPSS on the researcher's personal home computer. SurveyMonkey utilizes SSL/TLS data encryption for security as well as username and password access and enhanced HIPAA compliance security features and regular backups to protect data integrity (SurveyMonkey, 2015).

### **Summary**

In summary, this was a quantitative survey study that sampled from U.S. young adults utilizing social media to attain participants. Sampling for this study was done by self-selection using social media platforms LinkedIn, Twitter, and Facebook for recruitment. All participation was voluntary and anonymous. Three survey instruments were used: CUSES (in its original form); the Sexual Health Risk Assessment tool (adapted); and, HINTS (adapted) – permission was obtained to allow adaptation for this study. The surveys were made available electronically. Ethical oversight was provided by the Walden University IRB. There are some limitations with this study that have been discussed here.

*Table 1: Dependent Variables*

<b>Variable</b>	<b>Nature of the Variable</b>	<b>Applicable Research Question</b>
Perception score	Ordinal	How closely does perceived STI susceptibility (as measured in HINTS) correlate with evidence of STI risk (as measured by CUSES)?
Health information seeking behaviors	Categorical	Quantitative: How do young adults (20-29 years) obtain health information?

*Table 2: Independent Variables*

<b>Variable</b>	<b>Nature of the Variable</b>
Age	Ordinal
Sex	Categorical
Race/Ethnicity	Categorical

To address the assumptions associated with multiple regression analysis certain steps were taken based on the nature of the assumption. First, assumptions were tested via the use of boxplots and a goodness of fit test to assess normality. Any extreme outliers were to have been removed prior to the analysis, but no extreme outliers were found. To address multicollinearity factor analysis was conducted before multiple regression analysis to assess independence (Statistics Solutions, 2015). More detail on the assumptions and analysis can be found in Chapter 4.

## **Chapter 4: Results**

### **Purpose**

The purpose of this quantitative survey study is to determine whether there is an association between perceived susceptibility to STIs, sexual risk behavior and the acquisition of health information as it pertains to sexual health topics in young adults. In this chapter, the results of the survey study will be shared which includes the demographic breakdown of the participants, response rates to the survey, and answers to the research questions. The research questions are as follows:

RQ1 – Quantitative: How closely does perceived STI susceptibility (as measured in HINTS) correlate with evidence of STI risk (as measured by CUSES)?

RQ2 -- Quantitative: How do young adults (20-29 years) obtain health information?

RQ3 -- Does perceived susceptibility/risk of a condition have a relationship with health information seeking behaviors?

### **Description of Participants**

Data collection for this study was conducted through SurveyMonkey upon receiving Walden University IRB approval. Data collection was done for a period of approximately 6 months. There were 303 total responses with 140 complete enough for analysis for a response rate of 42.2 percent. Of the 140 surveys 12 were dropped resulting in a final participant count of 128 either because the respondent selected “none of the above” as their age demonstrating that they did not fit into the population in question or because they indicated “yes” to being a resident of a prison, nursing home, treatment facility or group home or indicated a current pregnancy or disability status. Recruitment was done using three social media platforms (Twitter, LinkedIn and Facebook) through the Facebook and Twitter platforms recruitment announcements were

created targeting Americans aged 20 to 29 years. Postings were made to LinkedIn to gain participants, but no one using that platform chose to participate. Only Facebook and Twitter users chose to participate. There were no discrepancies in data collection between what was proposed in Chapter 3 and what took place.

*Table 3: Demographic Descriptives*

Variable		Frequency (n)	Percent (%)	
Race	White	113	88.3%	
	Asian	6	4.7%	
	Black/African American	6	4.7%	
	Native Hawaiian/Other Pacific Islander	2	1.6%	
	Not Given	1	0.8%	
	Ethnicity	Hispanic	112	87.5%
		Not Hispanic	16	12.5%
Sex	Female	93	72.6%	
	Male	35	27.4%	
Age	20 Years	14	10.9%	
	21 Years	9	7.0%	
	22 Years	7	5.5%	
	23 Years	12	9.4%	
	24 Years	17	13.3%	
	25 Years	16	12.5%	
	26 Years	12	9.4%	
	27 Years	16	12.5%	
	28 Years	12	9.4%	
	29 Years	13	10.2%	
State of Residence (N=128)	Alabama	2	1.56%	
	Arkansas	1	0.78%	

*Note:* Overall mean age = 24.72; SD = 2.811. The mean age for males = 25.37 years (SD = 2.80) and for females = 24.47 years (SD = 2.79) (See pp.4 for comparison of total populations and sample populations). The male and female age groups are not statistically similar within the sample population with a difference of -0.900 (95% CI, -1.9960 to 0.1960),  $t(126) = -1.625$ ,  $p = 0.1066$ .

California	22	17.19%
Connecticut	2	1.56%
Colorado	3	2.34%
Delaware	1	0.78%
Florida	4	3.13%
Georgia	3	2.34%
Iowa	1	0.78%
Idaho	1	0.78%
Illinois	4	3.13%
Indiana	2	1.56%
Kansas	2	1.56%
Kentucky	1	0.78%
Massachusetts	4	3.13%
Maryland	3	2.34%
Michigan	1	0.78%
Minnesota	1	0.78%
Missouri	4	3.13%
North Carolina	3	2.34%
New Hampshire	1	0.78%
New Mexico	2	1.56%
Nevada	1	0.78%
New York	9	7.03%
Ohio	6	4.69%
Oregon	2	1.56%
Pennsylvania	4	3.13%
South Carolina	1	0.78%
Tennessee	5	3.91%
Texas	23	17.97%
Virginia	1	0.78%
Washington	5	3.91%
Wisconsin	1	0.78%
West Virginia	1	0.78%
Not Given	1	0.78%

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Note: See pp.4 for comparison of total populations and sample populations.

According to Howden & Meyer (2010) there are approximately 21,585,999 people between 20 and 24 years of age and 21,101,849 between 25 and 29 years of age. Of the total U.S. population for this age group, 50.6 percent were between 20 and 24 years and 49.4 percent were between 25 and 29 years. In the sample population for this study there were 59 people between 20 and 24 years of age which accounts for 46.1 percent of the sample population ( $Z=1.0123$ ;

$p=0.3125$ ). There were 69 people between 25 and 29 years which accounts for 53.9 percent of the total sample population ( $Z=1.0123$ ;  $p=0.3125$ ). Thus, the proportionate categorical distribution (20-24, 25-29 years of age) of the study participants was statistically like the total US population with the same age groups. Howden and Meyer (2010) state that the male to female ratio was 1.028 in the 2010 census. In the US 2010 census for this demographic 50.7 percent were male and 49.3 percent were female. Whereas in the study there were significantly more females (72.6 percent) than males (27.4 percent) with a male to female ratio of 0.377 which is dissimilar from the US population for both sexes

As seen in Table 3, there were more respondents in Texas and California than in other states and all fifty U.S. states were not represented in the sample. In addition, the sample was primarily comprised of White (88.3 percent) individuals which is not representative of the U.S. population. The ethnicity distribution was primarily Hispanic (87.5 percent) which is also not representative of the US population. See Table 4 below for comparisons between the sample population and the total target population.

*Table 4: Race Sample and Target Population Comparisons*

	Sample Population %	Total Target Pop. %	Z-Score; p-value	Interpretation
<u>Race</u>				
White	88.3%	78.0%	$Z = 2.8128$ ; $p = 0.00496$	Dissimilar
African American	4.7%	15.6%	$Z = -3.4079$ ; $p = 0.00064$	Dissimilar
Native Hawaiian/Other Pacific Islander	1.6%	0.3%	$Z = 2.9289$ ; $p = 0.00338$	Dissimilar
Asian	4.7%	6.1%	$Z = -0.6851$ ; $p = < 0.05$	Similar
<u>Ethnicity</u>				
Not Hispanic	12.5%	73.9%	$Z = -15.8238$ ; $p = 0$	Dissimilar
Hispanic	87.5%	26.1%	$Z = 15.8238$ ; $p = 0$	Dissimilar
<u>Gender/Age</u>				
Males 20-29 Yrs	35 (27.4%)	21,649,767	$Z=-5.2892$ ; $p=0$	Dissimilar

		(50.7%)		
Females 20-29 Yrs	93 (72.6%)	21,038,081	Z=5.2892; p=0	Dissimilar
		(49.3%)		

U.S. Census Bureau (2010)

## Results

One of the research questions asked in this study is; how do young adults obtain health information? Two variables were used to determine general health information seeking sources (HealthInfo) and STD specific health information seeking sources (STDInfo). Using frequency analysis of the 128 eligible responses the internet was the top selected response with 87.5 percent of all participants stating that this source was their primary source for general health information; and a doctor or healthcare provider was only selected as the primary source by 4.7 percent of respondents. For STD specific health information, the results were similar with the internet being the primary cited source with 75.8 percent of respondents; and a doctor or healthcare provider was only selected by 3.1 percent of respondents. There were 20 respondents who chose not to answer this question. Based on this information we can reject the null hypothesis that young adults use other (not internet) sources for health information. The internet is shown to be a primary source. See the summary of the frequency analysis for this research question in the tables below.

**Table 5: Summary of Frequency Analysis for HealthInfo and STDInfo Variables**

Survey Selection	Frequency	Percent
<u>HealthInfo</u>		
Books	3	2.3
Brochures, pamphlets, etc.	0	0
Family	3	2.3
Friend, or Co-Worker	1	0.8
Doctor or healthcare provider	6	4.7
Internet	112	87.5
Library	1	0.8
Magazines	0	0

Telephone information number	0	0
Complementary, alternative, or unconventional practitioner	1	0.8
Other: School Health Center	1	0.8
Missing	0	0
Total	128	100%
<u>STDInfo</u>		
Books	4	3.1
Brochures, pamphlets, etc.	1	0.8
Family	0	0
Friend, or Co-Worker	0	0
Doctor or healthcare provider	4	3.1
Internet	97	75.8
Library	0	0
Magazines	0	0
Telephone information number	0	0
Complementary, alternative, or unconventional practitioner	1	0.8
Other: School Health Center	1	0.8
Missing	20	15.6
Total	128	100%

The last research questions for this study pertained to the relationship between perceived susceptibility and health information seeking behaviors and perceived susceptibility and risk behaviors as measured by the Condom Use Self Efficacy Scale (CUSES). To answer these questions (RQ1 – Quantitative: How closely does perceived STI susceptibility (as measured in HINTS) correlate with evidence of STI risk (as measured by CUSES)? RQ2 -- Quantitative: How do young adults (20-29 years) obtain health information? RQ3 -- Does perceived susceptibility/risk of a condition have a relationship with health information seeking behaviors?) a multiple regression was run to predict perceived susceptibility from the CUSES and health information seeking scores. There was linearity assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals determined by the Durbin- Watson statistic of 1.761. Homoscedasticity was assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was

no evidence of multicollinearity, as assessed by a tolerance value greater than 0.1 (Tolerance = 0.999). There were no studentized deleted residuals greater than  $\pm 3$  standard deviations, no leverage values greater than 0.2, and the values for Cook's distance greater than 1 indicating no significant outliers. The normality assumption was met, as assessed by the P-P Plot (See Appendix K). The multiple regression model for these research questions (RQ 1: How closely does perceived STI susceptibility [as measured in HINTS] correlate with evidence of STI risk [as measured by CUSES]; RQ 3: Does perceived susceptibility/risk of a condition have a relationship with health information seeking behaviors?) did not statistically significantly predict perceived susceptibility so we can accept the null hypotheses (RQ 1:  $H^0$ : There is no correlation between perceived susceptibility and STI risk; RQ 3:  $H^0$ : There is no relationship between perceived susceptibility and health information seeking)  $F(2,124) = 0.560, p > .001$  (sig. 0.573), adj.  $R^2 = -0.007$ . All three variables did not add statistically significantly to the prediction,  $p > .05$ . Regression coefficients and standard errors can be found in Table 11 (below).

**Table 6: Summary of Multiple Regression Analysis**

Variable	<i>B</i>	SE <sub>B</sub>	Beta
Constant	10.617	0.959	
CUSES	0.006	0.009	0.059
HIS	0.044	0.054	0.072

### Additional Findings

In the process of gathering data for this study some additional data arose. Data was collected using CUSES to assess risk behaviors for one research question, but it was also thought important to assess risk using a risk assessment tool as well to determine if the results of CUSES would fall in line with the results of the risk assessment. Linearity was assessed in SPSS between the risk score and the CUSES score. No linear relationship was detected based on a visual inspection of a scatterplot (See Appendix K). One segment of the adapted Health Information

National Trends Survey (HINTS) survey questions participants about their trust in the healthcare system and healthcare providers. Given the nature of the inquiry about health information seeking it seemed important to assess whether there appeared to be problems with perception of the healthcare system. Healthcare trust scores were scaled from 0 to 38 with higher scores indicative of a more positive perception of healthcare. The mean score for this analysis was 25.68 (SD = 7.008) out of 38. A mean score of 25.68 out of 38 possible on a standard percent scale would be a 67.6 percent which would be less than a “C” on a grade scale. Data was also collected to determine the level of knowledge about STDs as it pertains to transmission and methods of prevention. This score range was 0 to 10 with higher scores indicating higher levels of STD knowledge. The mean score for the STD knowledge section of the survey was 8.95 (SD = 2.048). Using a standard percent scale, a score of 8.95 with a total possible of 10 would be an 89.5 percent score which amounts to a “B” on a grade scale. Finally, data was collected to ascertain how much access to internet sources respondents had given one of the study hypotheses. Access scores ranged from 2 to 8 with the average score of 3.31 (SD = 1.379). Transforming the scale beginning at zero the highest possible score was a 6 meaning that the mean score of 3.31 would be a percentage score of 55.2 which amounts to an “F” on a grade scale. Descriptive statistics were used to analyze the information gathered from scores on those survey sections. The results are shown in Table X below.

*Table 7: Summary of Descriptive Statistics for Trust, Access, and Knowledge Scores*

	Minimum	Maximum	Mean	Std. Deviation
Trust	0	37	25.68	7.008
STD Knowledge	5	10	8.95	2.048
Access	2	7	3.31	1.379

## Summary

In summary, for research question number one: how closely does perceived STI susceptibility (as measured in HINTS) correlate with evidence of STI risk (as measured by CUSES)? The answer is that there is no statistically significant relationship between perceived STI susceptibility (as measured in HINTS) with evidence of STI risk (as measured by CUSES) ( $p > .05$ ), thus the null hypothesis that there is no correlation between perceived susceptibility and STI risk is accepted.

For research question number two: how do young adults (20-29 years) obtain health information? A frequency analysis has shown that young adults surveyed in this study selected the internet as their primary means of gathering both general health information and STD specific health information, so for this research question we can reject the null hypothesis that young adults use other sources for health information and accept the alternative hypothesis that young adults use electronic platforms (internet, social media) and word of mouth for most information.

For research question number three: does perceived susceptibility/risk of a condition have a relationship with health information seeking behaviors; there is no statistically significant relationship between perceived susceptibility and health information seeking behaviors ( $p > .05$ ), so the null hypothesis that there is no relationship between perceived susceptibility and health information seeking is accepted.

In next chapter, I will summarize the complete study with a brief overview of the findings including conclusions, generalizability analysis, and the findings in context with the theoretical models used. This will include recommendations for future research and how this study has

contributed to the body of knowledge we have so far and how this research can contribute to social change.

## **Chapter 5: Discussion, Conclusions, and Recommendations**

### **Purpose Summary**

The purpose of this study was to attempt to better understand how young adults (20-29 years) in the United States seek health information. In addition, analysis of their perception of risk to STDs was examined to determine if perceived susceptibility has any relationship with how health information is sought and their risk behaviors.

### **Summary of Findings**

This study was concerned with three research questions. The first was whether there is a correlation between health information seeking and perceived risk of contracting an STD. Based on the analysis of the data there is no statistically significant correlation between perceived risk and health information seeking. This was not the expected result and this may be due to the small sample size that is not representative of the whole target population. A study with a representative population may be necessary to reassess this.

Another research question that was asked for this study was whether there is a correlation between STD risk and perceived susceptibility. Again, based on the analysis of this data there is no statistically significant correlation. This was also an unexpected result which could relate to the limitations of the study population and a representative population should be utilized to reassess this.

The final research question was concerned with how the population of interest seeks health information. It was hypothesized that the internet and word of mouth would be a primary source. The internet was reported to be the primary source of information for both general health information and STD specific health information. It was expected that the internet would be the primary source of information for the target population and it is a logical outcome.

### **Contributions to the Discipline**

With the use of these methods it cannot be shown that there is any correlation between health information seeking and perceived susceptibility or STD risk and perceived susceptibility. A review of the literature does not show much consideration for health information seeking behaviors among young adults so this neither confirms or disconfirms anything in the literature. The findings as it pertains to perceived susceptibility and STD risk are not confirmed by this study. There is added information to the discipline by being able to state based on the self-reported data in this study that the internet is a primary source for health information. This can aid in research aimed at developing health education tools for young adults to reduce STD rates in this vulnerable population.

### **Findings Within the Context of Theoretical Models**

The findings indicate that perceived susceptibility is not directly correlated to the way that young adults seek health information. This may indicate that the issue is more complex than the hypotheses in this study considered. This is not consistent with the HBM as the model would suggest that information seeking behaviors should change based on perceived susceptibility. It is possible that this finding is due to the limitations associated with the sample population or perhaps other variables beyond perceived susceptibility are at play that need to be considered.

### **Limitations to Generalizability**

There are several limitations to note for this study. While the minimum sample size was exceeded, the sample was still too small to address the research questions. In addition, since all subjects were recruited through social media and therefore are likely frequent users of social media there is some selection bias in the population and the sample underrepresents the African

American and Hispanic communities which could be explained due to differences in social media utilization between different racial and ethnic communities (Dariotis, Sifakis, Pleck, Astone, & Sonenstein, 2011; Diallo et al., 2010; Pflieger, Cook, Niccolai & Connell, 2013; Kogan et al., 2010). A potential for confounding exists due to social and cultural differences based on geographic location. Another potential limitation to this study is that the descriptive variables collected were limited and some variables that were not considered may have a confounding effect such as religiousness. Use of purposive stratification sampling by state based on education policy may have been a way to enhance selection procedures and may have reduced the potential for confounding based on the variables.

As there were no instruments found that specifically collect information for answering research questions of interest for this study three tools were used. Consideration was given to the potential for creating an instrument specifically for this study, but creating an instrument is a study on its own and it was decided that adapting instruments initially would be most appropriate with the intention of designing a survey instrument later for future research. The CUSES was used as well as adapted versions of the Health Information National Trends Survey (HINTS) and a Sexual Health Risk Assessment from Marin County Public Health. Adapting tools opens the study to criticism because the adapted tools, as used here, had not themselves been tested for reliability. No attempt was made in this study to validate instruments. In addition, the study population that arose in data collection though closely similar in age distribution was not representative of the total target population.

### **Recommendations for Further Research**

It is recommended that a research instrument be developed that is designed specifically for answering these research questions with this target population. In addition, data should be

collected that is more representative of the target population and from a larger number of individuals. Other recommendations for future studies on this topic are that data be collected using multiple avenues including mail surveys, telephone, and internet to include a wider range of individuals in the target population. Furthermore, this study underrepresents the African American and Hispanic communities and future research may benefit from specific targeting of those communities and consideration of additional demographic variables that may contribute to outcomes such as religion and socioeconomics. Variables such as religion and socioeconomics were not considered in this survey due to a desire to both a desire to keep the survey from being so long as to deter participation and to avoid too many changes to the adapted instruments.

### **Positive Social Change**

While the data and instruments have their limitations, it was found that health information seeking among the young adults who participated in this study is primarily done online. This can aid in positive social change through the dissemination of tools for education that may reduce the rate of STDs or other health ailments. It is possible that perceived susceptibility alone is not enough to prompt reading of educational tools, but combining that with use of normative beliefs and subjective norms as outlined in the TPB may be a useful strategy. Using internet platforms as a public health education tool is demonstrated in this study to be a tool for doing that.

### **Recommendations for Practice**

Weaknesses with this study include the small population size and methodology that led to a recommendation to further consider these research questions with instruments specifically designed for this inquiry. The data collected does indicate that the internet, as hypothesized, is an important tool for educating the young adult population. This is not specifically for STD

education, but general health education. There is the potential for bias here, however, given that the entire sample was collected using the internet. Nevertheless, a good recommendation for practice is the development of educational tools to be disseminated to young adults using internet platforms. As mentioned previously, this study suggests that perceived susceptibility alone might not be enough for behavior change, but combining with the use of normative beliefs and subjective norms as outlined in the TPB may be useful in prompting engagement.

The internet has been both a blessing and curse for public health and health education. On the one hand, it allows rapid communication on a wider global scale than ever before, but, it also allows for the spread of information that is not validated as accurate and misinformation can be dangerous for public health. We have seen this clearly with the anti-vaccination movement. A possible way to combat misinformation is to harness the internet as a source for educating our population and debunking bad information. Based on the responses of the participants in this study it is suggested that health information seeking is done mostly online for both general and STD specific health information seeking and could further contribute to positive social change through a more informed and healthier young adult population.

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## Appendix A: Permission Letter for CUSES

 **Kenneth Beck** <kbeck1@umd.edu>

📧 Sep 21



to me ▾

Dear Ms. Robison-Chadwell,

You have my permission to use the Condom Usage Self-Efficacy Scale. I have attached a copy of it. The scoring instructions are at the bottom.

Good luck with your research.

Sincerely,

Ken Beck

...



## Appendix B: The Condom Use Self Efficacy Scale (CUSES)

### The Condom Use Self-Efficacy Scale

These questions ask about your own feelings about using condoms in specific situations. Please respond even if you are not sexually active or have never used (or had a partner who used) condoms. In such cases indicate how you think you would feel in such a situation.

1. I feel confident in my ability to put a condom on myself or my partner  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
2. I feel confident I could purchase condoms without feeling embarrassed.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
3. I feel confident I could remember to carry a condom with me should I need one.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
4. I feel confident in my ability to discuss condom usage with any partner I might have.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
5. I feel confident in my ability to suggest using condoms with a new partner.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
6. I feel confident I could suggest using a condom without my partner feeling "diseased."  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
7. I feel confident in my own or my partner's ability to maintain an erection while using a condom.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
8. \* I would feel embarrassed to put a condom on myself or my partner.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
9. \* If I were to suggest using a condom to a partner, I would feel afraid that he or she would reject me.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------
10. \* If I were unsure of my partner's feelings about using condoms, I would not suggest using one.  

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
-------------------	----------	-----------	-------	----------------

- Disagree Agree
11. I feel confident in my ability to use a condom correctly.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
12. I would feel comfortable discussing condom use with a potential sexual partner before we ever had any sexual contact (e.g., hugging, kissing, caressing, etc.)
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
13. I feel confident in my ability to persuade a partner to accept using a condom when we have intercourse.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
14. I feel confident I could gracefully remove and dispose of a condom after sexual intercourse.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
15. \* If my partner and I were to try to use a condom and did not succeed, I would feel embarrassed to try to use one again (e.g., not being able to unroll condom, putting it on backwards or awkwardness).
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
16. \* I would not feel confident suggesting using condoms with a new partner because would be afraid he or she would think I've had a past homosexual experience.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
17. \* I would not feel confident suggesting using condoms with a new partner because I would be afraid he or she would think I have a sexually transmitted disease.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
18. I would feel comfortable discussing condom use with a potential sexual partner before we ever engaged in intercourse.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
19. I feel confident in my ability to incorporate putting a condom on myself or my partner into foreplay.
- Strongly Disagree    Undecided    Agree    Strongly  
Disagree Agree
20. I feel confident that I could use a condom with a partner without "breaking the mood."

- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
21. I feel confident in my ability to put a condom on myself or my partner quickly.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
22. I feel confident I could use a condom during intercourse without reducing any sexual sensations.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
23. I feel confident that I would remember to use a condom even after I have been drinking.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
24. I feel confident that I would remember to use a condom even if I were high.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
25. If my partner didn't want to use a condom during intercourse I could easily convince him or her that it was necessary to do so.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
26. I feel confident that I could use a condom successfully.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|
27. I feel confident I could stop to put a condom on myself or my partner even in the heat of passion.
- |  |                      |          |           |       |                   |
|--|----------------------|----------|-----------|-------|-------------------|
|  | Strongly<br>Disagree | Disagree | Undecided | Agree | Strongly<br>Agree |
|--|----------------------|----------|-----------|-------|-------------------|

\* item reverse scored

Each item has a 5-point response format ranging from "strongly disagree" (scored as 0) to "strongly agree" (scored as 4). The scoring is reversed on items 8, 9, 10, 15, 16, & 17. The scores for each item are then summed yielding a total score ranging from 0-108, with higher scores indicating greater condom use self-efficacy.

**Appendix C: National Cancer Institute (NCI) HINTS Letter of Permission****DEPARTMENT OF HEALTH & HUMAN SERVICES**

Public Health Service

National Institutes of Health  
National Cancer Institute  
Bethesda, Maryland 20892Division of Cancer Control  
and Population Sciences  
6130 Executive Boulevard  
EPN 8138  
Rockville, MD 20852  
Telephone: (301) 594-8778  
Fax: (301) 594-8787

October 9, 2015

Dear Ms. Robison-Chadwell:

The HINTS survey and related items are considered part of the public domain. I give you permission to use and adapt the items for your dissertation research.

We appreciate the support of researchers like you who utilize the HINTS data and encourage others to do the same.

Let me know if you have any questions.

Regards,

A handwritten signature in cursive script, appearing to read "Richard P. Moser".

Richard P. Moser, Ph.D.  
Data Coordinator, Health Information National Trends Survey (HINTS)  
Acting Chief, Science of Research and Technology Branch (SRTB)  
Behavioral Research Program  
Division of Cancer Control and Population Sciences  
National Cancer Institute

(w): 240-276-6915  
(fax): 240-276-7907  
moserr@mail.nih.gov

**Appendix D: Adapted HINTS Survey**

**This survey will be scored in sections.**

**Demographics:** Each item has a multiple choice response. Descriptive statistics will be utilized to describe the population using data from this section. Those with a handicap and pregnancy status will be excluded as will individuals who select “none of the above” for question 1.

1. What is your age

- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- None of the above

2. Are you male or female? (select one)

- Male
- Female

3. Are you Hispanic or Latino? (select one)

- Yes
- No

4. Which one or more of the following would you say is your race? (select one)

- American Indian/Alaskan Native
- Asian
- Black/African American
- Native Hawaiian/other Pacific Islander
- White

5. Are you currently a resident at a prison, treatment facility, nursing home, assisted living, group home? (select one)

Yes

No

\*Note: Individuals who are resident at a prison, treatment facility, nursing home, assisted living, group home will be excluded

6. What is your disability status? (mark all that apply)

Disabled

Not disabled

\*Note: Individuals with a disability status will be excluded

7. Are you currently pregnant? (select one)

Yes

No

\*Note: Pregnant women will be excluded

**Section A:** Questions 1-4 are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). Higher scores in this section indicate greater levels of information seeking. The minimum score is 0 and the maximum score is 18. Question 2 will be used to categorically identify the primary mode of information seeking for general health information.

1. Have you ever looked for information about health or medical topics from any source? (select one)

Yes (1)

No (0) → Go to next section

2. The most recent time you looked for information about health of medical topics, where did you go first? (check one)

Books (1)

Brochures, pamphlets, etc. (1)

Family (1)

Friend or Co-Worker (1)

Doctor or Healthcare Provider (1)

Internet (1)

Library (1)

Magazines (1)

Telephone information number (1)

- Complementary, alternative, or unconventional practitioner. (1)
- Other → Please specify below (1)

3. Did you look anywhere else? (mark all that apply)

- Books (1)
- Brochures, pamphlets, etc. (1)
- Family (1)
- Friend or Co-Worker (1)
- Doctor or Healthcare Provider (1)
- Internet (1)
- Library (1)
- Magazines (1)
- Telephone information number (1)
- Complementary, alternative, or unconventional practitioner. (1)
- Other → Please specify below (1)

4. Overall, how confident are you that you could get health-related advice or information if you needed it? (select one)

- Completely confident (5)
- Very confident (4)
- Somewhat Confident (3)
- A little confident (2)
- Not confident at all (1)

**Section B.** Scores can range from 0 to 11. Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). The scores will be combined with those from the scores in section A for a total health information seeking score ranging from 0 to 29. Question 2 will be used to categorically identify the primary mode of STD related health information seeking.

1. Have you ever looked for information about sexually transmitted diseases (STD) from any source? (select one)

- Yes (1)

- No (0) → Go to next Section
2. What type of information were you looking for the most recent time that you looked for information on STDs? (Mark all that apply)
- Specific STD (1)
  - Causes of STDs/Risk factors for STDs (1)
  - STD diagnosis (1)
  - Information on STDs in general (1)
  - Prevention of STDs (1)
  - Screening/Testing/Detection (1)
  - Symptoms of STDs (1)
  - Where to get treated for STDs (1)
  - Other → Please specify (1)
3. The most recent time you looked for STD information, where did you go first? (select one)
- Books (1)
  - Brochures, pamphlets, etc. (1)
  - Family (1)
  - Friend or Co-Worker (1)
  - Doctor or Healthcare Provider (1)
  - Internet (1)
  - Library (1)
  - Magazines (1)
  - Telephone information number (1)
  - Complementary, alternative, or unconventional practitioner. (1)
  - Other → Please specify below (1)

**Section C.** These questions consider access to online resources for health information. Scores range from 2 to 8 with higher numbers indicating more access. Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response).

1. Where do you use the internet? (Mark all that apply)
  - Home (1)
  - Work (1)
  - School (1)
  - Public Library (1)
  - Community Center (1)
  - Someone else's house (1)
  - Some other place (1)
  
2. When you use the internet at home how do you mainly access it? (select one)
  - Do not use the internet at home (1)
  - Telephone modem (1)
  - Cable/satellite modem (1)
  - DSL modem (1)
  - Wireless device (such as a PDA/tablet) (1)
  - Another way → Specify (1)

**Section D.** Questions 7 and 13 are 4 item Likert scale questions "strongly disagree/Never" (scored as 0) to "strongly agree/Always" (scored as 3). Questions 1-6 and 8-12 are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). This section is scaled from 0 to 38 where higher scores indicate more positive perceptions of health care.

1. Not including psychiatrists or other mental health professionals, is there a particular doctor, nurse, or other health professional that you see most often? (select one)
  - Yes (1)
  - No (0) → Go to next section
  
2. Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare? (select one)
  - Yes (1)
  - No (0)

3. The following questions are about your communication with all doctors, nurses or other health professionals you say in the past 12 months. How often did they do each of the following?

	Always	Usually	Sometimes	Never
Give you the change to ask all the health related questions	3	2	1	0
Give the attention you needed to your feelings and emotions	3	2	1	0
Involve you in decisions about your health care as much as you wanted	3	2	1	0
Make sure you understood the things you needed to do to take care of your health	3	2	1	0
Help you deal with feelings of uncertainty about your health or health care	3	2	1	0

4. In the past 12 months, how often did you feel you could rely on your doctors, nurses, or other health professionals to take care of your health needs? (select one)

- Always (3)  
 Usually (2)  
 Sometimes (1)  
 Never (0)

5. Overall, how would you rate the quality of health care you received in the past 12 months? (select one)

- Excellent (4)  
 Very good (3)  
 Good (2)  
 Fair (1)  
 Poor (0)

6. In the past 12 months, have you talked to doctor, nurse, or other health professional about any kind of health information you have gotten from the internet? (select one)

- Yes (1)  
 No (0) → go to next question

7. Overall, how confident are you about your ability to take good care of your health?  
(select one)
- Completely confident (4)
- Very confident (3)
- Somewhat confident (2)
- A little confident (1)
- Not confident at all (0)
8. Some people avoid visiting their doctor even when they suspect they should. Would you say this is true or not true for you? (select one)
- True (0)
- Not true (1)
9. Below are some reasons people give for not wanting to see their health care provider or doctor Please tell us how much you agree with each statement.

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
I avoid seeing my doctor because I feel uncomfortable when my body is being examined	1	2	3	4
I avoid seeing my doctor because I fear I may have a serious illness	1	2	3	4

**Section E.** This section represents the Risk Elements score which will be combined with the sexual risk score (Appendix F). The score ranges from 3 to 8 with higher scores representing higher risk elements.

1. How often do you now drink? (select one)
- Every day (3)
- Some days (2)
- Not at all (1)
2. How often do you now engage in illicit drug use? (select one)
- Every day (3)
- Some days (2)
- Not at all (1)

3. Do you believe that alcohol and drug use puts you at increased risk for contracting an STI? (select one)

Yes (1)

No (2)

Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response)

**Section F.** Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). Scores range from 0 to 10 with higher scores corresponding to higher levels of STD knowledge as it pertains to prevention and treatment.

1. Do you think that condoms can prevent STDs? (select one)

Yes (5)

No (0)

2. Do you think that STDs can go away on their own without treatment? (select one)

Yes (0)

No (5)

**Section H:** Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). Question 3 is a 4 Item Likert scale question scored from Strongly disagree (0) to Strongly agree (3) for the first two responses and Strongly disagree (3) to Strongly agree (0) for the last responses. Scores range from 2 to 21 with higher scores indicating higher levels of STD concern.

This section contains several questions about STDs. For each, try to think about STDs in general when answering.

1. How likely do you think it is that you will contract an STD in the future? (select one)

Very low (1)

Somewhat low (2)

Moderate (3)

Somewhat high (4)

Very high (5)

2. How often do you worry about getting an STD? (select one)

Rarely or never (1)

- Sometimes (2)  
 Often (3)  
 All the time (4)

3. How much do you agree or disagree with the following statements?

	Strongly agree (3)	Somewhat agree (2)	Somewhat disagree (1)	Strongly disagree (0)
STDs are most often caused by a persons behavior or lifestyle	3	2	1	0
Getting screened for STDs if having unprotected intercourse is important in preventing their spread	3	2	1	0
People can tell that they may have an STD before diagnosis because of symptoms	0	1	2	3
There's not a lot you can do to prevent STDs	0	1	2	3

**Section I:** Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). Scores in this section range from 0 (those with no STD history to 12 (those with a prior diagnosis)

- Have you ever been told by a healthcare provider that you tested positive for an STD (i.e., chlamydia, gonorrhea, human papillomavirus (HPV), HIV/AIDS, genital herpes, syphilis, bacterial vaginosis etc.) (select one)
  - Yes (1)
  - No (0) → continue to next section
- What STD(s) were you diagnosed with? (mark all that apply)
  - Chlamydia (1)
  - Gonorrhea (1)
  - HIV/AIDS (1)
  - Bacterial vaginosis (1)
  - Syphilis (1)
  - Mycoplasma hominis (1)
  - Mycoplasma genitalium (1)
  - Trichomonas (1)

- Hepatitis, viral (1)
- Genital herpes (1)
- Human papillomavirus (HPV) (1)

## Appendix E: Marin County Health Department Permission to Utilize Survey



DEPARTMENT OF HEALTH AND HUMAN SERVICES  
**PUBLIC HEALTH SERVICES**

Promoting and protecting health, wellbeing, self-sufficiency, and safety of all in Marin County.



October 27, 2015

Grant Nash Colfax, MD  
DIRECTOR

To Whomever This Concerns,

Matthew Willis, MD, MPH  
PUBLIC HEALTH OFFICER

Lisa M. Santora, MD, MPH  
DEPUTY PUBLIC HEALTH OFFICER

I give permission to Amanda Robison-Chadwell to use HHS Health Clinics sexual risk assessment for her dissertation. We are happy to share our form with her.

HHS Health Clinics  
3260 Kerner Boulevard  
San Rafael, CA 94901  
415 473 4400 T  
415 473 4018 F  
415 473 3344 TTY  
[marinhhs.org/health-clinics](http://marinhhs.org/health-clinics)

Sincerely,

Martha Nelken RN, BSN  
Nursing Services Manager  
HHS Health Clinics  
County of Marin

**Appendix F: STD Risk Assessment Questionnaire:** Questions are multiple choice questions which will be coded numerically for analysis (see the parenthetical code following the response). Scores range from 3 to 45. Combine with Section E for a score range from 3 to 53.

1. Have you been seen in an STD clinic before? (select one)
  - a. Yes (1)
  - b. No (0)
  
2. What was the reason for visiting an STD clinic? (check all that apply)
  - a. Have symptoms (5)
  - b. Think you could be at risk for an STD/HIV (5)
  - c. No symptoms –STD testing/screening only (1)
  - d. Someone told you to come today (2)
  - e. Referred by another doctor or clinic (3)
  - f. Other (0)
  
3. Have you had sexual intercourse (vaginal, oral, or anal intercourse) in the last 6 months?  
(select one)
  - a. Yes (1)
  - b. No (0)
  
4. When with new or non-steady partners, do you use a condom or barrier? (select one)
  - a. Always (1)
  - b. Most of the time (2)
  - c. Sometimes (3)
  - d. Rarely (4)
  - e. Never (5)
  
5. Have you ever exchanged drugs/money for sex?
  - a. Yes (1)
  - b. No (0)

\*Research has indicated that these behaviors demonstrate potentially high STD risk.

6. Have you ever engaged in sexual intercourse with a partner with a recent history of incarceration?
  - a. Yes (1)
  - b. No (0)

\* Research has indicated that these behaviors demonstrate potentially high STD risk.

7. Do you smoke cigarettes?

Yes (1)

No (0)

\* Research has indicated that these behaviors demonstrate potentially high STD risk.

8. Have you had sex with: (select one)

A man (1)

A woman (1)

Both (1)

Other (1)

9. Have you had sex with someone you know injects recreational drugs? (select one)

Yes (1)

No (0)

10. Have you had sex with someone you know has any other STD? If yes, which STD (select all that apply)

Chlamydia (1)

Herpes (1)

Trichomonas (trich) (1)

Gonorrhea (1)

NGU/NSU (1)

HIV (1)

HIV (use of Assisted Reproductive tech and condom use) (0)

Genital Warts (1)

Syphilis (1)

Other not listed: (fill in) (1)

Do not know (1)

11. Have you ever been diagnosed with an STD? (mark all that apply)

- Chlamydia (1)
- Herpes (1)
- Trichomonas (trich) (1)
- Gonorrhea (1)
- NGU/NSU (1)
- HIV (1)
- Genital Warts (1)
- Syphilis (1)
- Other not listed: (fill in) (1)
- None of the above (1)
- Never been diagnosed with an STD (0)

12. Have you ever been diagnosed with an STD more than 1 time? If yes, check all that apply

below (mark all that apply)

- Chlamydia (1)
- Herpes (1)
- Trichomonas (trich) (1)
- Gonorrhea (1)
- NGU/NSU (1)
- HIV (1)
- Genital Warts (1)
- Syphilis (1)
- Other not listed: (fill in) (1)
- Never been diagnosed with a particular STD more than 1 time (0)

13. What is your primary reason for using condoms? (select one)

- STD prevention (2)
- Pregnancy prevention (1)
- Do not use condoms (0)

## Appendix G. Guttmacher Institute State Policies in Brief as of November 1, 2015

GUTTMACHER INSTITUTE

# STATE POLICIES IN BRIEF As of NOVEMBER 1, 2015

## Sex and HIV Education

**BACKGROUND:** Beginning in the 1970s, concerns over teen pregnancy– and later HIV/AIDS– galvanized widespread public support for sex education in schools. Most states today have a policy requiring HIV education, usually in conjunction with broader sex education. Meanwhile, as debate over the relative merits of abstinence-only-until-marriage versus more comprehensive approaches has intensified, states have enacted a number of specific content requirements. This brief summarizes state-level sex and HIV education policies, as well as specific content requirements, based on a review of state laws, regulations and other legally binding policies.

### HIGHLIGHTS:

#### *General Requirements: Sex Education and HIV Education*

- 22 states and the District of Columbia mandate sex education.
  - 20 states and the District of Columbia mandate both sex education and HIV education.
  - 2 states only mandate sex education.
- 33 states and the District of Columbia mandate HIV education; of these states, 13 mandate only HIV education.
- 27 states and the District of Columbia mandate that, when provided, sex and HIV education programs meet certain general requirements.
  - 13 states require that the instruction be medically accurate.
  - 26 states and the District of Columbia require that the information be appropriate for the students' age.
  - 8 states require that the program must provide instruction that is appropriate for a student's cultural background and not be biased against any race, sex or ethnicity.
  - 2 states prohibit the program from promoting religion.
- 37 states and the District of Columbia require school districts to involve parents in sex education, HIV education or both.
  - 22 states and the District of Columbia require that parents be notified that sex education or HIV education will be provided.
  - 3 states require parental consent for students to participate in sex education or HIV education.
  - 35 states and the District of Columbia allow parents to remove their children from instruction.



Advancing sexual and reproductive health worldwide through research, policy analysis and public education.

125 Maiden Lane  
New York, NY 10038  
212.248.1111  
www.guttmacher.org  
info@guttmacher.org

1301 Connecticut Avenue, N.W.  
Washington, DC 20036  
202.296.4012  
www.guttmacher.org  
policy@guttmacher.org

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**CONTINUED**

**HIGHLIGHTS:***Content Requirements When Sex Education is Taught*

- 18 states and the District of Columbia require that information on contraception be provided.
- 37 states require that information on abstinence be provided.
  - 25 states require that abstinence be stressed.
  - 12 states require that abstinence be covered.
- 19 states require that instruction on the importance of engaging in sexual activity only within marriage be provided.
- 13 states require discussion of sexual orientation.
  - 9 states require that discussion of sexual orientation be inclusive.
  - 4 states require only negative information on sexual orientation.
- 13 states require the inclusion of information on the negative outcomes of teen sex and pregnancy.
- 27 states and the District of Columbia require the provision of information about skills for healthy sexuality (including avoiding coerced sex), healthy decision making and family communication when.
  - 20 states and the District of Columbia require that sex education include information about skills for avoiding coerced sex.
  - 20 states require that sex education include information on making healthy decisions around sexuality.
  - 11 states require that sex education include instruction on how to talk to family members, especially parents, about sex.

*Content Requirements When HIV Education is Taught*

- 19 states require information on condoms or contraception.
- 39 states require that abstinence be included.
  - 27 states require that abstinence be stressed.
  - 12 states require that abstinence be covered.

**CONTINUED**

<b>GENERAL REQUIREMENTS: SEX AND HIV EDUCATION</b>									
STATE	SEX EDUCATION MANDATED	HIV EDUCATION MANDATED	WHEN PROVIDED, SEX OR HIV EDUCATION MUST:				PARENTAL ROLE		
			Be Medically Accurate	Be Age Appropriate	Be Culturally Appropriate and Unbiased	Cannot Promote Religion	Notice	Consent	Opt-Out
Alabama		X		X					X
Arizona				X			HIV	Sex	HIV
Arkansas									
California		X	X	X	X	X	X		X
Colorado			X	X	X		X		X
Connecticut		X							X
Delaware	X	X							
Dist. of Columbia	X	X		X			X		X
Florida				X					X
Georgia	X	X					X		X
Hawaii			X	X					
Idaho									X
Illinois <sup>†</sup>		X	X	X					X
Indiana		X							
Iowa	X	X	X	X	X		X		X
Kentucky	X	X							
Louisiana				X		X	X		X
Maine	X	X	X	X					X
Maryland	X	X							X
Massachusetts							X		X
Michigan		X	X <sup>‡</sup>	X			X		X
Minnesota	X	X							X
Mississippi <sup>‡</sup>	X			X			X		X
Missouri		X		X			X		X
Montana	X	X							
Nevada	X	X		X			X	X	
New Hampshire		X							X
New Jersey	X	X	X	X	X		X		X
New Mexico	X	X							X
New York		X		HIV					HIV
North Carolina	X	X	X	X					
North Dakota	X								
Ohio	X	X							X
Oklahoma		X					X		X
Oregon	X	X	X	X	X		X		X
Pennsylvania		X		HIV			X		HIV
Rhode Island	X	X	X	X	X				X
South Carolina	X	X		X			X		X
Tennessee	X <sup>¶</sup>	X		HIV					X
Texas				X			X		X
Utah <sup>§</sup>	X	X	X		X		X	X	
Vermont	X	X		X					X
Virginia				X			X		X
Washington		X	X	X	X		X		X
West Virginia	X	X					X		X
Wisconsin		X					X		X
<b>TOTAL</b>	<b>22+DC</b>	<b>33+DC</b>	<b>13</b>	<b>26+DC</b>	<b>8</b>	<b>2</b>	<b>22+DC</b>	<b>3</b>	<b>35+DC</b>

\* Sex education typically includes discussion of STIs.

† Sex education is not mandatory, but health education is required and it includes medically accurate information on abstinence.

‡ Sex education "shall not be medically inaccurate."

§ Localities may include topics such as contraception or STIs only with permission from the State Department of Education.

¶ Sex education is required if the pregnancy rate for 15-17 teen women is at least 19.5 or higher.

§ State also prohibits teachers from responding to students' spontaneous questions in ways that conflict with the law's requirements.

**CONTINUED**

<b>CONTENT REQUIREMENTS FOR SEX* AND HIV EDUCATION</b>										
<b>STATE</b>	<b>WHEN PROVIDED, SEX EDUCATION MUST</b>							<b>WHEN PROVIDED, HIV EDUCATION MUST</b>		
	<b>Include Information on:</b>					<b>Include Life Skills for:</b>			<b>Include Information on:</b>	
	<b>Contra-ception</b>	<b>Abstinence</b>	<b>Importance of Sex Only Within Marriage</b>	<b>Sexual Orientation</b>	<b>Negative Outcomes of Teen Sex</b>	<b>Avoiding Coercion</b>	<b>Healthy Decision-making</b>	<b>Family Communication</b>	<b>Condoms</b>	<b>Abstinence</b>
Alabama	X	Stress	X	Negative	X	X		X	Stress	
Arizona		Stress		†	X	X			Stress	
Arkansas		Stress	X			X			Stress	
California	X	Cover		Inclusive			X	X	Cover	
Colorado	X	Cover		Inclusive		X	X	X	Cover	
Delaware	X	Stress		Inclusive		X	X	X	Stress	
Dist. of Columbia	X					X				
Florida		Stress	X		X				Stress	
Georgia		Stress	X		X				Cover	
Hawaii	X	Cover						X	Stress	
Illinois	X	Stress	X		X	X		X	Stress	
Indiana		Stress	X						Stress	
Iowa				Inclusive						
Kentucky		Cover			X		X		Cover	
Louisiana		Stress	X						Stress	
Maine	X	Stress					X	X	Stress	
Maryland	X	Cover				X	X	X	Cover	
Michigan		Stress	X		X	X	X		Stress	
Minnesota		Cover					X		Cover	
Mississippi <sup>‡</sup>	†	Stress	X		X	X			Stress	
Missouri		Stress	X		X	X	X		Stress	
Montana		Cover							Cover	
New Hampshire									Cover	
New Jersey	X	Stress		Inclusive			X	X	Stress	
New Mexico	X	Cover		Inclusive		X	X	X	Stress	
New York								X	Stress	
North Carolina	X	Stress	X			X	X	X	Stress	
North Dakota		Cover								
Ohio		Stress	X		X				Stress	
Oklahoma		Stress		‡				X	Cover	
Oregon	X	Stress		Inclusive		X	X	X	Stress	
Pennsylvania									Stress	
Rhode Island	X	Stress		Inclusive		X	X	X	Stress	
South Carolina	X	Stress	X	Negative					Stress	
Tennessee		Stress	X		X	X	X	X	Stress	
Texas		Stress	X	Negative	X	X	X	X	Stress	
Utah <sup>§</sup>		Stress	X	Negative		X	X	X	Stress	
Vermont	X	Cover				X	X	X	Cover	
Virginia	X	Cover	X			X	X	X	Cover	
Washington	X	Stress		Inclusive			X	X	Stress	
West Virginia	X	Cover	X		X	X	X	X	Cover	
Wisconsin		Stress	X						Stress	
<b>TOTAL</b>	<b>18+DC</b>		<b>19</b>	<b>12</b>	<b>13</b>	<b>20+DC</b>	<b>20</b>	<b>11</b>	<b>20</b>	

\* Sex education typically includes discussion of STIs.

† If HIV education is taught in Arizona it cannot "promote" a "homosexual lifestyle" or portray homosexuality in a positive manner. Mandated HIV education in Oklahoma teaches that among other behaviors that "homosexual activity" is considered to be "responsible for contact with the AIDS virus."

‡ Localities may include topics such as contraception or STIs only with permission from the State Department of Education.

§ State also prohibits teachers from responding to students' spontaneous questions in ways that conflict with the law's requirements.

CONTINUED

**FOR MORE INFORMATION:**

For information on state legislative and policy activity, click on Guttmacher's [Monthly State Update](#), for state-level policy information see Guttmacher's [State Policies in Brief](#) series, and for information and data on reproductive health issues, go to Guttmacher's [State Center](#). To see state-specific reproductive health information go to Guttmacher's [Data Center](#), and for abortion specific information click on [State Facts About Abortion](#). To keep up with new state relevant data and analysis sign up for the [State News Quarterly Listserv](#).

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## Appendix H: Informed Consent Letter

### Informed Consent

Hello and welcome to the U.S. Young Adults STDs, Risk Perception, Risk Behaviors, and Health Information Seeking Study!

You are invited to participate in a research project about sexually transmitted diseases (STDs) in U.S. young adults including risk perception, risk behaviors, and health information seeking. This study is collecting data from Americans aged 20 to 29 years. Questions will be about sexual risk behaviors, how you seek information about health, your condom use patterns, and sexually transmitted disease history. The surveys are anonymous which means that no information will be asked which can identify an individual. In the event that you have any questions contact the Walden University IRB (see contact information below). Once submitted it cannot be withdrawn. Any partially completed surveys will be deleted and the data not submitted for inclusion in the study – so please answer each question asked. You may stop any time you want, but if you do not complete the survey, the answers you have provided will be deleted and not included in the study. This online survey should take about 20 to 30 minutes to complete. Participation is voluntary, and responses will be kept anonymous. All data is protected and stored by SurveyMonkey (information about their data protection procedures can be found here: <https://www.surveymonkey.com/mp/take-a-tour>) and analysis will be conducted on the researchers computer which is password protected. Your name and other identifying information will not be required.

You have the option to not respond to any questions that you choose but lack of response may result in your survey being dropped from the study. Whether you decide to volunteer to be in the study or not is up to you. There are no inherent risks or benefits to participation beyond the societal benefits that may be provided. By clicking on the “I Agree” button at the end of this section you affirm your consent to participate and that you fit the criteria for participation in the study.

If you have any questions about the survey please first view the Frequently Asked Questions (FAQ) document as your questions may be answered there. For any additional questions regarding your rights as a research subject, contact the Walden University Institutional Review Board (IRB) at [irb@waldenu.edu](mailto:irb@waldenu.edu). The study results will be shared on the social media pages where they were advertised and students may also contact Walden University for information about the study results.

Please download and print or save a copy of this page for your records.

## **Appendix I: Frequently Asked Questions Document**

1) What is the purpose of this research?

this is research being conducted for a PhD dissertation study by a student at Walden University. This quantitative study focuses on sexually transmitted infection (STI) risk thought and behavior and the association with health information seeking in young adults.

2) What is the condom use self-efficacy scale (CUSES)?

The condom use self-efficacy scale is used to determine an individual's level of comfort with the use of condoms and with their level of comfort negotiating use of condoms.

3) Where can I find more information about STDs?

More information on STDs can be found on the Centers for Disease Control (CDC) website at <http://www.cdc.gov/std/>.

4) Why is my race/ethnicity required?

Race/ethnicity and gender variables are used to describe the population that responds to the survey.

5) What if I have questions for the researcher? Will my survey still remain anonymous if I contact him/her?

No, anonymity will have been violated and any contact with the researcher will result in removal from the study.

6) Is SurveyMonkey® secure for me to use?

SurveyMonkey uses data security procedures that keep data protected when stored.

Information about data security can be found at:

[https://www.surveymonkey.com/mp/take-a-tour/?ut\\_source=header](https://www.surveymonkey.com/mp/take-a-tour/?ut_source=header)

7) How will this information be used?

The information from completed surveys will be analyzed for use in a dissertation study in order to better understand the risk behaviors, perceived risk, and health information seeking behaviors of young adult participants.

8) How can I get access to the results of this study?

The results of this study will be made available online to participants via the social media platforms used to distribute the survey. Once the study has been completed participants can also contact Walden University via contact information in the informed consent document for access to the published research.

9) Will I get anything for my participation?

There is no incentive or reward for participation in this study. However the research being conducted can be beneficial to the community at large.

10) What is an IRB?

An Institutional Review Board (IRB) is a group made of professionals in their field and typically associated with an institution that monitors research. Their focus is to review research to ensure that it is done safely and that the benefits of that research outweigh any risks to participants. IRBs follow rules set down by the federal government, the U.S. Department of Health and Human Services (DHHS) and the Food and Drug Administration (FDA).

## Appendix J: Validity and Reliability of the Sexual Health Risk Assessment



**Jimenez, Juan** <JJimenez@marincounty.org>  
to me ▾

Jan 8 (3 days ago) ☆



Hi Amanda, the risk assessment has never been used for data collection in any published academic studies. I am not sure about reliability and validity ever been tested as parts of the risk assessment come from a risk assessment put together by office of aids to capture HIV risks. Thanks.

Juan Jimenez - PHI

**Appendix K: Visual Results from Data Analysis**