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An Assessment of Sexually Transmitted Disease Knowledge Among 7th Grade Students

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This is to certify that the doctoral dissertation by

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Abstract

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MA, Antioch University 2002

BA, University of North Carolina, Chapel Hill 1993

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Sexually transmitted diseases (STDs) continue to remain a public health concern in the United States, especially among young people. Levels of knowledge with regard to STDs have been investigated in prior research; however, these investigations have been limited primarily to older adolescents and young adults. Grounded in the social cognitive and subjective culture theories, this quantitative, cross-sectional study assessed STD knowledge (other than HIV/AIDS) among 7th grade students attending a public middle school in the United States. Demographic differences (age, gender, and ethnicity) in STD knowledge were examined to determine if these demographic variables predict STD knowledge scores and if the Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ) is a valid and reliable instrument among this study population. Chi-square analysis demonstrated that STD knowledge scores significantly differed by age only: Twelve-year-olds had higher STD scores than did 13-year-olds, contrary to research in older adolescents, which may be the result of confounding factors that warrant further investigation. Multiple regression analysis showed that age, gender, and ethnicity were not associated with STD knowledge scores. The STD-KQ was found to have face validity as well as high consistency and reliability among all questions related to STDs other than HIV/AIDS using Crohnbach's alpha. Content validity for individual STD-KQ items was shown using Lawshe's content validity ratio and subject matter experts. Results of the study support positive social change and highlight the need for earlier STD education, other than HIV/AIDS, with middle school children and the need to examine other factors that may impact STD knowledge within this age group.

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Dedication

This dissertation is dedicated to my beautiful daughter, Maddison Boxley. I hope this dissertation inspires her to become a great woman of color who believes she can be whatever she chooses to be in life. She was very young when I started the Ph.D. process and often times did not understand why mommy didn't have time to play.

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Chapter 1: Introduction to the Study

Background

Sexually transmitted diseases (STDs) are diseases caused by pathogens and contracted through sexual activity (intercourse and oral and anal sex). Some of the most common STDs result from bacterial (chlamydia, gonorrhea, and syphilis) and viral (HIV/AIDS, herpes, hepatitis B, human papillomavirus or HPV) exposure. In addition to bacterial and viral culprits, protozoa and fungi also cause STDs, including those that cause trichomonas vaginitis and jock itch, respectively (Shim, 2011). Despite dramatic reductions in STD rates since World War II, STDs remain a significant health issue in the United States and other developing countries (Shim, 2011). Sexually transmitted infections (STIs) according to some health care clinics are interchangeable with STDs; however, others believe that STIs are the precursor to STDs because they are caused by the same pathogens but are at a stage where no symptoms are present in the host (University of Alabama Student Health Center, n.d.; University of Wisconsin [WIRE], 2010). In addition, STI is used as a more current term and may be less embarrassing to a patient upon diagnosis compared to using the term disease (WIRE, 2010). In this dissertation and research, I will use the term STDs because the instrument being used in the research specifically measures STD knowledge.

STDs impact the cost of health care in the United States with over 16 billion dollars being spent annually to diagnose and treat those infected. This financial burden is further compounded by the long term effects of STDs on health, including pelvic inflammatory disease and infertility, as well as those infected having an increased

susceptibility to HIV/AIDS (Centers for Disease Control and Prevention [CDC], 2012a). Females are at a greater risk of contracting STDs and developing complications if infections go untreated, and often times STDs do not present symptoms in males or females, which leads to increased transmission and greater susceptibility to other types of infections (Upchurch, Mason, Kusunoki, & Kriechbaum, 2004; Weinstock, Berman, & Cates Jr., 2004). Prevalence and incidence rates are a result of STD reporting by public and private healthcare facilities, and not all STDs are required to be reported by law (Weinstock et al., 2004). The fact that some individuals remain asymptomatic and others go undiagnosed, despite the presence of symptoms, leads to false estimates of disease rates, which may significantly underrepresent the true burden of disease (CDC, 2012).

In this study, I assessed the level of STD knowledge among seventh grade students. The need for studies of this kind is paramount because a majority of new cases of STDs occur among adolescents, especially those belonging to minority groups. A major key to solving poor adolescent health and social outcomes has transitioned from risk-based approaches to increasing protective factors such as avoidance of sexual risk and illegal drugs, while promoting positive development across a variety of areas including but not limited to emotional and educational growth (Viner et al., 2012). The implications for positive social change of this study are to support the belief that sexual education beyond HIV/AIDS must occur at earlier ages in an attempt to educate children before they initiate sexual activity and thwart the rise in STDs in adolescence as well as provide support in demonstrating the lack of STD education and research among this age

group despite the fact that the age of onset of sexual activity is occurring earlier than expected (Carminis, Henrich, Ruchkin, Schwab-Stone, & Martin, 2007).

In this chapter, I will provide the problem statement that describes the significance of the problem, the relevance of the study, and gaps in the literature, the purpose of the study, the research questions addressed in the current study, the theoretical foundation of the current study, the rationale and study design, key concepts and definitions, assumptions and limitations of the current research, and the significance this study has in the discipline of social phenomena and research.

Problem Statement

It is estimated that 12 million individuals are affected by STDs globally each year (Shim, 2011), and in the United States alone, it is estimated that 19 million new infections are diagnosed each year, with half of new infections occurring in young people age 15 to 24 (CDC, 2012a). In 2009, one study conducted by the CDC, which included over 800 girls age 14 to 19, found that 1 out of 5 contracted an STD within 1 year of onset of sexual activity. Given that the youth represent the greatest burden of disease and with the onset of sexual activity occurring at younger ages (Lohman & Billings, 2008), the nation must take responsibility to get over the fear of educating children at earlier ages about the risks and consequences of sex and teach them to make protective and wise choices about their health (CDC, 2010).

An increase in the casualness of sex including more sexual partnering and the discovery of social media play a role in youth exploration of sex and the ability to communicate with more potential partners over larger geographic locations and at

younger ages (Maticka-Tyndale, 2008). The average age of sexual debut was found to be 13 for boys and 14 for girls (Rothenberg, Dan My Hoang, Muth, & Crosby, 2007); however, several other studies have found that these ages can vary by as much as 2 years, and even occurring at the age of 9 years old in one study participant (Senn & Cary, 2011; Zwane, Mngadi, & Nxumalo, 2004). In an effort to help reduce the burden of increased STD incidence and poor health outcomes among youth, it is necessary to demonstrate the need for earlier implementation of STD education. Earlier implementation of STD education can potentially reduce transmission and contraction of diseases, and research studies conducted among younger children can provide evidence of the existing lack of knowledge about STDs and sexual health among younger populations (CDC, 2010; Ott & Pfeiffer, 2009; DeRosa et al., 2010). Ott and Pfeiffer (2009) believed that STD education should be guided by how inquisitive children are with regard to sex and if the child is curious or views sexual relationships as unappealing. DeRosa et al. (2010) asserted that sexual education should begin in elementary school and continue throughout a child's middle school years. With regard to STD knowledge, prior research has demonstrated that younger age groups have lower knowledge scores (Andersson-Ellström & Milsom, 2002) and that more is known about HIV/AIDS than any other STDs, despite high rates of exposure (Anwar, Sulaiman, Ahmadi, & Khan, 2010). In this research study, I seek to explore the level of STD knowledge among a group of students who have been less commonly examined in prior research with the hope of expanding sexual education curricula to include the major STDs other than HIV/AIDS and increase awareness and protective behaviors.

Purpose of the Study

Targeting children and early adolescents, even those who are not at high risk or economically disadvantaged, prior to the onset of sexual activity or sexual experimentation can lead to prevention of poor health outcomes. Early adolescence is a period of transition and behaviors associated with this period can be negative or positive (Carlo, Fabes, Laible, & Kupanoff, 1999). Because sexual experimentation is occurring at earlier ages, the implementation of preventive and protective measures should be initiated as early as possible and have been shown by some researchers to decrease high risk behavior later on in adolescence (Busen, Marcus, & von Sternberg, 2006). Adolescents make up the second largest group contracting chlamydia and gonorrhea, and these rates may not contain all cases given the nature of these diseases and the possibility of delayed symptoms and treatment (CDC, 2011).

This quantitative research study assessed the levels of STD knowledge, other than HIV/AIDS, among seventh graders attending public school. STD knowledge was assessed via the 27-item Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ; Jaworski & Carey, 2007), and this study also assessed if any gender, age, and ethnic differences existed in levels of STD knowledge. The STD-KQ consists of 27 items used to measure knowledge of STDs by including up to date, comprehensive questions that focus on the some of the primary STDs that currently present public health concerns. The STD-KQ has been used to assess STI knowledge among African American adolescents aged 13 and older (a 10-item subset of questions were used; Swenson et al., 2009), men having sex with men in Massachusetts (Mimiaga et al., 2009), and a subset of questions

from the STD-KQ were used among adult STD clinic patients (Scott-Sheldon et al., 2010). I also sought to validate the use of the STD-KQ in this population contrary to what populations have been used in past research.

Research Questions and Hypotheses

The research questions and related hypotheses are listed below. A more in-depth description of the independent and dependent variables and how they were analyzed are presented in Chapter 3.

Research Question 1:	Is the STD-KQ a valid and reliable measurement tool of STD knowledge among seventh grade students?
Research Question 2:	Are there differences in STD knowledge scores among seventh grade students with regard to gender, age, and ethnicity?
$H_0$2:	Differences do not exist in STD knowledge scores based on gender, age, and ethnicity.
H_a2:	STD knowledge scores will be higher among females than among males; STD knowledge scores will be higher among 13 year olds; STD knowledge scores will be higher among minority (African-American/Hispanic) students versus nonminority students (non-African-American/non-Hispanic).
Research Question 3:	Do gender, age, and ethnicity predict STD knowledge among seventh grade students?

$H_0$3: Gender, age, and ethnicity do not predict STD knowledge scores among seventh graders.

H_a3: Gender, age and ethnicity predict STD knowledge scores among seventh graders.

Theoretical Framework

An integrative theoretical approach was used in this research study and includes social cognitive theory in addition to subjective culture theory to examine the foundation of behavior and human interaction, beliefs, and attitudes. Social theories have been widely used to identify factors for high risk sexual behaviors as well as what social factors influence sexual health and learning (Teitelman, Bohinski, & Boente, 2009). Adolescence is an opportune time to examine sexual activity because much activity begins in middle school (Guilamo-Ramos et al., 2008), and it is this time (ages 11-14) that serves as the initiation of the transition from childhood to young adulthood, marked by vulnerability to physical, social, cognitive, and emotional changes (Busen et al., 2006). Social cognitive theory is based on the idea that behavior is imitated and influenced by several factors, including the environment and cognitive learning through observation (Bandura & McDonald, 1963) and serves as a suitable framework to assess STD knowledge among this study population. In conjunction, subjective culture theory asserts that social interaction, beliefs, and attitudes influence behavior and that behavior is impressionable depending upon the interaction and roles acquired by cultural and social members (Triandis & Malpass, 1970). Both theoretical frameworks were

interactively used to examine ethnic and gender differences in levels of STD knowledge in this study.

Nature of the Study

In this quantitative study, I sought to determine the STD knowledge level among a sample of seventh graders in the United States. The key variables in this study are STD knowledge score, which is the dependent variable, provided as an overall score ranging from 0 to 27 and categorized as low, medium, or high based on the number of correct answers provided in the STD-KQ (Jaworski & Carrey, 2007), and demographic differences (gender, age, ethnicity) in STD knowledge scores, which are the independent variables. The percentage of "Don't Know" responses in the STD-KQ is also a dependent variable that was used to assess the adequacy of the STD-KQ as a measure of knowledge among this population.

Using a cross-sectional research method, the STD-KQ (Jaworski & Carrey, 2007) was administered via Internet to 207 seventh grade students attending public school in the United States. Data were analyzed using descriptive statistics, Chi-square tests, and multiple regression.

Variables and Definitions

The variable examined in this research study requiring a concise definition is listed and defined below. How this variable was analyzed is explained in more detail in Chapter 3:

STD knowledge: STDs constitute physical and laboratory abnormalities caused by certain pathogens and are contracted through sexual contact (Shim, 2011). STD

knowledge is the degree of knowledge with regards to STD transmission, signs and symptoms, and treatment available as measured by the 27-item STD-KQ (Jaworski & Carrey, 2007). The STD knowledge score is the dependent variable and possible scores range from 0 to 27. STIs are commonly defined as the precursor to the presence of physical symptoms or disease; however, STIs are caused by the same pathogens as STDs (University of Alabama Student Health Center, n.d.; WIRE, 2010). For the purposes of this research study, the term and definition of STDs was used.

Assumptions

Based on prior research on STDs and sexual health among adolescents as indicated in Chapter 2, the following assumptions were made:

1. Promoting sexual health and responsible sexual behavior as a foundation for adolescent health consists of having the ability to comprehend and consider the risks involved as well as accountability, consequences, and impact of sexual activity (Teitelman et al., 2009).
2. Identifying and recognizing high risk behavior in early adolescence is needed prior to the start of harmful consequences to children and their families becoming irreversible (Busen et al., 2006).
3. Given the amount of time that children spend in school, schools have a very important impact on adolescent development and can affect the likelihood of high risk behavior and age of sexual debut (Upchurch, Mason, Kusunoki, & Kriechbaum, 2004).

4. If protective and preventive measures as well as sexual education improvements are not implemented at younger ages, the incidence of STDs will continue to rise among adolescents aged 15 to 19.

Scope and Delimitations

The scope of this study was to measure the STD knowledge among seventh graders whose ages ranged from 12 to 13 years old. As discussed in the problem statement, the second highest incidence of chlamydia and gonorrhea occur between the ages of 15 and 19, and prior research has implied that younger children must be educated earlier about STDs and protective behavior in an attempt to thwart these high disease rates. In this study, I seek to expand upon prior recommendations to involve younger children in educational efforts by assessing what they know and do not know about STDs other than HIV/AIDS, which has been the disease focus among current sexual education curricula occurring during adolescence.

The study population has been delimited to only seventh graders because the majority of prior research has occurred among adolescents aged 13 to 18. Significant changes in sexual initiation and behavior occur between seventh and eighth grade, and early intervention is recommended primarily among sixth and seventh graders before sexual activity begins (Guilamo-Ramos et al., 2008). According to Markham, Fleschler-Peskin, Addy, Baumler, and Tortolero (2009), more males are reporting initiation of vaginal and anal sex before age 11, younger adolescents are engaging in sexual activity with multiple partners as much as their older counterparts (Exavery et al., 2011), and

sexual interactions between boys and girls increase significantly beginning with the fifth grade and continue throughout high school (Braxter, Doswell, & Ren 2011).

Limitations

One of the limitations of this study was that only seventh grade students were included in the research, which may have impacted the results based on ethnic makeup and geographical location. This limitation will be adequately discussed in Chapter 5, and the impact on the study results will be considered and documented. The second limitation of this study was the use of a sensitive questionnaire. Even though there are no right and wrong answers, participants may view the questions as embarrassing, which may affect their willingness to answer correctly for fear of knowing too much at such a young age. By ensuring participant confidentiality, this limitation was addressed, and the validity of the data potentially improved. Lastly, the inability to verify that all Internet survey respondents were actually seventh grade students is a limitation that cannot be addressed, only documented in Chapter 5.

Significance of the Study

Adolescents represent the second highest group contracting chlamydia and gonorrhea out of all age groups, and this phenomenon has been increasing steadily, especially for chlamydia, and has remained disproportionate in the United States over the last decade (CDC, 2011). These increasing rates provide evidence that there is a need for improvements in preventive and protective measures, starting with educational efforts and lack of collaboration between schools, healthcare workers, peers, and families. These rates do not even take into account the cases that are unreported, thus increasing these

numbers of disease to even higher. Sexual education in public schools does attempt to teach adolescents about abstinence and with regard to comprehensive curricula about HIV/AIDS. However, much more is needed to combat the array of more common STDs such as chlamydia and gonorrhea, and these efforts must begin sooner rather than later. There is a need for research that assesses levels of STD knowledge among younger children in an attempt to provide evidence of a need for improvement and implementation of enhanced sexual education curricula as well as to gain support for such implementation. This study addressed the gap in the literature and contributed to positive social change by providing additional support towards the needs required to lower STD rates among adolescents and improve their level of STD knowledge and protective sexual behavior while seeking to incorporate these protective and preventive measures at younger ages.

Summary

Adolescent sexual behavior is a past and present phenomenon that often results in poor health outcomes, mainly STDs and pregnancy. Adolescents make up the group with the second highest incidence of certain STDs, and these diseases can leave them vulnerable to other diseases such as HIV/AIDS. Due to adolescents engaging in high risk behaviors such as early sexual debut, unprotected sex, and multiple sex partners, they are experiencing diseases and poor health outcomes at significantly greater rates than any other group. In order to support the positive changes that can be implemented at earlier ages, an integrative approach was used to assess levels of STD knowledge using social cognitive and subjective culture theory. In this chapter, I presented the background of the

STD problem in the United States among youth as well as the nature and purpose of this study. In Chapter 2, I review the available literature addressing the problem, discuss theoretical frameworks used in past research and what was used in this research, and examine independent variables that were also used in this research.

Chapter 2: Literature Review

STD Knowledge and Sexual Behaviors Among Preteens

The level of knowledge about STDs and the types of sexual risk behaviors engaged in by youth in the United States as well as in other countries have been researched and documented rather extensively. Research of these phenomena varies by constructs used to define levels of knowledge and by the types of sexual risk behavior being examined. In addition, multiple theoretical frameworks, demographics, and environmental and social aspects have been interpreted in an attempt to rationalize why certain variables seem to influence sexual behaviors both positively and negatively, and why differing levels of sexual knowledge exist, respectively. This literature review indicates several theoretical perspectives that serve as a foundation for past research on STDs among young populations and demonstrates how these frameworks are connected, yielding similar outcomes. In addition, social influences in the literature such as ethnicity and gender are presented, demonstrating the importance of using social perspectives in this research and how these perspectives can lead to a positive impact on even younger populations.

The process used to identify related research and relevant theoretical frameworks included web-based peer-reviewed journal searches of social and health science journals, published between 2000 to 2012, using the Educational Resources Information Center (ERIC), Elton B. Stephens Company (EBSCO Host), Public/Publisher Medline (PubMed), and University of Medicine and Dentistry New Jersey (UMDNJ) publication databases. The journal publication year was expanded beyond the last 5 years due to the

recurrence of related research results, repetitive findings, and lack of literature on STDs among children under the age 12. Related literature was identified using the following keyword searches: *adolescents and STDs, children and STDs, STIs and children, STIs and adolescents, STD knowledge and adolescents, STI knowledge, sexual education, sexual attitudes and adolescents, sexual beliefs and adolescents,* and *high risk sexual behaviors among adolescents*. All database searches excluded the word *adult* in order to limit the search results to research conducted on children, adolescents, and young adults.

Theoretical Frameworks

Youth sexual behavior includes a multitude of interactions that are a part of the natural progression to adulthood, yet high risk behaviors can pose increased risks of poor health outcomes depending upon age, exposure to disease, and other undesirable circumstances. Theoretical frameworks used to examine these behaviors vary and depend upon the view of the researcher and the variables defined. Guilamo-Ramos, Jaccard, Dittus, Gonzalez, and Bouris (2008) discussed five theories described by the National Institute of Mental Health that are integrated into a single framework to examine adolescent sexual behavior: social learning theory (also known as social cognitive theory), the theory of reasoned action, self-regulation theories, theory of subjective culture, and the health belief model. The conglomeration of these theoretical approaches into an integrated network has provided researchers the ability to analyze data from overreaching variables affecting adolescent sexual behavior and social phenomena as well as a provision of a blueprint for future researchers, enabling them to further examine

the effects of proximal variables in different population subgroups (Guilamo-Ramos et al., 2008).

Social learning theory is based on the premise that behavior is imitated by observation and modeling or mimicking and is influenced both cognitively and environmentally (Bandura & McDonald, 1963). On the other hand, the theory of reasoned action assumes that behavior is controlled by the intention to perform the behavior and is influenced by personal attitudes and perceived societal norms (Busse, Fishbein, Bleakley, & Hennessy, 2010). Similarly, subjective culture theory is a theoretical approach framed by human intragroup interactions based on beliefs, attitudes, norms, and roles within each respective group and how they relate and interact with one another (Triandis & Malpass, 1970) and is comparable to self-regulation theory that describes human behavior as alterable and malleable. Self-regulation theory assumes that humans can control urges and subdue them at will, and this can occur in line with social norms, ideals, and regulations in hopes to achieve a more favorable response or behavior (Baumeister & Vohs, 2007).

Alternatively, and considerably different than the theories mentioned above, the health belief model posits that behavior can be predicted based on the individual's reasoning or belief that they are susceptible to a particular disease or event and the extent the individual is willing to go to modify negative behavior to deter disease onset. The health belief model is useful in understanding why individuals participate in potentially negative and even life threatening behaviors such as promiscuity and unprotected sex because it has no particular structure or rules that risk factors or variables must adhere to.

The individual contributing factors are examined, and their weight in predicting negative behavior is analyzed to determine risk (Nejad, Werthheim, & Greenwood, 2005). Another theory that is not included in the integrative approach but that uses similar constructs (human group interactions, familial influence) much like subjective culture theory and self-regulation theory is the ecological approach, which has also been used to explain high risk behaviors among adolescents.

The ecological approach assumes that behaviors are influenced by social and environmental systems and the interaction among these systems and the individual. These systems include but are not limited to family, self, extended family and neighborhood, peers, and sociodemographics (Bronfenbrenner, 1979). Incidentally, Caputo (2009) used an ecological approach to examine adolescent sexual debut, or initiation, among sixth to eighth graders and found that the interaction of these systems with the individual influenced the age of sexual intercourse and also had an impact on other sexual behaviors at early ages (younger than age 14), which increase adolescent risk of disease and negative outcomes (e.g., pregnancy). Likewise, Lohman and Billings (2008) used a macro bio-ecological approach to examine similar environmental systems' impact on sexual debut and sexual behavior among adolescent boys aged 10 to 14 from data previously collected in the Welfare, Children, and Families: A Three-City Study. Their concepts also focused on family, school, and neighborhood and examined variables such as single-parent family structure, income, violence exposure, and parental education, and their findings suggested that certain factors are to be considered protective while others are deemed as negative. The use of a multipathway approach sought to encompass a

multitude of contributing factors and guides future researchers to recognize the complexity and certainty of confounding variables that should be included at the onset of examining the research question(s) rather than subsequent to them. Conclusively, Lohman and Billings found that delinquency, area of residence, family income, and negative peer influences are risk factors for early initiation of sexual behaviors (age 15 and younger).

Communication about sex and sexual behavior with peers and parents as an influential factor of adolescent sexual behavior has been examined in previous research using the theory of planned behavior or integrative model. The integrative model assumes that one's perceived control of behavior influences one's intentions to perform the behavior as well as actual engagement in the behavior itself (Busse et al., 2010). Busse et al. (2010) used the theory of planned behavior to demonstrate the effects of peer discussions about sex on intentions to have sex and sexual initiation. The researchers also examined parental influence on adolescent intentions to initiate sex. Parental interaction is believed to impact beliefs, values, and norms as well as self-efficacy and peer pressure. Parent-child communication was found to delay sexual initiation but not to delay intentions to have sex; however, peer communication was a significant, negative factor and demonstrated that discussions with prosex peers increased the potential to initiate sexual activity (Busse et al., 2010).

Sneed, Strachman, Nguyen, and Morisky (2009) also used the theory of planned behavior to examine parental communication and parental oversight influences on adolescent sexual behavior and sexual intentions. The researchers defined sexual

behavior on a continuum from lowest activity (e.g., kissing or less) to highest (e.g., touching, rubbing, oral sex, intercourse) and found inconsistencies with prior research; parental communication had minimal effects on adolescent intentions and sexual behavior. Conversely, Hutchinson, Jemmott, Jemmott, Braverman, and Fong (2003) used the theory of planned behavior and a social cognitive approach to assess the influence of maternal communication and sexual risk behavior among sexually experienced females aged 12 to 19. The findings in this study support the findings of previous research that demonstrated that higher levels of maternal communication positively influence sexual behaviors and sexual choices of adolescent females.

While it may seem that past research has largely focused on external social factors such as family and peer influences, Teitelman et al. (2009) used a social framework to examine sexual health and risk among adolescent girls in the United States by exploring the social context of sexual learning and the roles that social relationships play in female sexuality. The researchers' conceptualization of sexual health did not focus on a medically based approach to the phenomena but on a social level using one's perception of well being over the course of a lifetime. The adaptation of the World Health Organization's definition of sexual health was integrated in the study; the definition incorporates the ability to cognitively arrive at an understanding of behavior and risks associated with sexual behavior and to practice appropriate protective measures. One of the findings of this study was that adolescent girls were found to receive mixed messages about sexual health from health care providers, and these messages were even more conflicting with regard to culture. This finding confirms the need for culturally

appropriate messages in addition to the need for integration of social media, which plays a critical role in influencing attitudes and behaviors of today's youth.

Secondly, Rouner and Lindsey (2006) employed social cognitive theory integrated with a self-socialization approach to examine STD communication and knowledge among female adolescents. The integration of these theoretical approaches assumes that social interaction and environment, including cultural influences of sexual health decision-making, determine an adolescent's behavior. The findings of this research suggested that although older adolescents may possess higher levels of self-assurance and self-efficacy, they lack STD knowledge even if their knowledge is acquired through overconsumption of social media.

Lastly, Kan et al. (2010) used a social cognitive framework to examine the relationship between cognition, environment, and behavior and several precursors to sexual motivators, including family cohesiveness and maternal attitudes. These precursors were examined over time to assess their trajectory or course of impact from adolescence into adulthood and to determine their potential to influence number of sexual partners. This study supported the use of the social cognitive approach and its integration of an individual's thought processes in conjunction with societal influences and how they interact to impact decisions and behaviors. Kan et al. found that during adolescence, the number of sexual partners increased and then declined as the individual approached young adulthood. This finding reinforces the belief that children and adolescents lack the cognitive maturity to consistently make sound, positive decisions with regard to risk behavior and are more easily influenced by societal pressure and social interactions.

It is clear that social theories overlap with regards to conceptualization and variable choice, which has led to conflicting conclusions and assumptions with regard to sexual knowledge and behavior while lacking concrete resolution and improvement to the ongoing social dilemma faced by youth. In this research, I used an integrated approach of social cognitive and subjective culture theory to examine STD knowledge and further expand upon the differences that exist by gender and culture in order to provide suggestions for incorporating these differences in current interventions, media outlets, and curricula.

Gender Differences

Gender as an independent variable has been frequently explored in adolescent sexual health and behavioral research and has yielded mixed results. The assumption that several sociodemographic factors (female gender, age, ethnicity) increase the likelihood of engagement in high risk behavior has been robustly documented (Fetro, Coyle, & Pham, 2001; Kan et al., 2010; Murphy, Brecht, Herbeck, & Huang, 2009; Scott et al., 2011), more so than the impact of psychosocial factors. Considerably more research was found to examine sexual constructs among females (Senn & Carey, 2011; Zwane et al., 2004) than males and focused on risky sexual behaviors, age of sexual debut, perceived susceptibility to infection, and social influences rather than sexual knowledge and STDs. Although research exists on sexual knowledge and attitudes (Andersson-Ellstron & Milsom, 2002; Anwar et al., 2010; Clark, Jackson, & Allen-Taylor, 2002; Davis & Niebes-Davis, 2010; Jones & Haynes, 2006; Trajman et al., 2003), this information is limited among children.

For example, Fetro et al. (2001) administered the Youth Risk Behavioral Survey-Middle School (YRBS-M) to sixth through eighth graders attending 19 middle schools. The survey was developed by the CDC to assess health related behavior leading to death, disease, and social problems among early adolescents. The researchers found that more males engaged in sexual activity than females (17.3% vs. 9.2%, respectively). Several studies (Murphy et al., 2009; Scott et al., 2011) found that males tended to have more sexual partners than females, while the study conducted by Kan et al. (2010) found that males reported fewer sexual partners than females, demonstrating an inconsistency with other nationally reported data.

Prior research has also reported that females engage in sexual activity at younger ages than males as well as the opposite, that males have an earlier age of sexual debut (Senn & Carey, 2011; Zwane et al., 2004). The findings in support of males having more sexual partners than females could be highly correlated with an earlier sexual debut and exposure to more partners over longer periods of sexual activity. To further illustrate the contradicting research findings in the literature, Henrich et al. (2007) conducted a longitudinal study examining the impact of psychosocial factors on sexual behaviors among early adolescents in middle school. The researchers reported that male participants initiated sexual activity earlier than females and were more likely to engage in higher risk behavior. The results also found that over 11% of sixth graders and over 20% of eighth graders in the study were sexually active. Another study found that the average age of sexual debut for adolescent males was 12 years old (Lohman & Billings, 2008), and

Sneed (2009) concluded that a significantly larger percentage of males engaged in early sexual activity compared to females (16% vs. 6%, respectively).

In contrast, Senn and Carey (2011) found in their study examining the relationship between sexual debut with older partners and sexual risk behavior that the average age of sexual debut among females was 14.6 years of age. Zwane et al. (2004) discovered in their study exploring adolescent views of high risk sexual behavior that the youngest reported age of sexual debut was 9 years old; the average age of sexual debut among female participants was between the ages of 11 and 13 compared to 14 to 15 years old among males. In addition to the prevalence of STIs among female adolescents, STIs are occurring shortly after sexual debut and with very few partners (Forhan et al., 2009). Clearly past research studies have demonstrated that early sexual debut is reported frequently among young adolescents and identifies the need to integrate education, intervention, and prevention at earlier ages as well as the need to use social influences to help decrease sexual risk behavior and increase STD knowledge and knowledge of negative outcomes associated with the phenomena (Forhan et al, 2009; Lohman & Billings, 2008).

To further expand upon the need for increased STD knowledge, one longitudinal study conducted by Andersson-Ellström and Milsom (2002) described sexual knowledge and attitudes with regard to STDs reported by 79 women over a seven year period, from adolescence to young adulthood. The researchers found that STD knowledge scores were lower among 16-year-old females compared to 18 and 23-year-old females. The results also suggested that higher STD knowledge scores were associated with more sexual

partners and other potential risk factors such as a previous STD, higher rates of risky behaviors, alcohol use, and smoking. One finding that stood out was poor knowledge scores for asymptomatic infections among all ages in the study population. These infections included herpes simplex virus (HSV) and human papilloma virus (HPV), which are often carried and spread without presenting symptoms. The study's overall findings support prior research, which indicates that higher levels of knowledge are critical to practicing safe sex, but are not a guarantee that such protective behavior will be carried out during sexual activity in both adolescence and young adulthood (Jones & Haynes, 2006; Kershaw et al., 2005). Anwar, Sulaiman, Ahmadi, and Khan (2010) alternatively found that, among 1139 students aged 16 to 20 that were surveyed to gauge student awareness about STDs, those that reported sexual activity were less knowledgeable about STDs than those who had never engaged in sexual intercourse, and knowledge scores were slightly higher among females than males although this finding was not significant ($p = 0.458$).

The gender differences reported above clearly indicate that combatting early sexual debut is critical, not only by gender, but among the entire young population regardless of ethnicity or geographic location because STDs are a global issue. The fact that more research on STDs and high risk sexual behaviors exists for females highlights the need for gender focus, and at least deserves equal attention towards the needs and behaviors of young men given their role in the sexual explosion among youth. This statement in no way negates the important research on female sexual health, but emphasizes the need for gender sensitivity with regard to research, and education.

With regard to STD knowledge, more is known about HIV/AIDS among young populations compared to other infections (Anwar et al., 2010), which further confirms that improvements to current sexual education programs and prevention measures must focus on addressing asymptomatic infections as well as other STDs, increasing condom use, and introducing broader comprehensive education to children at younger ages. Males have been identified as having insufficient knowledge of STIs despite some findings that more men are carriers of STIs than women, yet women are more readily blamed for the spread of such infections and diseases (Makenzius, Gillander-Gadin, Tyden, Romild, & Larrson, 2009). Upchurch, Aneshensel, Mudgal, and Sucoff-McNeely (2004) also suggested that female susceptibility is increased due to biological makeup as well as greater age differences in their sexual partner networks. Busen et al. (2006) mentioned the prematurity of vaginal tissue in children and adolescence, which increases their vulnerability to disease by increasing rates of transmission and susceptibility. In their analysis of over 15,000 adolescent responses using data from the Add Study, Upchurch et al. (2001) found that males reported fewer incidences of STDs than females; however, there are ethnic differences that increase these risks substantially among males, due to higher exposure and environmental influences.

Ethnic and Racial Differences

Ethnic and racial differences within adolescent populations have been examined substantially in terms of sociocultural factors that potentially influence sexual risk behavior, attitudes, and levels of sexual knowledge. These sociocultural factors encompass, but are not limited to, the constructs of family socioeconomic status, social

environment, family systems, and parental educational attainment. The United States and many other developed countries consist of multi-cultural populations that experience daily interactions that can inevitably lead to assimilated influences on cultural norms, beliefs, and values. Additional research has also been conducted in less well-developed areas, and demonstrates that sociocultural factors impact the sexual health of adolescents on a global scale.

African American youth have been shown to engage in higher risk sexual behaviors more than their Caucasian counterparts. Much of the burden is believed to be attributed to the impact of neighborhood and social environment characteristics that leave minorities vulnerable to negative influences, lack of community cohesion, and scarce resources (Browning, Burrington, Leventhal & Brooks-Gunn, 2008). Browning et al. (2008) examined neighborhood inequality and the impact on sexual risk behavior among 11 to 16 year olds and found that African American youth had higher numbers of sexual partners than their European and Latino peers. It is these types of behaviors that leave this group susceptible to higher rates of STDs and teen pregnancies. Busen et al. (2006) assessed the differences between suburban and urban African-American middle school students' risky behaviors and found that urban students reported higher levels of risk taking behavior and results were significant for predictive influence of age, sexual activity, and drug abuse on risky sexual behavior ($p = 0.028$). This study supports the assumption that neighborhood differences can have significant implications for sexual risk by concentrating high risk partners in available networks, and the increased

likelihood of urban area exposure to poor social cohesiveness, and lack of community resources (Browning et al., 2008).

Similarly, Johnson-Silver & Bauman (2006) conducted a study among 14 to 17 year old African–American and Hispanic adolescents in the Bronx, NY to examine differences in HIV/AIDS knowledge, attitudes, and socio-demographics between those who were sexually experienced, and sexually non-experienced. Residents of the Bronx are typically poor minorities and this borough is one of the poorest in America, and experiences the highest rates of HIV/AIDS among youth in the city of New York. The results of the research support prior findings that males engage in higher rates of sexual activities; however, those that were sexually experienced were in the higher age range of the study population. Sexually experienced youth were also found to engage in higher risk behaviors such as drinking and smoking, and were poor academic performers. The sexually experienced group had higher levels of HIV/AIDS knowledge than the non-experienced group, which suggests that increased prevention and education measures need to be implemented for this extremely vulnerable group (Johnson, Silver, & Bauman, 2006).

To reiterate the influence of socio-economic and socio-demographic factors on incidence of STDs and behaviors, several other studies support the findings that ethnicity itself is a risk factor when conjoined with environmental factors. Newbern, Miller, Schoenbach, and Kaufman, (2004) found that in a study of African-American and Caucasian 7th to 12th graders examining socioeconomic status (SES) and STDs, African-American males and females of lower SES were more likely to have had an STD, and if

African-American youth were removed from their current lower income statuses to more affluent areas, they would more than likely shift to a lower STD risk partner network. These SES differences were less variable among Caucasian youth, especially Caucasian females; however, the explanation of this phenomena is not well understood, and is believed to be related to Caucasian female sexual partner networks and less about SES.

Incidentally, Caputo (2009) assessed the association between socio-demographic factors, abstinence/virginity, and sexual debut and ethnicity, and found that poverty was a significant predictor of early sexual debut among African-Americans versus their European counterparts. SES was found to be less of a predictor of risky sexual behavior based on ethnicity, and several other studies also indicate the insignificant predictability of SES on increased risk of sexual activity and negative outcomes (Newbern et al., 2004; Santelli, Lowry, Brener & Robin, 2000). Alternatively, Vukovic and Bjegovic (2007) found that increased family income and adolescent perception of family wealth negatively influenced sexual behavior and contraception use among 15-year-old children in Belgrade.

African-American adolescent females tend to be at the highest risk for STDs due to their high risk sexual partner networks of African-American males that have some of the highest STD rates across all racial groups. Halpern et al. (2004) examined risk factors by race and gender, and found that African-American females are among the lowest risk takers, yet they represent one of the highest groups with STDs. The assumption here is that African-American males of the highest risk taking group choose a partner network consisting of low risk taking African-American females, thus putting African-American

females at higher risk for contracting a sexually transmitted disease, including HIV/AIDS.

Although African-American adolescents are over-represented as a high risk group, other minorities experience high rates of STDs and sexual risk behaviors compared to their Caucasian and European peers. Hispanic and Latino youth are believed to have lower levels of STD knowledge than their Caucasian and African-American peers; however, Davis and Niebes-Davis (2010) found just the opposite to be true. In their study examining individual perception of future success and its relationship to sexual knowledge and attitudes, the research results indicated that Hispanic youth had higher levels of sexual knowledge than Caucasian and African-American youth, and Caucasian youth represented the lowest levels among the study population. Diagnoses of STDs among Hispanic youth represented the second highest rates behind African American youth and their pregnancy rates are the highest overall, among all racial groups (Davis & Niebes-Davis, 2010). Despite adolescent Hispanic females experiencing later sexual debut than their ethnically diverse peers, they are more likely not to use protection during sexual intercourse. This phenomenon may have more to do with level of sexual communication with partners, comfort levels, acculturation, and cultural norms rather than lack of knowledge (Deardorff, Tschann, Flores & Ozer, 2010).

Acculturation, or exposure of one ethnic group to the culture of a dominant group, is believed to contribute to the increased rates of STDs among Hispanic adolescents. In Hispanic families that maintain the norms of their native culture (male honor, female virtue, and caregiving, etc.), there is believed to be less acculturation to Westernized high

risk behaviors and lower risks of sexual debut and STDs (Upchurch et al., 2001). Research conducted by Upchurch et al. (2001) found that indeed those Hispanic youth that lived in majority Hispanic neighborhoods had lower degrees of acculturation, and adhered more to their native culture's norms and values. This is believed to be due to the levels of social support, cultural insulation from Western influence, and greater adolescent monitoring by parents and community networks. Conversely, the researchers found that in neighborhoods with less Hispanic residents and influences, adolescents were more likely to engage in sexual behavior.

The incidence of high STD rates and high risk sexual behavior is not limited to Hispanic youth living in North America. Clearly, a global epidemic exists, and has been demonstrated in several research studies to date. Gutierrez, Bertozzi, Conde-Glez, and Sanchez-Aleman (2006) presented evidence that high risk behaviors exist in Mexico due to poverty and found that among adolescents and young adults aged 15 to 21, economic factors play a role in influencing and worsening unhealthy behaviors. The researchers also found high rates of HSV-2 infections due to poor protective behaviors, especially among young females, due to their higher biological susceptibility and cultural factors that make females less likely to negotiate the use of condoms. Two additional studies conducted in Rio de Janeiro and Vitoria, Brazil examined STD knowledge and behavior among high school students and prevalence of Chlamydia among female adolescents, respectively (Espinosa-Miranda, Landmann-Szwarcwald, Lyrio-Peres, & Page-Shafer 2004; Trajman et al., 2003). Trajman et al. (2003) discovered that among the study population of 13 to 21 year olds, only 34% reported consistent condom use. Economic

factors were also found to negatively influence STD knowledge and condom use. The odds ratio (OR) of low family income to low STD knowledge was 9.4 and 11.6 for poor condom use. Espinosa-Miranda et al. (2004) found that rates of Chlamydial infection among 15 to 19 year old adolescents were significantly associated with multiple sexual partners and inconsistent condom use. These results were also consistent with research conducted in the United States. Ultimately, Hispanic and Latino youth clearly face some of the same social and economic challenges as African American youth, and may require more culturally representative educational tactics and preventive measures to reduce disease burden.

High risk sexual behavior and early sexual debut also exists among American Indian, African, and Asian/Pacific Island cultures as well, although not to the degree of African American, Hispanic, and Latino youth. For example, in a study conducted by Mitchell, Rumbaugh-Whitesell, Spicer, Beals, and Kaufman (2007) that examined the age of sexual debut among high STD risk American Indian adolescents and young adults, researchers concluded that males in this population were twice as likely to initiate sex earlier (by age 15) if they performed poorly academically compared to those males that had higher academic performance. Among females, those youth that dropped out of high school were twice as likely to have an earlier sexual debut compared to those females that remained in school. American Indian young adults also have some of the highest STD rates compared to Caucasians, which place them in a similar risk category of African American, Hispanic, and Latino youth with regard to gonorrhea and chlamydial infection. As with Hispanic and Latinos, acculturation of American Indian youth, especially within

reservations, exposes them to social pressures such as drug use and sexual activity despite their acknowledgement of traditional values that include monogamy and delayed sexual onset (Mitchell et al., 2007).

Similarly, in a study conducted by Ademayo and Williams (2009) in Nigeria among 13 to 18 year olds, the researchers examined factors that influenced risky sexual behavior and found that the risk factors mimicked one another among adolescents on a global scale. Some of the factors determined to influence risky sexual activity among this African population were peers, parental relationships, and social media, which are some of the same factors found in past research to influence American youth.

Acculturation among Asian and Pacific Islanders, especially native Hawaiians, have led this group of youth to also experience an earlier sexual debut (age 13), and high risk behaviors compared to their Caucasian counterparts. This was found to be due to lower economic status, lack of protective behavior, and partnering risk behaviors (smoking and alcohol use; Sasaki & Kameoka, 2009). Again, this research further supports the global crisis faced by many nations and cultures that share the burden of STDs among their future adults, and stresses the urgency to address the problem potentially on a global scale.

Parent, Peer, and Media Influences

Sexual knowledge and behavior influences are not limited to demographic, environmental, cultural, and economic factors. Additional factors that may contribute to increased risk and lack of knowledge include, but are not limited to, parental and peer communication, and social media. These factors have been researched significantly and

the results have shown that these factors both positively and negatively impacted levels of knowledge, sexual initiation, and behaviors. Parents play an important role in sexual education but can be hesitant to discuss sexual information with their children due to fear of inadequate information, topic sensitivity, and fear that the discussion may lead their child to experiment sexually (Sprecher, Harris & Meyers, 2008). To further elaborate on the study conducted by Hutchinson et al. (2003) mentioned earlier in this literature review (see Theoretical Frameworks), the researchers examined mother-daughter relationships and communication about sex and risk behavior. The study population included adolescents and young adults age 12 to 19, located in an inner city of the United States. The researcher's conclusion supported prior findings that higher levels of communication between mothers and daughters about sex and protective behavior reduced not only sexual activity, but also unprotected sexual activity. There was no significant relationship found between level of communication and number of sexual partners, but the evidence in this research does further support the need for parental involvement and collaboration with regard to sexual education and high risk behavior.

Increased parental monitoring of adolescent activity and peer groups may require integration into current interventions and educational platforms to positively influence and reduce the number of sexual partners, and ultimately reduce the risk of infection (Hutchinson et al., 2003). Sneed, Strachman, Nguyen, and Morisky (2009) demonstrated the significance of parental monitoring in a study examining its influence as well as communication on sexual behavior and intentions among 11 to 16 year olds in Southern California. The researchers found that higher levels of parental monitoring among males

significantly reduced the likelihood of certain sexual behaviors such as kissing, foreplay, oral sex, sexual intercourse, and anal sex. Parental monitoring had no significant effect on female behaviors with the exception of French kissing, but did have significant effects on female intentions. Females were less likely to plan to have foreplay or have sex. Parental communication had no significant effect on any adolescent male behavior and only influenced French kissing among adolescent females.

Sneed (2008) also examined adolescent and parent (both mother and father) comfort level with regard to sexual discussions and found that adolescents categorized as low risk (holding hands, kissing), did not report sexual communication with their parents. This finding seems to support prior research stating that adolescents that talk to their parents about sex are more likely to be sexually active. However, the case may be that teens that are already sexually active seek information more regularly from their parents about sexual behaviors, given the fact that parental messages are usually in the form of warnings and protective behaviors. In this research, Sneed also reported that parental communication reduces the risk of an adolescent's transition from a lower risk group to a higher risk group. Consistently, research has found that adolescents prefer their parents as their main source of sexual education and information, rather than peer influences and social media, despite the fact that access to sexual information has increased via television and the Internet. It is clear that collaboration with parents is critical to increasing awareness and reducing high risk behavior, and this must be considered in an effort to reduce incidence rates of STDs among this population.

Conversely, Sprecher et al. (2008) found that among college students, peers represented the major source of sexual information, including sexual partners, with parents and teachers providing minimal influence. Sources of information did differ ethnically, with African-Americans reporting receipt of sexual information primarily from parents compared to their Caucasian and Hispanic counterparts. Despite this finding, African-American youth continue to represent the largest group infected with STDs, which further supports the need for ethnically directed education and prevention programs. Social media can lead to inaccurate sources of information, but also serves as a potentially helpful resource by way of public health messages, instructions for correct condom use and accessibility, and STD prevention and educational information (Sprecher et al., 2008).

Clark, Jackson, and Allen-Taylor (2002) conducted a study among 393 adolescents in an urban area of Philadelphia to assess the frequencies of STD information from various sources and level of STD knowledge, and found that of the 97% of the study population that reported STD education, their major sources of information were school, parents, and peers (70%, 52%, and 31% respectively). In addition, the researchers found that participants had low STD knowledge scores based on the Sexuality Information and Education Council of the United States (SIECUS) guidelines, especially regarding curability of STDs. According to SIECUS, educational content includes four levels: Level 1 (children aged 5 to 8 should learn what types of organisms cause STDs and HIV), Level 2 (age 9 to 12 should know Level 1 information and learn the types of STDs), Level 3 (age 12 to 15 should learn more detail about transmission of STDs, signs

and symptoms, and treatment if available), and Level 4 (age 15 to 18, should have a complete understanding of STDs and HIV and be able to correctly identify and communicate STD information). This study demonstrated that adolescents had acceptable levels of knowledge about HIV, with the exception that they reported HIV as the most common STD; however, they lacked sufficient knowledge about more common infections such as Chlamydia, which they are more likely to be exposed to (Clark et al., 2002).

In a study conducted by Testa and Coleman (2007) in the United Kingdom that examined preferences of sexual information among over 3000 minority students age 15 to 18, the researchers found that some of the least desired sources of sexual information were the Internet, television, radio, and magazines. Differing by gender, more females preferred magazines, and more males preferred the Internet. This research was consistent with other research findings, demonstrating that many adolescents prefer their parents and school as their primary source of sexual information. To further support the role of parents in educating their teens, Somers and Surmann (2004) also found that among 672 adolescents (age 15 to 18) in the Mid-western United States, the primary preference for delivery of sexual information were parents, followed by school, and lastly by peers. All three sources must be able to communicate accurate information and exhibit a collaborative effort to ensure that other sources of less credible information are not sought. Peers must be recognized as a highly influential source of information, reiterating the need that they be properly educated and included in preventive measures.

Impact of Sexual Education on STD Knowledge and Behavior

Sexuality education is defined by SEICUS as a lifelong process of acquiring information and forming attitudes, beliefs and values about identity, relationships and intimacy. It encompasses sexual development, reproductive health, interpersonal relationships, affection, body image, and gender roles. Sexuality education addresses biological, socio-cultural, psychological and spiritual dimensions of sexuality from a cognitive, affective (emotional), and behavioral domain including skills to communicate effectively and make responsible decisions. (National Guidelines Taskforce, 1991)

This definition means sexuality education is comprehensive, and includes a gamut of social science perspectives and learning material, that is supposed to help our youth develop to become responsible adults that can process learned information in order to make conscious, positive decisions. The argument has been made over and over that sexual education promotes high risk sexual behavior and has been the rationale for abstinence-only educational approaches, coupled with cultural aspects as the proper way to instruct our youth about sex. This approach has also become highly politicized and no longer addresses the real issue – increased rates of STDs and pregnancy (Braeken & Cardinal, 2008).

Prior research has supported the fact that abstinence-only sexual education fails to reduce the age of sexual debut and has even less of a positive effect on high risk sexual behavior. Kirby (2008) reviewed 56 studies that evaluated the impact of abstinence-only versus comprehensive sexual education programs on sexual behavior and found evidence supporting the lack of positive influence on high risk behavior among abstinence-only

education. Conversely, Kirby found that almost two-thirds of comprehensive programs positively affected sexual debut and the use of protection, both condoms and contraception. School plays a major role in affecting the lives of youth given that school is the one place in our society that is most attended. Nearly all of our youth aged 5 to 17 are enrolled in school and attend school before they initiate sexual behavior as well as during the time they initiate sexual behavior. Research supports the fact that when a young individual drops out of school, they are more likely to initiate sex and participate in high risk behavior, or become pregnant. Some of this risk is also associated with the environmental and socio-demographic differences between youth who remain in school and those who drop out which cannot be ignored. Despite these differences, it cannot be ignored that dropping out of school continues to impact sexual behavior negatively (Kirby, 2002).

The question remains whether sexual education matters, and whether it has an impact on STDs. Again, research supports the ineffectiveness of abstinence-only education on decreasing sexual behavior, but there is a gap in the literature regarding the age at which sexual education should be implemented, and what level of education it should entail. Ott and Pfeiffer (2009) believed that sexual education should include age appropriate models that are culturally sensitive. At the same time, the researchers believe that the level of a youth's own understanding of the meaning of abstinence and the premise of no sex until marriage lead to its ineffectiveness. They conducted a study among 11 to 14 year olds to assess their view of abstinence and found that among this group of participants, effective programs must examine an individual's sense of how they

view sex. Some participants viewed sex as "nasty" and embraced abstinence, while others were curious, and in a transition between sex as a rite of passage to adulthood, were undecided if they were ready or not to engage. The last group identified themselves as "normative" and assessed their own level of readiness and the readiness of others as well as the influence of adult responsibility required by engaging in sexual behavior. The researchers argued that sexual education programs would require an approach that especially serves those adolescents that see themselves as "curious" or "ready" (Ott & Pfeiffer, 2009).

DeRosa et al. (2010) examined the prevalence and correlation of sexual behavior among adolescents as a guide for interventions with regard to intercourse and oral sex, and believe that such interventions should be implemented before sixth grade and continue throughout middle school. The researchers also stressed the importance of targeting high risk groups such as African American males and teens who know someone that has become pregnant. The researchers administered a survey to sixth, seventh, and eighth graders attending one of 14 middle schools in Los Angeles, California. The survey consisted of demographic, sexual behavior, and risk and protective factor questions adapted from existing questionnaires, including the Youth Risk Behavior Surveillance System (YRBS), facilitated by the CDC. DeRosa et al. found that the difference between youth in eighth grade versus younger grades was significant with regard to sexual behavior, especially among African-American males, who reported higher rates of sexual intercourse. The researchers concluded that interventions that target elementary school students are necessary with a focus on interpersonal relationships and expand to sexual

activity throughout middle school. These formative years are highly influenced by peer relationships and should include educational information of sexuality and negotiation of protective measures to help reduce the prevalence and incidence of STDs and pregnancy (DeRosa et al., 2010). In support of this argument, Downs, Bruine de Bruin, Murray, and Fischhoff, (2006) examined 300 sexually active females aged 14 to 18, with the majority (75%) of them African American, with regard to STD knowledge after administration of an interactive STD DVD and questionnaire. Downs et al. found that despite the intervention, the participants learned about STDs other than HIV/AIDS only after being diagnosed with an STD. The researchers concluded that adolescents need an introduction to STD information earlier, and not only an intervention that focuses on HIV/AIDS, but on the more prevalent STDs such as Chlamydia, gonorrhea, and herpes.

In addition, Tortolero et al. (2010) examined the effects of a theory-based intervention called "It's Your Game: Keep it Real" (IYG) on delaying sexual behavior among minority middle school students in Southeast Texas. IYG consisted of 24 grade appropriate lessons administered by trained facilitators that utilize classroom-based activity coupled with journaling and individual computer based lessons. Some of the topics included healthy friendships, setting limits, refusing negative behaviors, and STDs/STD testing. Parents were also involved in the program through the use of parent child homework assignments that promoted dialogue and communication. The researchers demonstrated that sexuality and STD-prevention based interventions can delay the onset of sexual intercourse and specifically impact the onset of anal and oral sex behavior, especially among females. IYG also reduced the number of sexually active

students having sexual intercourse three months after the introduction of the intervention. The researchers also believed that middle school programs do not adequately address oral and anal sex and must implement these factors into sexual education programs, given the increasing tendency of teens and young adults to engage in such behaviors. Some students who have already initiated sexual behavior prior to the seventh grade may require more intense intervention as they are considered a high risk group, at higher risk of developing STDs and becoming pregnant (Tortolero et al., 2010).

One study in Washington, D.C. that evaluated an intervention intended to delay sexual debut among fifth graders considered high risk found that interventions must seek to be culturally and environmentally sensitive given the population's circumstances. High risk youth are not only battling peer influences, but they also have the additional economic and environmental obstacles that often outweigh positive influences, and have a greater impact on poor choices. For example, nationally, almost five percent of adolescents younger than age 12 have initiated sex, whereas in Washington, D.C., over 11% initiated sex prior to age 13 (Koo et al., 2011).

Despite the above-mentioned findings, additional research has indicated that although adolescents have received STI education, their knowledge still remains low with regard to current prevalent infections, and different approaches are required to improve such knowledge including earlier implementation of knowledge coupled with other risk prevention programs (Kurkowski et al., 2012). In support of Kurkowski et al., Agius, Pitts, Smith, & Mitchell (2010) conducted a study of secondary school students in Australia and found that HIV knowledge is high and STI knowledge does increase with

age; however, younger adolescents were having the same level of sexual partnering as their older counterparts. The researchers also supported previous findings that conclude that higher knowledge levels do not necessarily cease high risk behavior, but it does improve an adolescent's ability to make informed, positive decisions regarding their health and sexual behavior.

With regard to research among females and the impact of education on sexual behavior, Annang, Walsemann, Maitra, and Kerr (2010) found that education inversely affected the acquisition of STDs among females, with the exception that the relationship was stronger for Caucasian females compared to African-American females. The researchers found that African-American female college students reported higher incidence of STDs than their Caucasian female counterparts, and that the impact of education and reduced sexual risk behavior strongly varies by ethnicity. On the other hand, the researchers also concluded that education had a positive influence on sexual debut, partnering with an IV drug user, prostitution, and condom use between both African-American and Caucasian females. This research supports the positive influence of education on sexual behaviors; however, supports the need for culturally appropriate curricula with regard to interventions and the need for more research into the underlying causes of ethnic differences in high risk behavior (Annang et al., 2010).

Previous Research Methods That Influenced This Study

The methods proposed for this study were influenced by several studies conducted in the United States, the United Kingdom, and Brazil. One study was conducted in a Philadelphia children's hospital using a convenience sample from 393

patients age 12 to 21 in a waiting room, between April 1996 and February 1998. Sex education counselors used a quick verbal STD knowledge assessment to assess the participants STD knowledge level according to SIECUS guidelines (Clark, Jackson, & Taylor, 2001). The data was analyzed using STATA 6 and SPSS for Windows. Chi-square tests were used to compare STD knowledge scores between age and ethnic groups. Additional data analysis comparing knowledge scores used ANOVA and t-tests and relationships between STD score and age used correlation and logistic regression. STD knowledge scores were calculated numerically by computing the number of correct answers minus the number of incorrect answers for both curable and incurable STDs separately.

A study conducted among 668 middle school students in metropolitan New York City used self-administered questionnaires to assess sexual activity, intentions to engage in sex, and expectations about sexual activity based on an integrated theoretical framework (Guilamo-Ramos et al., 2008). The researchers initially conducted a pilot study among a small sample of representative students using open-ended interviews to gather constructs for the self-administered questionnaire used among the larger study sample. The final test instrument consisted of approximately 30 items measuring behavioral intention, expectancies, social norms, self-efficacy, affect and emotion, and sexual behavior. Self-esteem was measured using a five-item scale based on the Rosenberg scale. Data was analyzed using correlations to assess the relationships between the independent variables and sexual behavior, and multiple regression to

determine the effects of the predictor variables on latent behavioral intentions; however, the statistical software used could not be determined.

A study conducted in the United Kingdom administered two true-false questionnaires and utilized focus groups to assess STD knowledge and sexual behavior among college students from an individual institution (Jones & Haynes, 2006). The first questionnaire was administered to college students age 16 to 24 and provided 303 responses. Eight focus groups were conducted among some participants that had completed the first survey as well as among new participants from classrooms where the first survey was administered. A second questionnaire was administered to students attending a different university and was distributed through the mail. These participants were between the ages 18 to 21 and a total of 289 responses were received out of approximately 2065 questionnaires distributed. The data from the questionnaires were analyzed using SPSS and Pearson's chi-square test to compare correct and incorrect/don't know responses between the two groups. The focus groups were centered on additional STD risks and negative outcomes, and sought to examine the level of STD knowledge in greater detail with more personalization from the participants.

Lastly, in a cross-sectional study of 945 Brazilian high school students between the ages of 13 to 21 attending ten public and private schools in Rio de Janeiro, the researchers used a questionnaire to assess STD/AIDS knowledge and sexual behavior (Trajman et al., 2003). Students were eligible to participate if they were present on the day of school that the survey was being conducted, and they signed informed consent. The questionnaire was scored based on the median score of a subset of correctly

answered questions. A score was generated for each student and that score was determined to be “satisfactory” or “unsatisfactory” with regard to his or her level of knowledge. The data was analyzed to determine the association between demographic variables and unsatisfactory knowledge score.

A ten-question subset of the STD-KQ has been used previously to assess STI knowledge among African American adolescents age 13 and older (Swenson et al., 2009) as well as a six-item subset of questions among adult STD clinic patients (Scott-Sheldon, Carey, Vanable, Senn, Coury-Doniger, & Urban, 2010). The full 27-item questionnaire was also administered to a population of men having sex with men in Massachusetts (Mimiaga et al., 2009).

Similarly, this research study utilized some aspects of each of the aforementioned studies. For example, this study employed a quantitative approach via a self-administered questionnaire and the STD-KQ was administered; however, the entire 27-item questionnaire was utilized versus only a subset of questions, which was previously used in prior research among adolescents. Participants were recruited from public schools through purposive sampling, however; only seventh grade students were assessed and their level of STD knowledge measured using the questionnaire.

Summary

Despite the vast amounts of research available examining the impact of sociodemographic, environmental, and cultural factors that influence STD knowledge and sexual behavior among adolescents, prior research is limited with regard to children in elementary school and early middle school. This research targeted a younger

population to further support the need for assessments of STD knowledge at younger ages, given the rapidly increasing rates of curable and incurable STDs, and provides evidence that increased knowledge and instruction is required to successfully address this phenomena. This literature review has demonstrated that gender and ethnic differences in STD knowledge and risk behavior are paramount, and that implementation of a sexual education curricula does play a positive role in providing a foundation for adolescents with regard to knowledge and foreseeable risks.

Although numerous theoretical frameworks were illustrated in this literature review, no specific social theory exists that can solely reduce the burden of disease. However, it is critical to use multiple theories as well as community resources (parents, health care providers, teachers, etc.) in a collaborative effort to resolve this persistent social phenomenon. Social cognitive theory and subjective cultural theory were used to examine STD knowledge levels among 12 to 13 year olds. Chapter 3 discusses the research methods that were used in this study and outline the data collection and analysis plans.

Chapter 3: Research Method

Introduction

The purpose of this study was to investigate the level of STD knowledge among seventh grade students and determine if gender, age, and ethnic differences in STD knowledge exist among this population. Prior research has demonstrated that the age of first intercourse is getting younger among both boys and girls. However, there is a lack of existing research that has examined STD knowledge and sexual behaviors among young children. Sexual education curricula primarily focus on HIV/AIDS and do little to enlighten preteens on other STDs, despite the growing rates of infection among youth on a global scale. In this research, I attempted to measure STD knowledge using the STD-KQ. An integrated theoretical approach consisting of social cognitive and subcultural theory is the foundation of the research questions analyzed here. This chapter will provide details of the research with regard to the study design and setting, study rationale, and methodology.

Research Design and Rationale

A cross-sectional study design was used to assess STD knowledge based on social cognitive and subcultural theory. A cross-sectional design is the most appropriate for this research because the focus is an assessment of level of STD knowledge at a given point in time. Due to the absence of an intervention or an administered educational based tool to examine pre- and post-test scores, this design was feasible to assess real time knowledge of STDs based on current and previous exposure to information at home, socially, and in an academic setting. In addition, this design reduced the amount of time

away from the classroom setting compared to alternative designs (i.e., longitudinal) that require repetitive interaction over time (Trochim & Donnelly, 2008, p.6). The primary goal of this research was to collect the data with as little disruption to the participants as possible by allowing participants to complete the survey using a traditional mail-in method for those students who may not have a computer in the home, and an electronic version via the Internet for those who have access to a computer. The use of a survey design was the most appropriate option based on prior research examining STD knowledge among adolescents and young adults (Jones & Haynes, 2006). The following research questions were quantitatively addressed:

Research Question 1: Is the STD-KQ a valid and reliable measurement tool of STD knowledge among seventh graders?

Research Question 2: Are there differences in STD knowledge scores among seventh graders with regard to gender, age, and ethnicity?

$H_0$2: Differences do not exist in STD knowledge scores based on gender, age, and ethnicity.

H_a2: STD knowledge scores will be higher among females than among males; STD knowledge scores will be higher among 13 year olds; STD knowledge scores will be higher among minority (African-American/Hispanic) students versus non-minority students (non-African-American/non-Hispanic).

Research Question 3: Do gender, age, and ethnicity predict STD knowledge among seventh graders?

$H_0$3: Gender, age, and ethnicity do not predict STD knowledge scores among seventh graders.

H_a3: Gender, age and ethnicity predict STD knowledge scores among seventh graders.

In this particular research study, the participant's responses to the questionnaire provided support to confirm or reject prior hypotheses that additional STD education is warranted among younger age groups.

Face Validity

Five seventh grade students were recruited by a board member of the Parent/Teacher Organization (PTO) in Piscataway, New Jersey, to complete the STD-KQ prior to the survey being administered to the study population for purposes of evaluating face validity. This location was chosen for recruitment because it is my location of residence, and the PTO board member has a child who was in seventh grade at the time of the study. The STD-KQ has primarily been administered to adults age 18 and over and has not been administered in its entirety to this population. In an effort to establish if the survey appears to measure what is intended among seventh graders, the five students completed the survey and answered four open-ended questions with regard to their overall impression of the survey. The four questions were as follows:

- Was this a good survey?
- Did you understand the questions?
- Do you think it measured what you know about sexually transmitted diseases?

- For the questions that you circled DK for Don't Know, do you truly not know the answers or were the questions confusing?

The students' survey data collected for measuring face validity was not entered into SPSS or analyzed based on the described hypotheses for the study.

Content Validity

Eight subject matter experts (SMEs) were recruited to review the STD-KQ for purposes of measuring content validity and ensure that the survey content and composition is in line with the questions being used and what the survey is supposed to measure, which is STD knowledge. For the intent of this study, SMEs were defined as having experience working with a similarly aged population, working within the area of health or health education, or having an advanced degree in health sciences or a related field. Content validity was measured using the content validity ratio, or CVR, by Lawshe (1975), and consists of recruiting a panel of subject matter experts to rate each question as essential, useful, but not essential, or not necessary to the performance of what is being measured (i.e., the construct). Lawshe's CVR has been widely used in a variety of disciplines including healthcare and education (Ayre & Scally, 2014). The CVR formula is illustrated below:

$$CVR = \frac{n_e - N/2}{N/2}$$

Where: n_e equals the number of SMEs rating an item as "essential" and N equals the total number of SMEs providing ratings.

Figure 1. Content validity ratio formula.

Population and Sample

The sample population used in the main study was 207 seventh grade students, ages 12 and 13, attending public middle school in the United States. The participants were recruited from middle schools in Charlotte and Chapel Hill, North Carolina, from public libraries in New Jersey, and via Survey Monkey Audience. The middle school setting was ideal because of the accessibility of the target population and it represents a location where almost all of the target population congregates. Recruitment at community locations such as public libraries were selected because these are family oriented locations with ties to learning both academically and creatively, and serve as locations where families with seventh grade students congregate and participate in community activities. In addition, the potential impact and influence that this type of research can have on improving and expanding sexual education curricula to address increasing disease rates is an important factor. Survey Monkey was also used as a recruitment tool, given the limited responses received directly from middle school students and from posting flyers in community locations. Survey Monkey has access to over 30 million diverse participants who routinely complete surveys for various organizations and charities. and make up a representation of the United States population. Using this type of recruitment method in addition to middle schools and community location recruitment

yielded more participants than expected and required for this type of research. Of the 207 participants, 199 were recruited from all over the United States via Survey Monkey Audience; five were from middle schools in Charlotte, North Carolina, and three were from flyers posted in New Jersey libraries.

The target sample population was estimated using G*Power and the chi-square goodness of fit test (Faul, Erdfelder, Lang, & Buchner, 2007). The effect size is estimated to be medium ($w = .30$), with 80% power, 2 degrees of freedom ($Df = 2$) and α error probability of .05. The sample size was estimated at 108 students for administration of the STD-KQ questionnaire.

Twenty-seven middle schools in Charlotte, North Carolina and four middle schools in Chapel Hill/Carrboro, North Carolina were contacted for participation. Out of the 43 total middle schools in Charlotte, North Carolina, the 27 chosen to request participation was determined by the actual name of the school (if it included the word "academy," "elementary," or "arts" in the formal name or email address, it was not contacted). All four middle schools in Chapel Hill/Carrboro, North Carolina were contacted.

Instrumentation

The survey instrument used in this research is the STD-KQ (Appendix A), which is a brief comprehensive measure of STD knowledge developed by Jaworski and Carey (2007). The questionnaire consists of 27 items that seek to assess knowledge of STDs other than HIV/AIDS. The developers chose to focus on STDs other than HIV/AIDS because they felt that the knowledge of HIV/AIDS has increased; however, knowledge of

the larger groups of STDs remains at low levels due to the educational focus of HIV/AIDS compared to other diseases. Despite the similarities of transmission among all STDs, there are significant differences that will need more attention in order to deter and prevent transmission and increased incidence of disease (Jaworski & Carey, 2007).

The STD-KQ was developed using a review of past literature on STD knowledge questionnaires and the most current information on STDs as a tool for item development. STD information was gathered from the CDC, and a focus group consisting of six STD experts (nurse practitioners and medical doctors) and 40 participants, was used to add and modify item content with regard to reducing risk and to contribute to the foundation of construct validity (Jaworski & Carey, 2007). The initial questionnaire consisted of 85 items and was piloted to a small sample group (n = 50) of college students. A revised questionnaire based on the results of the small pilot group consisted of 76 items and was administered to a larger sample (n = 391) of college students. The small pilot sample focus was question difficulty and item variation, while the larger pilot sample focus was internal consistency, item analysis, and factor analysis. The small pilot sample participant ages ranged from 18 to 49, and the large sample ages ranged from 18 to 74. Both samples were majority female (over 80%) and of similar ethnic diversity (Hispanic, White, African-American, Asian/Pacific Islander, Multiracial, and other). The final 27-item questionnaire (Appendix A) has internal consistency of α = .86. A final study group consisting of 80 participants (majority female with mean age of 26 and age range of 18 to 74) divided into a test and control group, demonstrated test-retest reliability of r = .88 over a short period of time, using a 30-minute educational STD video for the test group

and readministering the questionnaire to both groups (Jaworski & Carey, 2007). In this research, I sought to validate the STD-KQ among 12 to 13 year olds by comparing average gender STD knowledge scores to those of the research study conducted by Swenson et al. (2009) in which female and male adolescents (age 13 to 18) scored 44% of questions correct versus 36% with standard deviations of +/- 2.03 and 2.08, respectively. Other research employing the STD-KQ assessed STD knowledge among older populations (18 years and older) and scores were significantly higher (mean STD knowledge score = 16.8, or 62%) as prior research has indicated (Mimiaga et al., 2009). Internal consistency reliability was measured using Crohnbach's alpha.

As demonstrated in Appendix A, all items are written as short statements in present tense, using grammar that is easy to understand. Each item has only one correct answer, and there are greater "false" statements because, in the developer's opinion, they are easier to distinguish or make a decision on an answer. The option of "don't know" is available and more items are relative to females due to the increased variation of outcomes as a result of contracting an STD (Jaworski & Carey, 2007). Demographic questions were included (gender, age, ethnicity) in the beginning of the questionnaire to ensure that this information is captured about each participant for additional analysis. The optimal score for the STD-KQ is 27 points. Each correctly answered item was 1 point, incorrect answers were scored 0, and answers of "don't know" were scored as incorrect and received a zero score.

Data Collection

Data were collected between June 11, 2014 and November 21, 2014 from participants attending one of three middle schools in Charlotte, North Carolina, and from participants who contacted me via study flyer (Appendix G) posted in public libraries throughout New Jersey. Survey Monkey Audience also recruited participants during this timeframe by sending email notifications to their active pool of members who were parents of seventh graders. Survey Monkey Audience participants were from all over the United States. No participants were from the middle schools in Chapel Hill, North Carolina. Only students in seventh grade were eligible for participation in the face validity portion and in the main study, regardless of their gender, ethnicity, or if they have repeated a grade year, as long as they were 12 or 13 years old.

For participants recruited directly from the three middle schools in Charlotte, North Carolina, seventh grade teachers provided the study information leaflets (Appendix D) and self-addressed stamped envelopes to all seventh grade students. Each student took the leaflet home for their parents to review, and if the students and their parents were interested in participating, they completed the section of the leaflet confirming interest, providing their mailing address, and indicating if they had access to a computer. Once I received the completed information leaflet, the parent informed consent and child assent were mailed along with another self-addressed stamped envelope. The informed consents explained the research purpose and design, including topic sensitivity, confidentiality, and voluntary participation as well as risk and benefits to participants. Researcher contact information was provided for any additional questions or concerns parents may have had

about their child's potential participation prior to or after the start of the study. Once I received the signed informed consents, a letter was sent to the potential participant with a link to the electronic version of the STD-KQ.

Recruitment also included flyers posted at local YMCAs, Boys and Girls Clubs, and public libraries located in New Jersey (where I reside). Flyers were also posted at these community locations in Charlotte and Chapel Hill/Carrboro, North Carolina; however, no participants were recruited from these locations. The flyer included a brief description of the research and researcher contact information. Parents contacted me if they were interested in letting their seventh grader participate. I obtained the parent/child's email address to send the leaflet and the informed consent/assent. Once the signed informed consent/assent was received, I signed the consents and sent them back via email along with a link to the Internet survey and instructions to contact me once the Internet survey had been completed.

Survey Monkey accessed their database of potential participants to determine which members were parents of seventh grade students in the United States. Participants that fit the criteria were contacted via an email invitation regarding this research study and asked if they agreed to let their child participate. Parents that were interested and agreed were sent a link to the Internet version of the survey. Parental consent and child assent were required electronically using consent statements at the beginning of the online survey.

The STD-KQ questionnaire took approximately 20-30 minutes for participants to complete. Participants recruited via flyers and middle schools were mailed a $10 Visa

Gift Card once the completed questionnaire was indicated as complete on the Survey Monkey website, and they notified the researcher that the survey was completed. Participants recruited through flyers and/or middle school that happened to skip questions also received their $10 Visa Gift Card. A copy of the completed questionnaire with the correct responses and explanations of the correct responses were sent to the parent and participant for review and clarification to prevent dissemination of incorrect information regarding STDs, once data collection and analysis was complete. Survey Monkey participants were anonymous and did not receive a $10 Visa Gift Card per Survey Monkey's Incentive policy, which prohibits direct incentives to be provided by researchers. Survey Monkey Audience is directly responsible for any incentives provided to their survey audience.

Data Analysis Plan

The data was exported from Survey Monkey and analyzed using SPSS. Demographic information was collected as well and frequency tables were created. Chi-square tests were used to determine if relationships exist between age, gender, and ethnicity and STD-KQ knowledge scores. Multiple linear regression was used to determine the predictability of gender, age, and ethnicity on STD knowledge scores. Chi-square tests examine relationships between categorical variables (Rumsey, 2009, p.25). Multiple linear regression analysis is used to estimate the dependent variable based on multiple independent variables (Rumsey, 2009, p.83). In this research study, the independent variables are age, gender, and ethnicity and the dependent variable is STD-

KQ score. Table 1 summarizes the research questions, variables, and type of analysis to be used in the study.

Table 1

Summary of Research Questions, Variables, and Planned Analysis

Research question	Variable	Scale	Analysis
Is the STD-KQ a valid and reliable measure of STD knowledge among seventh graders?			Face validity using five seventh grade students review of the questionnaire; content validity using eight subject matter experts which include three PhDs (committee chair, committee member, PhD in Psychology) and five teachers who have worked with seventh grade students; comparison of mean gender STD scores; Crohnbach's alpha for assessing internal consistency reliability using all participant's answers to grouped STD-KQ questions.

(table continues)

Research Question	Variable	Scale	Analysis
Are there differences in STD knowledge scores among seventh graders with regard to gender, age, and ethnicity?	Dependent: STD-KQ knowledge scores	Categorical	Chi-square
	Independent: Gender, Age, Ethnicity	Categorical	
Does gender, age, and ethnicity predict STD knowledge scores among seventh graders?	Dependent: STD-KQ knowledge scores	Continuous	Multiple linear regression
	Independent: Gender, Age, Ethnicity	Categorical	

Ethical Considerations

Parental informed consents and child assents were utilized in this study for all study participants. An information leaflet explaining the study was given to seventh grade students at each participating Charlotte middle school.

One major ethical concern is the sensitivity of the research topic. The sensitivity factor was managed by ensuring that confidentiality was maintained. All surveys were anonymously collected via Survey Monkey and informed consents and participant information was kept in the possession of the researcher. Participant IP addresses were captured by Survey Monkey to ensure that no surveys were completed multiple times by the same participant; however, Survey Monkey does not use this information in any capacity outside of this study and all study data belongs to the researcher only.

The sensitivity of the topic and the age of participants may have had an impact on the response rates as shown in prior research studies as parents and educators are hesitant to expose early adolescents to sexual material (Markham, Fleschler-Peskin, Addy,

Baumler, & Tortolero, 2009). For the purposes of this study, 1225 study leaflets were distributed directly to seventh graders, and approximately 100 flyers were disseminated throughout community locations in New Jersey and Charlotte/Chapel Hill/Carrboro, North Carolina. In addition, Survey Monkey Audience contacted 805 parents of seventh graders from all over the United States, for potential participation in the study.

Participants have a right to be respected with regard to their level of comfort, both physical and psychological risks, willingness to participate, and their confidentiality when participating in any type of research (Creswell, 2009, p.89). This study aimed to maintain the participants level of comfort by assuring them that at any point they no longer feel comfortable with the study design or questions, they have the ability to withdraw with no consequences. STDs are a sensitive topic regardless of the age of the population and given the vulnerability of this study population, the purpose of the study was explained in detail to both parents and participants via the paper and electronic informed consent forms. This study population is young and can often be easily distracted. Despite the sensitivity of the topic, participants were not asked to reveal any personal sexual behaviors that may cause embarrassment or shame.

The risks associated with asking potentially embarrassing questions was explained and the participants were informed that at any time, he or she could decline to answer a question without judgment or retaliation. There were no foreseeable risks to study participants as a result of this research; however, participants may have felt uncomfortable due to the sensitivity of the research topic. The benefit to study

participants and other young people is the potential to design and implement better programs about sex and sexual health.

The researcher's contact information was included in the informed consents provided directly to middle school students and those participants that responded via flyer in the event that a parent or participant required further clarification. The completed questionnaire with the correct responses and explanations of the correct responses were mailed to each study participant that completed a study information leaflet.

The following additional precautions were taken to ensure that participant's rights were protected:

1. The participants were informed prior to the collection of the data via the assent/informed consent of how the data was to be collected and used. The data was used for the purposes of this research study only and completion of a doctoral dissertation. The researcher's contact information was also provided (to those participants recruited via middle schools and community flyers) in the event a parent or the participant had additional questions or concerns.
2. Only participants that willingly signed assent and were given parental consent were allowed to participate in the study.
3. Overall audience appropriate study results were mailed to those participants recruited via middle school and community flyers, once the results were available.
4. Each participant's needs were considered at all times during collection and reporting of the data.

5. Participants were notified in writing of the confidentiality process and who would have access to any de-identified information (Creswell, 2009, p.198).
    a. Demographic information (age, gender, ethnicity) was captured on the questionnaire; however, identifying information (initials, DOB, etc.) was not captured.
    b. A master participant list was created documenting the name of each child that signed a paper version of the child assent and provided parental consent as well as the names of the participants that contacted the researcher via email. Only the researcher had access to the master list at the time of data collection and after the data was collected. The master list and all related documentation of participation were shredded once all gift cards were mailed to participants who provided signed paper assent or contacted the researcher via email.
6. Data was kept as a password-protected file on the researcher's computer and backed up on a password-protected compact disk. Computer access was limited to the researcher and the backup disk was kept in a locked file cabinet in the researcher's office along with the master participant list. The raw data will be kept for five years post dissertation approval.
7. In the event of a breach of confidentiality or unauthorized access to the study data, participants and parents that were recruited via middle school and community flyer will be notified in writing and all data destroyed.

In the event that a participant experiences an acute psychological event as a result of completing the questionnaire, parents will be instructed to contact their child's pediatrician for referral to a mental health provider.

Summary

A cross sectional study design was used to address the research questions that aim to examine the relationships between age, gender, and ethnicity of seventh grade middle school students and their scores on the STD-KQ using chi-square and linear regression analysis. A sample of 207 students participated in this study. Recruitment methods ranged from direct distribution of study information to seventh grade students attending three Charlotte, North Carolina middle schools, flyers posted in community locations throughout New Jersey and in Charlotte and Chapel Hill, North Carolina, and the use of Survey Monkey Audience as an additional recruitment strategy. Survey data was collected using these recruitment methods and analyzed using SPSS. Chapter 4 will present the study results including relevant data tables and figures.

Chapter 4: Results

The purpose of this study was to determine if the STD-KQ was a valid and reliable tool to measure STD knowledge among seventh grade students in the United States, and to examine if differences exist between the independent variables--age, gender, and ethnicity--and the dependent variable--STD-KQ scores. Data were collected from study participants completing an online version of the 27-item STD-KQ. In this chapter, I present the results of this study, which is outlined by the following six main sections: face validity, content validity, STD-KQ reliability among the study population, population demographics and frequencies, findings related to Research Question 2 that examines the differences in STD-KQ knowledge scores by age, gender, and ethnicity, and findings related to Research Question 3 that examine if age, gender, and ethnicity predict STD-KQ knowledge scores.

Face Validity

Face validity is a superficial measure of validity and is based on how a procedure or assessment appears to measure a specific construct or concept, and is purely subjective; it represents how each respective respondent views a measure (Lund, 2012). For the purposes of this research, STD knowledge was considered a robust construct if at least four of five respondents agreed that it is measured by the STD-KQ. The STD-KQ has primarily been administered to adults age 18 and over and has not been administered in its entirety to this study population. In an effort to establish if the survey appeared to measure what was intended among seventh graders, a convenience sample of five seventh

grade students completed the survey and answered four open-ended questions with regard to their overall subjective impression of the survey. The four questions were as follows:

- Was this a good survey?
- Did you understand the questions?
- Do you think it measured what you know about sexually transmitted diseases?
- For the questions that you circled DK for Don't Know, do you truly not know the answers or were the questions confusing?

Of the five participants in this phase of the study, the demographics of this group were as follows: four were females and one was male, all five of the participants were 13 years old, three were Black, one was Caucasian, and one was Asian. Responses to the open-ended questions were similar among the participants. With regard to Question 1, "Was this a good survey?," four of the five participants answered yes. One participant went on to respond that the survey "…made you think about diseases that I was unaware of. It made me want to research what I didn't know about." Only one participant responded that the survey made her feel uncomfortable.

Question 2 asked, "Did you understand the questions?" and two participants answered that they understood some of the questions, and the remaining three participants answered "most," " yes," and "kind of." The responses to this question indicate that the participants are indeed familiar with the topic of STDs, which shows that this population has been exposed in some way to the information either through health education at school, at home, or from a media outlet, but more exposure is needed. With

regard to Question 3, all five participants responded that they think the survey measured what they know about STDs.

Lastly, Question 4 asked about the participants "don't know" responses to the STD-KQ questions and if their response truly meant they did not know the answer to the question. All five participants stated that they truly did not know the answers. The questions with the most don't know answers (n = 4) among the five participants were Question 2 that reads "Frequent urinary infections can cause Chlamydia" and Question 14 "Human Papillomavirus (HPV) can lead to cancer in women." This was followed by Question 22 (n = 3), which reads, "There is a vaccine that prevents a person from getting Chlamydia." Despite HPV being the most common STI among both males and females (CDC, 2012a), only one of the participants answered the question correctly (female). According to this examination of face validity in this study, the survey appears to measure STD knowledge among seventh graders, and they have an idea of what they are responding to with some level of understanding.

Content Validity

The STD-KQ underwent review by STD experts in its initial construction to evaluate the accuracy of questionnaire information and determine if any issues existed among the question language. The data from this review provided evidence for construct and content validity of the questionnaire by examining if questions matched the objective or several objectives and allowed expert feedback about question content, interpretation, and if any changes were suggested (Jaworski & Carey, 2006). Pilot studies were also conducted, but as previously mentioned, the study populations were significantly older

than this study population (ranging from 18-74 years old). Because of this significant age difference in questionnaire respondents, Lawshe's CVR was used to measure content validity in this population. SMEs rated each question as "essential," "useful, but not essential," or "not necessary" to the performance of what is being measured (i.e., the construct), which is STD knowledge. A CVR of 0 was interpreted to mean that half of the SMEs used in the measurement believed that the item is essential; therefore, a CVR > 0 indicated that more than half of the SMEs considered an item essential (Lawshe, 1975). Lawshe also stated that two assumptions could be made with regard to an item's content validity: (a) that an item that is thought to be "essential" by more than half of the SMEs has some level of content validity, and (b) that the higher the CVR is over 0, the greater the level of an item's content validity. Lawshe went on further to institute minimum CVRs based on the number of SMEs and on a one-tailed test at the $\alpha = 0.05$ significance level that are used to determine which items would remain in an assessment or be removed. Table 2 shows the minimum required CVR values as determined by Lawshe (1975).

Table 2

Minimum CVR Values by Number of Subject Matter Experts (SMEs)

Number of SMEs	5	8	10	15	20	25	30	35	40
Minimum CVR	0.99	0.75	0.62	0.49	0.42	0.37	0.33	0.31	0.29

When determining what questions to include on a new assessment, the items that meet minimum CVR values are retained and the average of the CVRs or content validity

index across retained questions on the assessment can be taken as a measure of the overall content validity of the selected questions. For the purposes of this study, questions were not removed and a content validity index was not calculated; the entire survey was administered. Lawshe's (1975) CVR was used to solely demonstrate content validity of individual STD-KQ items. The assumptions indicated by Lawshe were how items in the STD-KQ were measured to have validity due to the STD-KQ not being modified to fit this population for this study. Eight SMEs were recruited for content validity measures and included three Ph.D.'s (two college professors with doctorates in Health Sciences and one doctorate in Psychology) and five middle school instructors who teach health courses to middle school students in Piscataway, New Jersey (four Health Education instructors) and Houston, Texas (one instructor of Science & Global Health).

STD-KQ Item Responses

Subject matter expert responses *(n* = 8*)* to each STD-KQ item with their respective CVR are found in Table 3.

Table 3

STD-KQ Item Ratings by SMEs (n = 8)

Item number	Essential (E)	Useful, but not essential (U)	Not necessary (N)	CVR
1*	2	2	3	-0.5
2	4	2	2	0
3	7	0	1	0.75
4	7	1	0	0.75
5	4	4	0	0
6	5	1	2	0.25
7	4	2	2	0
8	7	0	1	0.75
9	8	0	0	1
10*	4	1	2	0.14
11	3	2	3	-0.25
12	6	2	0	0.5
13	6	0	2	0.5
14*	6	1	0	0.71
15	4	2	2	0
16	8	0	0	1
17	4	1	3	0
18*	1	5	1	-0.71
19	5	2	1	0.25
20	7	0	1	0.75
21	7	1	0	0.75
22	5	2	1	0.25
23	4	2	2	0
24	7	1	0	0.75
25	4	3	1	0
26	5	3	0	0.25
27	6	2	0	0.5

Note. * Denotes the number of SMEs who rated the question was $n = 7$.

Two questions, 9 and 16, had CVRs of 1.0 where all eight SMEs rated the questions as essential. These two questions were “A woman who has Genital Herpes can pass the infection to her baby during childbirth” and “Sexually Transmitted Diseases can

lead to health problems that are usually more serious for men than women," respectively. Seven questions, Numbers 3, 4, 8, 14, 20, 21, and 24 had CVRs of 0.71 and 0.75 with seven SMEs rating the questions with a CVR of 0.75 as essential. For Question 14, seven of eight SMEs rated the question, which is the reason for the CVR of 0.71. The questions with CVRs of 0.71 and 0.75 are as follows:

- **Question 3.** There is a cure for Gonorrhea.
- **Question 4.** It is easier to get HIV if a person has another Sexually Transmitted Disease.
- **Question 8.** There is a cure for Chlamydia.
- **Question 14.** Human Papillomavirus (HPV) can lead to cancer in women.
- **Question 20.** A woman can tell by the way her body feels if she has a Sexually Transmitted Disease.
- **Question 21.** A person who has Genital Herpes must have open sores to give the infection to his or her partner.
- **Question 24.** If a person had Gonorrhea in the past he or she is immune (protected) from getting it again.

Three questions had CVRs of 0.50, Questions 12, 13, and 27. For these questions, six of seven SMEs rated the questions as essential. Although Question 14 had six SMEs rate the question as essential, the reason for the higher CVR was that the total number of SMEs evaluating was $n = 7$ instead of $n = 8$. The questions with CVRs of 0.50 are as follows:

- **Question 12.** Human Papillomavirus (HPV) can cause Genital Warts.

- **Question 13.** Using a natural skin (lambskin) condom can protect a person from getting HIV.
- **Question 27.** There is a vaccine that can protect a person from getting Hepatitis B.

According to Lawshe's (1975) assumptions, 17 of the 27 questions have some level of validity due to more than half of the SMEs rating the items as essential, which is equivalent to almost two-thirds of the questions on the STD-KQ. Of the 10 questions with CVRs that were equal to or fell below 0, seven of the items had a CVR of 0 indicating that half of the SMEs rated the question essential.

STD-KQ Reliability Among Study Population

Reliability of a measure is indicative of its consistency or the relatedness of items within a measure. For the purposes of this study, internal consistency reliability was measured using Cronbach's alpha (α) and an alpha of greater than or equal to .70 is considered acceptable (Cronbach, 1951). Responses to STD-KQ questions from the entire study population (n = 207) were grouped by disease (Genital Herpes, Chlamydia, Gonorrhea, HPV/Genital Warts, and Hepatitis B) with the exception of HIV, by all questions in the survey grouped together, except those related to HIV, and all 27 questions including those related to HIV. HIV questions were not measured for internal consistency reliability as an individual group because most public school curricula teach students about HIV more than any other STD (Anwar et al., 2010). Tables 4 through 8 illustrate the results of the reliability analysis.

For the two questions in the STD-KQ that refer to Genital Herpes (HSV), Table 4 shows that based on answers to these questions from the sample of participants, the correlation between Questions 9 and 21 is weakly positive (.093) with α = .170. This weakly positive alpha indicates that the questions have no internal consistency. Table 5 also illustrates a very weakly positive interitem correlation matrix between the four questions on the STD-KQ that relate to Chlamydia (.111, .185, .196, .208, .264). The alpha of .496 indicates that the four questions have an unacceptable level of internal consistency reliability.

Table 4

Interitem Correlation Matrix – HSV (n = 207)

	Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	Cronbach's Alpha (α)
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth		.093	.170

Table 5

Interitem Correlation Matrix – Chlamydia (n = 207)

	Q2. Frequent urinary infections can cause Chlamydia	Q8. There is a cure for Chlamydia	Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	Q22. There is a vaccine that prevents a person from getting Chlamydia	Cronbach's Alpha (α)
Q2. Frequent urinary infections can cause Chlamydia		.185	.208	.264	.496
Q8. There is a cure for Chlamydia	.185		.217	.196	
Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	.208	.217		.111	
Q22. There is a….	.264	.196	.111		

The interitem correlation matrix for questions related to Gonorrhea demonstrated by Table 6 shows a weak positive correlation between Questions 3 and 10 (.250), and very weakly positive correlations between Questions 3 and 19 (.054) and 3 and 24 (.122). There is a slightly higher positive correlation between Questions 10 and 19 (.331), 10 and 24 (.372), and 19 and 24 (.286). The α =.554 for this group of questions demonstrates no internal consistency reliability.

Table 6

Interitem Correlation Matrix – Gonorrhea (n = 207)

	Q3. There is a cure for Gonorrhea	Q10. A woman can look at her body and tell if she has Gonorrhea	Q19. There is a vaccine available to prevent a person from getting Gonorrhea	Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	Cronbach's Alpha (α)
Q3. There is a cure for Gonorrhea		.250	.054	.122	.554
Q10. A woman can look at her body and tell if she has Gonorrhea	.250		.331	.372	
Q19. There is a vaccine available to prevent a person from getting Gonorrhea	.054	.331		.286	
Q24. If a person had…	.122	.372	.286		

Table 7 is the interitem correlation matrix for STD-KQ questions relating to Genital Warts and HPV. This table shows that there are weak positive correlations between all questions. The α =.661 illustrates that there is not acceptable internal consistency reliability among these questions; however, this may have been negatively affected by the larger number of questions in this group with weak correlations compared to the other STD groups. HPV is the most common STD among males and females (CDC, 2012a), so this STD having the largest number of questions second to HIV illustrates the importance of this subset in gauging STD knowledge among this

population and all other populations.

Table 7

Interitem Correlation Matrix – Genital Warts and HPV (n = 207)

	Q5. Human Papilloma Virus (HPV)	Q12. Human Papilloma Virus (HPV)	Q14. Human Papilloma Virus (HPV)	Q15. A man must have vaginal sex	Q25. Human Papilloma Virus (HPV)	Q26. A man can protect himself from getting Genital Warts	Cronbach's Alpha (α)
Q5. Human Papilloma Virus (HPV)		.101	.254	.357	.488	.234	.661
Q12. Human Papilloma Virus (HPV)	.101		.332	.248	.053	.119	

(cont'd)

Q5. Human Papilloma Virus (HPV)	Q12. Human Papilloma Virus (HPV)	Q14. Human Papilloma Virus (HPV)	Q15. A man must have vaginal sex	Q25. Human Papilloma Virus (HPV)	Q26. A man can protect himself from	Cronbach's Alpha (α)
Q14. Human Papilloma Virus	.254	.332		.274	.257	.107
Q15. A man must have vaginal sex	.357	.248	.274		.264	.362
Q25. Human Papilloma Virus (HPV)	.488	.053	.257	.264		.242
Q26. A man…	.234	..119	.107	.362	.242	

Questions 6 and 23 and 23 and 27 related to Hepatitis B, have very weakly positive relationships and Questions 6 and 27 have a weakly positive relationship as well, as illustrated by the matrix in Table 8. The α = .281 also illustrates that there is no internal consistency reliability among this group of questions.

The correlation matrices of STD subsets as represented in Tables 4-8 consisted of all positive correlations, albeit mostly all were weak. This does indicate that each individual subset of questions was related to one another. However, α = .823, for the entire subset examined as a whole (Appendix I), which demonstrated an acceptable level of internal consistency reliability among this subset of questions. In addition, the entire 27 item STD-KQ had a α = .857 which also demonstrated an acceptable level of reliability.

There were no modifications made to the STD-KQ post validity and reliability tests given that the validity sample of 7th graders understood the items in the questionnaire and the items do appear to measure STD knowledge. In addition, a readability index was performed on the questionnaire prior to the study data being collected. The readability score was a grade level 5 and the questionnaire received an "easy to read" rating (Appendix A).

Table 8

Interitem Correlation Matrix – Hep B (n = 207)

	Q6. Having anal sex increases a person's risk of getting Hepatitis B	Q23. A man can tell by the way his body feels if he has Hepatitis B	Q27. There is a vaccine that can protect a person from getting Hepatitis B	Cronbach's Alpha (α)
Q6. Having anal sex increases a person's risk of getting Hepatitis B		.014	.224	.281
Q23. A man can tell by the way his body feels if he has Hepatitis B	.014		.108	
Q27. There is a vaccine…	.224	.108		

Summary of Survey Data Collection

As stated in Chapter 3, participants were recruited for the survey through several methods from June 11, 2014 through November 21, 2014, and included direct recruitment from four middle schools in North Carolina, flyers posted in libraries, YMCAs, and Boys and Girls Clubs in New Jersey and North Carolina, and via Survey Monkey Audience which has access to participants through a nationwide pool of parent members with seventh grade children. Data was collected for 199 participants using Survey Monkey Audience, five from direct recruitment from middle schools, and three from community flyers. The data did not differ by STD knowledge score and recruitment method based on recruitment source. For the purposes of analysis, STD knowledge scores

of 0 were considered outliers and were removed (*n =11*). Of the participants with an STD score of 0, seven were age 13 and four were age 12; four were male and seven were female; two were Black, four were White, three were Asian/Pacific Islander, and two were Hispanic. The final sample size was 196 participants.

Study Population Demographics

A total of 196 study participants completed the STD-KQ for the purposes of this research study. Demographic data consists of participant age, gender, and ethnicity and the breakdown of this data is presented in Table 9. The age distribution of the study participants indicates that 66.3% (*n* = 130) were 13 year olds and 33.7% were 12 years old (*n* = 66). A similar proportion of participants were represented by gender where 61.2% (*n* = 120) of the study participants were females compared to 38.8% (*n* = 76) male. Ethnic distributions demonstrate that the majority of study participants, 64.3% (*n* = 126) were White followed by 19.4% (*n* = 38) of participants were Black; 6.6% (*n* = 13) were Hispanic; 4.6% (*n* = 9) were Asian/Pacific Islander, and 5.1% (*n* = 10) were “Other”.

Table 9

Participant Demographics (n = 196)

Variable	Frequency	%
Age		
12	66	33.7
13	130	66.3
Gender		
Male	76	38.8
Female	120	61.2
Ethnicity		
Black	38	19.4
White	126	64.3
Asian/Pacific Is.	9	4.6
Hispanic	13	6.6
Other	10	5.1
Total	196	100

Differences in STD-KQ Scores by Independent Variables

Individual STD-KQ data was collected for each participant and only those participants that provided completed surveys were used in the study. Each true, false, and don't know answer of the 27-item questionnaire was coded into nominal data (true=1, false=2, don't know=3) for each participant. The correct answer for each question was given a score of 1 and the incorrect and Don't Know answers were given a score of 0. Each participant's questions were scored as a 0 or 1 dependent upon if the answer was correct, and the scores were added for all 27 items giving an overall STD-KQ score ranging from 0-27. In addition, the STD-KQ scores were coded into categorical data

(STD-KQ score of 0-9=low score, 10-18=moderate score, 19-27=high score) for purposes of analyzing data using Chi-square.

The independent variables were age, gender, and ethnicity and these variables were analyzed to answer research question 2 and to determine if (a) STD-KQ scores were significantly different among 12 and 13 year olds, (b) scores significantly differed between male and female participants, and (c) if scores significantly differed by ethnicity. Frequencies of categorical STD-scores and Chi-square analysis of age, sex, and ethnicity and STD score are illustrated in Table 10.

According to frequency table 10, over half (57.1%) of the study participants had moderate STD-KQ scores ranging from 10-18 points. This category indicates that over half of the study participants (n = 112) have moderate knowledge about STDs. With regard to age and STD-KQ score, more participants scored moderately on the STD-KQ in both age groups than those that scored low and high (51.5% and 60%) and a higher proportion of 13 year olds scored moderately than 12 year olds. Conversely, there was a higher proportion of 12 year old participants that scored high on the STD-KQ (24.2%) than 13 year olds that scored high (10.8%). As demonstrated in Table 10, the proportion of participants that scored low, medium, and high were relatively the same between both genders.

Table 10 also demonstrates that a higher proportion of Hispanic, Other, and Black had high STD-KQ scores (23.1%, 20%, and 15.8%, respectively) compared to White and Asian/PI participants (14.3% and 11.1%). With regard to moderate STD-KQ scores, Hispanic and Black participants had higher proportions (69.2% and 60.5%, respectively)

compared to White, Asian/PI, and Other (56.3%, 55.6%, and 40%, respectively). In addition, Whites, Asian/PI, and Other had higher proportions of low scores compared to Black and Hispanic participants (29.4%, 33.3%, and 40% vs. 23.7% and 7.7%, respectively).

Results from the chi-square analysis of the independent variables and the dependent variable of categorical STD-KQ score (Table 10) indicate that a significant association exists between age, and STD-KQ score (p = .046). There was no association shown between gender or ethnicity and STD-KQ score (p =. 987 and p =. 791, respectively). Based on statistically significant results for the association between age and STD-KQ score, the null hypothesis is rejected in favor of the alternative hypothesis for research question 2. A significant difference in STD scores by age exists; however, the data illustrates that in this sample, a greater percentage of 12 year olds had higher knowledge scores than 13 year olds. Conversely, more 13 year olds had moderate knowledge scores than 12 year olds.

Table 10

Frequency by Age, Gender, and Ethnicity of Categorical STD-KQ Score (n = 196)

Variable		Knowledge Level			%	Chi-square		
		Low	Moderate	High		x^2	*df*	*p*
Age						6.139	2	.046
	12	16	34	16	33.7			
	%	24.2	51.5	24.2				
	13	38	78	14	66.3			
	%	29.2	60.0	10.8				
Gender						.026	2	.987
	Male	21	43	12	38.8			
	%	27.6	56.6	15.8				
	Female	33	69	18	61.2			
	%	27.5	57.5	15.0				
Ethnicity						4.682	8	.791*
	Black	9	23	6	19.4			
	%	23.7	60.5	15.8				
	White	37	71	18	64.3			
	%	29.4	56.3	14.3				
	Asian/PI	3	5	1	4.6			
	%	33.3	55.6	11.1				
	Hispanic	1	9	3	6.6			
	%	7.7	69.2	23.1				
	Other	4	4	2	5.1			
	%	40.0	40.0	20.0				
	Total	54	112	30	196			
	% of Total	27.6	57.1	15.3	100.0			

Note. * 6 cells (40.0%) have expected count less than 5.

The mean STD-KQ score was 12.49 with a standard deviation of 5.51 (68% of the population scored between seven and 18 on the STD-KQ). Figure 2 illustrates the mean STD-KQ score across the study population and also shows that 50% of the study population's scores were between nine and 17 with 25% being higher than 17 and 25% being lower than nine.

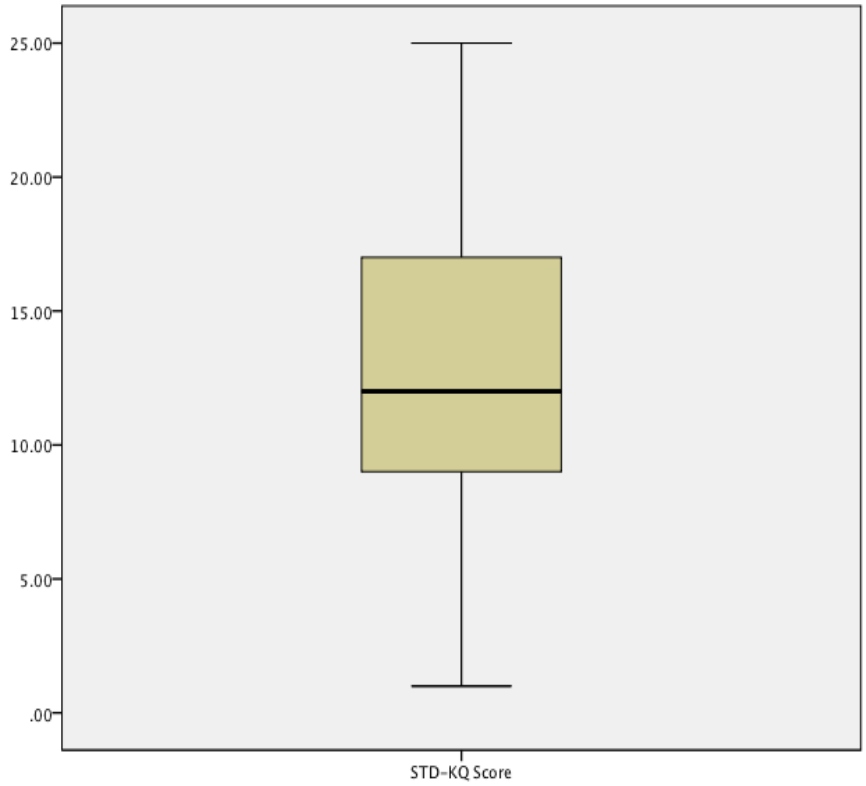

Figure 2.Boxplot of STD-KQ scores – total study population. The mean STD knowledge score for the sample population was 12.49 (*SD* = 5.51).

Figure 3 illustrates the mean STD-KQ scores by age and demonstrates that 12 year olds mean scores were slightly higher than their 13 year old counterparts. However, 12 year olds had more scores in the higher category and fewer scores in the lower

category than 13 year olds, which demonstrates that 13 year olds had more moderate scores than 12 year olds.

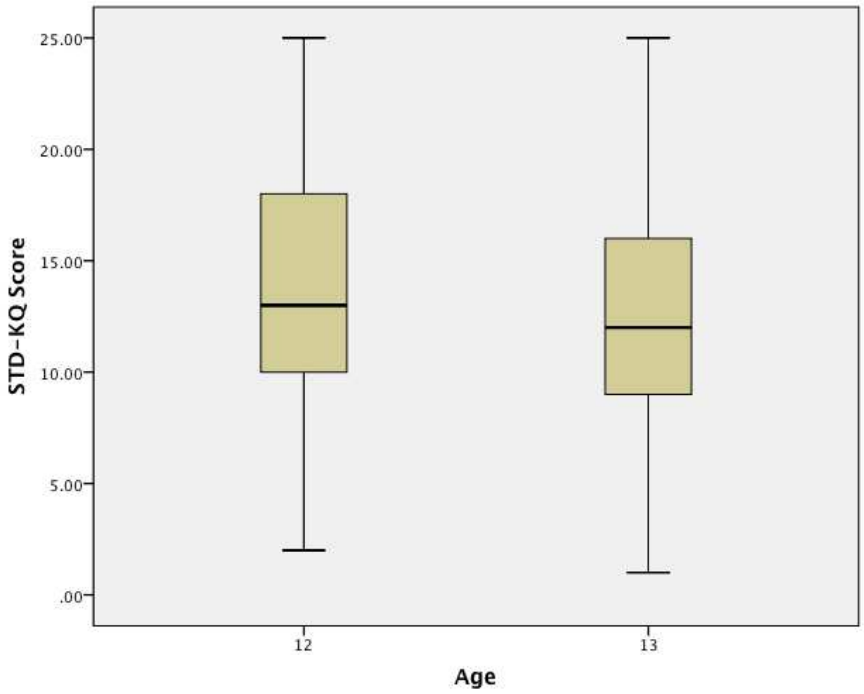

Figure 3. Boxplot of STD-KQ Scores by Age. The mean STD knowledge score was 13.19 for 12 year olds (SD=5.82) and 12.13 for 13 year olds (SD=5.34).

Figure 4 illustrates that the mean STD-KQ scores are roughly the same between genders, however 50% of female scores were slightly higher than 50% of male scores and the number of lower scores was also roughly equal between genders.

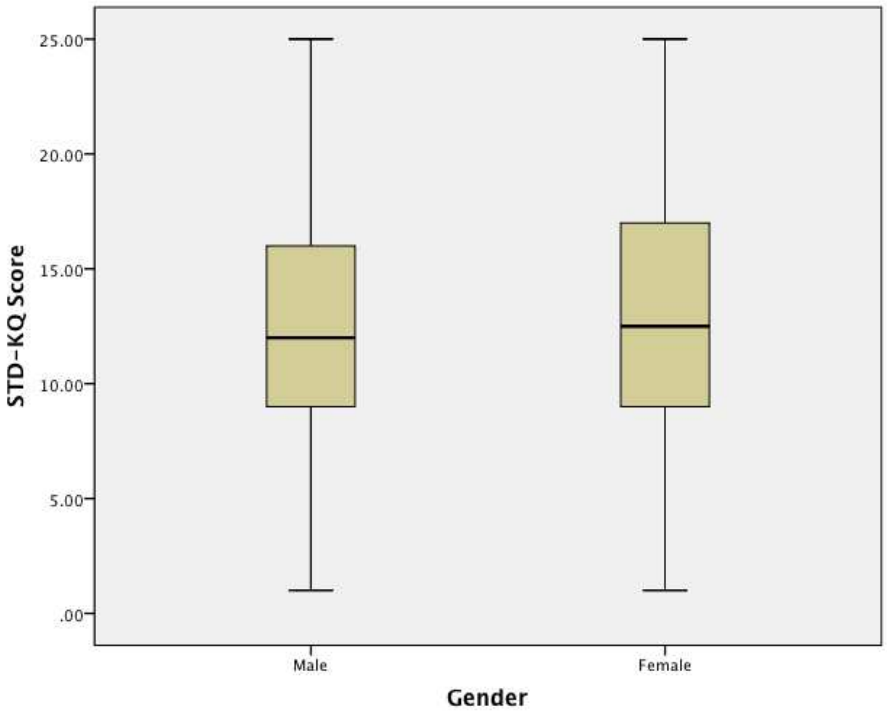

Figure 4. Boxplot of STD-KQ Scores by Gender. The mean STD knowledge score was 12.27 for males (SD=5.42) and 12.63 for females (SD=5.59).

Figure 5 illustrates that the mean scores between ethnicities are relatively similar with Asian/Pacific Islanders having higher mean scores than all other ethnic categories, followed by Blacks. White and Hispanic mean scores were similar; however, the ethnicity of "Other" had mean scores that were lower than all other ethnic categories. Means and standard deviations for STD knowledge score were calculated quantitatively for each ethnic group. Hispanics were actually found to have the highest mean followed by Asian/PI, Black, White, and Other, respectively. One assumption for the quantitative difference versus the boxplot illustration of means is that Hispanics had the highest minimum range of STD knowledge scores (minimum of eight) than all groups

collectively (minimum scores for Black, White, Asian/PI were one; minimum score for Other was two).

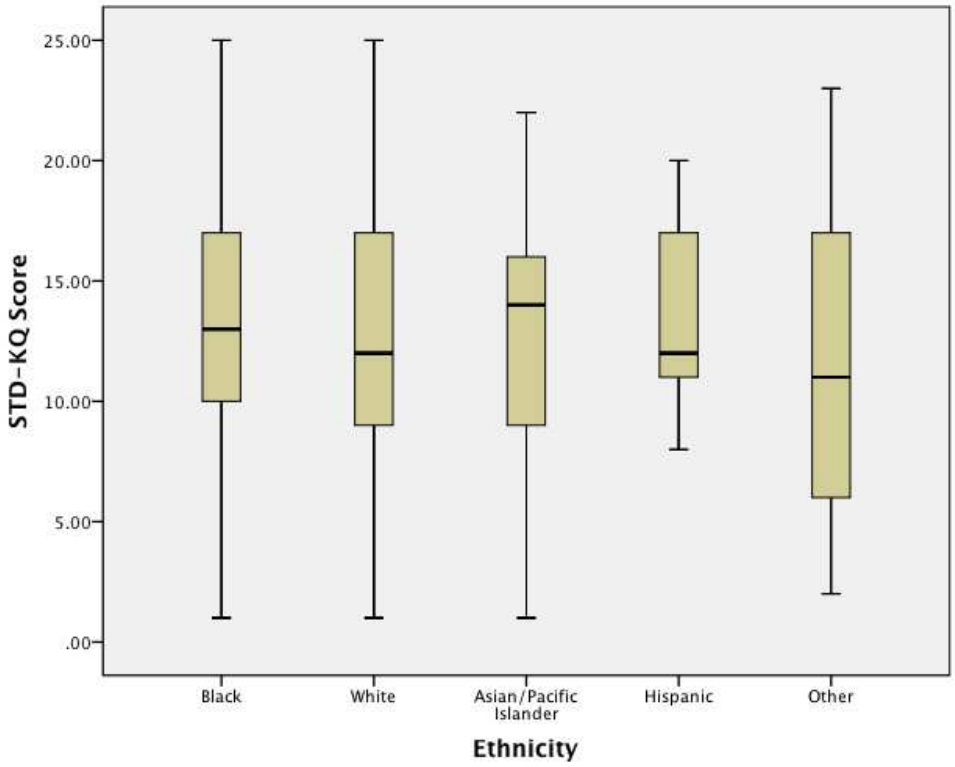

Figure 5. Boxplot of STD-KQ Scores by Ethnicity. The mean STD knowledge score was 12.76 for Blacks (SD=6.18), 12.32 for Whites (SD=5.29), 12.77 for Asian/PI (SD=6.28), 13.84 for Hispanic (SD=3.93), and 11.60 for Other (SD=7.29).

Table 11 illustrates the Don't Know response frequencies on the STD-KQ among the study population. According to the frequency table, approximately 65% of respondents had 10 or fewer Don't Know responses and 35% had 10 or greater. The highest percentage of Don't Know responses was 0, 5, 3, 6, and 2 with 13.5%, 8.7%, 7.2%, 6.8%, and 5.3% respectively. Eight respondents (3.9%) answered all 27 STD-KQ items as Don't Know.

Table 11

Frequency of Don't Know Responses (n = 196)

Number of Don't Know responses	Frequency	Percent
.00	28	13.5
1.00	9	4.3
2.00	11	5.3
3.00	15	7.2
4.00	9	4.3
5.00	18	8.7
6.00	14	6.8
7.00	10	4.8
8.00	8	3.9
9.00	7	3.4
10.00	5	2.4
11.00	6	2.9
12.00	10	4.8
13.00	5	2.4
14.00	3	1.4
15.00	5	2.4
16.00	6	2.9
17.00	4	1.9
18.00	1	.5
19.00	4	1.9
20.00	4	1.9
21.00	3	1.4
22.00	2	1.0
23.00	4	1.9
24.00	2	1.0
25.00	3	1.4
26.00	3	1.4
27.00	8	3.9
Total	207	100.0

Assumptions for Using Linear Regression

The assumptions for using linear regression were tested for the data and were found to be acceptable. Figures 6-10 show the normal distribution, linearity, test of heteroscedasticity, and auto-correlation (using scatterplots) of the data. Tolerance (T) and variance inflation factor (VIF) were used to test multicollinearity; T = .967, .997, and .970 for age, gender, and ethnicity which are all > 0.1 and VIF =1.03 for age and ethnicity and 1.00 for gender (Field, 2000, p.128; Statistics Solutions, 2014). The independent variables of age, gender, and ethnicity are categorical; linearity is shown as a vertical line rather than the expected points along a slope.

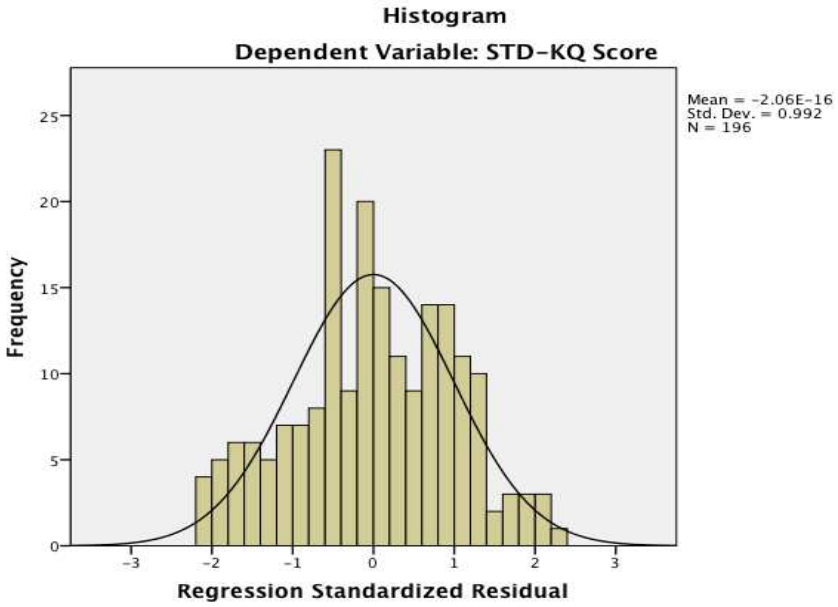

Figure 6. Histogram of STD-KQ Scores for Normal Distribution

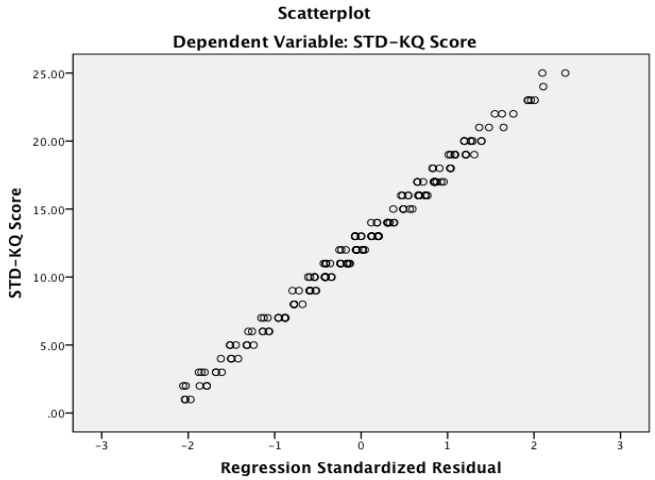

Figure 7. Scatterplot of STD-KQ Scores for Linearity

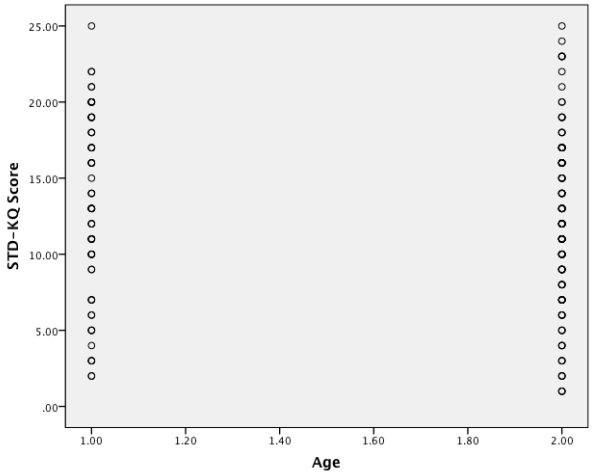

Figure 8. Scatterplot of Age and STD-KQ Scores for Linearity

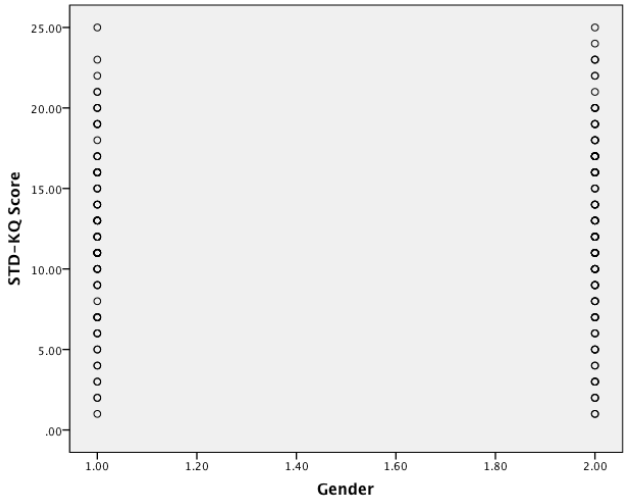

Figure 9. Scatterplot of Gender and STD-KQ Scores for Linearity

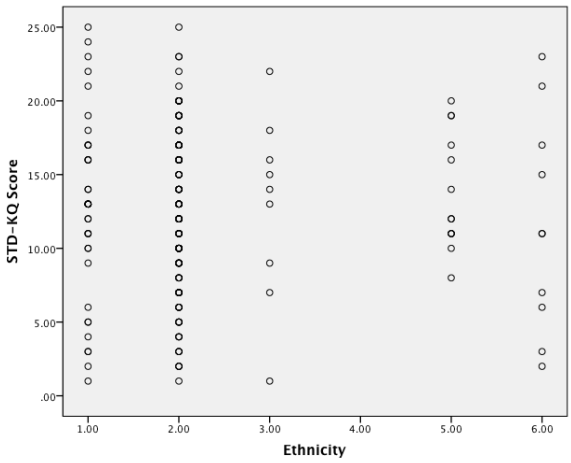

Figure 10. Scatterplot of Ethnicity and STD-KQ Scores for Linearity

Age, Gender, and Ethnicity as Predictors of STD-KQ Score

Multiple linear regression analysis was used to determine if age, gender, and ethnicity could predict STD-KQ scores among this study population (Table 12). The

actual STD-KQ scores (0-27) were used for this analysis versus the categorical scores of low, moderate, or high used in previous analysis to show if differences in scores exist. The analysis shows that no predictor was statistically significant ($p \leq 0.05$). Therefore, the null hypothesis of research question 3 is accepted, indicating that age, gender, and ethnicity do not predict STD-KQ scores among this population.

Table 12

Multiple Linear Regression Analysis of Age, Gender, and Ethnicity as a Predictor of STD-KQ Score (n = 196)

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	13.753	2.125		6.471	.000	9.561	17.944
Age	-1.101	.851	-.094	-1.294	.197	-2.779	.577
Gender	.414	.813	.037	.510	.611	-1.189	2.017
Ethnicity	-.042	.319	-.010	-.132	.895	-.670	.586

Summary

This chapter provided the results of the study, which examined STD-KQ scores of seventh graders ages 12 and 13, attending public school in the United States. The key study results are as follows:

Face validity was performed among five seventh grade students and demonstrated that most of the respondents thought the survey was good and measured what it was intended to measure. Most of the respondents understood the questions and were familiar with its content. For questions that were answered as “Don’t Know”, the respondents

clearly indicated that they did not know the answers to the questions being asked. Content validity was performed using Lawshe's CVR and eight subject matter experts and demonstrated that 17 of the 27 questions have some level of validity due to more than half of the SMEs rating the items as essential, which is equivalent to almost two-thirds of the questions on the STD-KQ.

Reliability of the STD-KQ was examined among this population using the entire sample of 207 study participants and was measured using Cronbach's alpha (α). STD-KQ questions were grouped by disease (Genital Herpes, Chlamydia, Gonorrhea, HPV/Genital Warts and Hepatitis B). The alpha for the collective subset of questions from the sample population with outliers removed was .844, which demonstrates acceptable internal consistency reliability among these items that include STDs other than HIV. The alpha for the subset of questions based on the responses from the entire study population was .823, also demonstrating acceptable internal consistency reliability.

Null hypothesis 2 was rejected for age but not rejected for gender and ethnicity. Chi-square analysis demonstrated significant differences in age and STD-KQ score (p = .046). Null hypothesis 3 was accepted as age, gender, and ethnicity were not significant predictors of STD-KQ score. Chapter 5 will discuss details of the results presented in this chapter and how they compare to the literature reviewed, implications and recommendations for future research and the potential impact on public health.

Chapter 5: Discussion, Conclusions, and Recommendations

Increased incidence of STDs and poor health outcomes among adolescents are an ongoing public health problem that must be addressed. As the age of onset of sexual activity has been decreasing over the years, this phenomenon has been shown to contribute to the increased incidence in STDs, especially those other than HIV/AIDS (CDC, 2010; Lohman & Billings, 2008). Approximately 10 million new sexually transmitted infections occur each year among adolescents and young adults age 15 to 24, and this number does not appear to be decreasing (CDC, 2012a). The purpose of this study was to examine how much seventh graders in the United States know about STDs, and if STD knowledge scores are impacted by age, gender, and ethnicity. Using these demographic variables will contribute to understanding what this population knows with regard to STDs and sexual health, and if sexual health curricula needs to be adjusted and tailored for certain groups within this population.

A quantitative, cross-sectional design was employed in this study to assess STD knowledge of seventh grade students in the United States using the STD-KQ, which was administered via the Internet using Survey Monkey. The data were analyzed using chi-square analysis to examine if STD knowledge score differed by age, gender, and ethnicity. Multiple linear regression was used to determine if these same variables are predictors of STD knowledge scores. Validity of the STD-KQ was also measured for use in this study population using face validity and content validity, and reliability of the instrument was measured using Cronbach's alpha. Mean scores by age, gender, and

ethnicity were illustrated, and Don't Know response frequencies were calculated to further examine level of STD knowledge among this study population.

An interpretation of the findings as they relate to the research questions and prior research is presented in this chapter as well as recommendations for educational changes, suggestions for future research, and implications for social change.

Interpretation of Findings

The findings presented in this study from the sample of 196 participants in the seventh grade across the United States demonstrate the social and cultural influence on STD knowledge among this population. The findings are discussed in reference to the research results presented in Chapter 4 and the literature review discussed in Chapter 2.

Research Question 1

Research Question 1 asked the following: Is the STD-KQ a valid and reliable measurement tool of STD knowledge among seventh grade students? Validity was measured using face and content validity; five seventh graders participated in the face validity phase and eight SMEs participated in the content validity phase. Face validity represents some indication that what is attempted to be measured is being measured. Using members of the study population provides insight to what impression the measurement made, how the measurement is received, and if the tool measures what it is intended to measure (Babbie, 2010, p.153). According to the definition of face validity, the STD-KQ is a valid measure of STD knowledge among this population with a majority of the participants stating that they felt the tool was indeed a good tool that measured their knowledge.

Lawshe (1975) defined content validity as the level a test adequately represents its content. According to Babbie (2010), content validity "refers to a measure that covers a range of meanings related to a concept" (p. 155). In this case, the concept and content is STDs and the STD-KQ covers a range of some of the most common STDs (chlamydia, gonorrhea, genital warts/HPV, hep B, HIV/AIDS), some of which represent high incidence among young people. In the initial creation of the STD-KQ, this instrument was only administered to adults aged 18 to 74 and STD experts comprised of nurses and medical doctors who reviewed the questions for accuracy, indicated problems with how statements were worded, and provided evidence of validity for the instrument. For the purposes of this study, SMEs were used to measure validity of the instrument among this population. Jaworski and Carey (2007) measured internal consistency of all 27 items using Cronbach's alpha and resulted in $\alpha = .86$. For the subset of questions used in this study, $\alpha = .823$, based on the entire population's data demonstrated an acceptable level of internal consistency among this population. In addition, the alpha was measured using 20 of the 27 items in the questionnaire pertaining to STDs other than HIV/AIDS. This alpha represents a strong indication that similar results among this age group should be seen upon repeated measure. The purpose for using the subset of 20 questions that pertain to STDs other than HIV/AIDS is that more is known about HIV/AIDS than any other STDs (Anwar et al., 2010); however, incidence rates of chlamydia and gonorrhea were the second highest among our youth aged 15 to 19 (CDC, 2014a). The results of internal consistency among the subset of questions support the use of the entire STD-KQ within this population and can be considered an appropriate tool to assess knowledge as prior

research has only previously used a 10-question subset of the survey (Swenson et al., 2009).

Research Question 2

Research Question 2 asked, "Are there differences in STD knowledge scores among seventh graders with regard to age, gender, and ethnicity?" A significant difference was found between age and STD knowledge score; however, there was no significance found with gender and ethnicity. In this study, more 13 year olds had moderate levels of knowledge compared to 12 year olds. Further analysis illustrated that mean STD knowledge scores were slightly higher for 12 year olds, and they also had more participants who achieved a score that fell into the high category, while 13 year olds had more participants with lower scores. These results demonstrate that age plays a role in STD knowledge score; however, other social factors may influence these scores allowing for younger participants to score higher. These factors may include socioeconomic factors, sexual history, high risk behavior, and family communication level, which have been examined in previous research (Andersson-Ellström & Milsom , 2002; Johnson et al., 2006; Rouner & Lindsay, 2006).

Prior research has indicated that adolescents need more education about STDs other than HIV/AIDS. Conversely, in examining prior research related to STD knowledge, age was not a frequently isolated variable examined, so it is not entirely clear how this result compares to other findings from this perspective. In looking at prior studies conducted in the United States, the mean age in the study conducted by Clark et al. (2002) was 16 for female and 17 for males, while Davis and Niebes-Davis's (2010)

longitudinal study using Add Health data had a mean age of 16 as well. Clark et al. did find that older adolescents had higher scores than their younger counterparts; however, this difference was minimal. In this current study, I specifically examined data from 12 and 13 year olds only, with no other age groups incorporated. In addition, STD knowledge was one of multiple outcomes examined in prior research, using differing constructs of the term and alternate measures of knowledge, which could impact study results and participant interpretation.

There were no significant differences in gender and STD knowledge scores found in this study; however, scores for 50% of females were found to be slightly higher than 50% of males. This finding supports the results found in the study by Clark et al. (2002) across total knowledge score by curable and incurable STDs, where scores did not differ significantly. Although gender has been a frequently examined variable, prior research examining how it impacts STD knowledge has also been minimal, especially among this age group, and has usually been examined with other variables as well. Anwar et al. (2010) examined STD knowledge in conjunction with sexual activity among males and females ages 16 to 20, and Andersson-Ellström and Milsom (2002) examined STD knowledge scores among older adolescent females and young adult females only. Behavioral factors serve as the primary focus of prior research examining gender differences, and these factors clearly demonstrate differences in STD knowledge based on age of sexual debut, number of partners, and numerous environmental influences (Forhan et al, 2009; Lohman & Billings, 2008; Senn & Carey, 2011). The nonsignificant findings between gender and STD knowledge score found in this study truly cannot be

compared to the previous studies mentioned here. This is because no other prior researcher identified during the conduct of this study completely isolated gender as a variable solely compared to STD knowledge.

Differences in STD knowledge scores were also not significant by ethnicity in this study. Prior research has examined this sociodemographic rather frequently; however, as with gender, this factor has sociocultural implications with regard to behaviors as well as STD knowledge (Caputo, 2009; Davis & Niebes-Davis, 2010; Johnson et al., 2006; Newbern et al., 2004). The results in this study support the study by Clark et al. (2002) where there was also no significant difference found in STD knowledge scores by ethnicity (Black, White, Latino, Other). As mentioned previously for gender, ethnicity has been shown to significantly impact STD knowledge when paired with other factors such as behavior and economic factors. Contradictory to what was found in this study and the study by Clark et al., Davis and Niebes-Davis (2010) found that Hispanic youth had higher levels of sexual knowledge than Whites and Blacks, and Whites had the lowest amount of knowledge. This study illustrated that the mean STD scores differed by ethnicity, albeit not significantly. Blacks had the highest mean score followed by Whites and Hispanics, which were approximately equal, and lastly by Asian/Pacific Islander and Other, which were relatively equal. Despite the findings in this study, there are differences to consider. Davis and Niebes-Davis examined sexual knowledge that consisted of contraception, sex, and pregnancy. This is a considerably different outcome measure than STD knowledge score alone, and their concept coupled with ethnicity did exhibit significant results contrary to the literature reviewed in Chapter 2.

Research Question 3

Research Question 3 asked, " Does age, gender, and ethnicity predict STD knowledge score among seventh graders?" In this research study, age, gender, and ethnicity were not found to be significant predictors of the STD knowledge score. It is clear that other factors are better suited to predict the STD knowledge score as found in the study by Clark et al. (2002), which attributed behavioral factors such as sexual activity and prior exposure to an STD as an indicator of knowledge rather than the factors of age, gender, and ethnicity alone. Sociocultural and environmental influences must also be taken into account as factors that predict STD knowledge scores since previous research has shown that level of knowledge is multifaceted and cannot be explained using individual contributors. Davis and Niebes-Davis (2010) examined the perception of future certainty of four variables--life, health (STI risk), marriage, and college--as predictors of sexual knowledge and sexual attitudes. They found a low degree of prediction of sexual knowledge versus sexual attitudes, indicating that the knowledge variable may be a more difficult concept to predict or find a fitting model for, which can account for greater variability. Again, additional socioeconomic, demographic, and cultural factors must be considered in conjunction with age, gender, and ethnicity to get a clear understanding of exactly what influences such complex concepts and phenomena.

Interpretation of Findings From a Theoretical Perspective

Social cognitive and subjective culture theories were used as an integrative approach to examine demographic variables and the STD knowledge score in this study. Social cognitive theory is based on imitation, environmental influence, and cognitive

learning as a rationale for behavior choices (Bandura & McDonald, 1963). Environment and level of cognition have an influence on demographic factors such as age and gender and impact how different age groups and genders behave, learn, and conform to the environment, influencing them as well as the world around them. Subjective culture theory assigns social interaction, beliefs, roles, and attitudes as behavioral influencers (Triandis & Malpass, 1970). As with social cognitive theory, these behavioral influencers differ in their impact on behavior choices based on differences in demographic variables as well.

The face validity findings in this study demonstrated the familiarity that this population has with the language used to test STD knowledge. This familiarity may be attributed to what a student learns from peers, family, and social media, which make up a part of their social environment and can influence how and what is learned. Some face validity respondents also stated they were uncomfortable with the material in the questionnaire, and this could be attributed to cultural factors, roles and responsibilities, or social stigma of STDs. The CVR results can be indicative of what SMEs have learned in their respective disciplines and their impression of STDs can also be affected by their cultural exposure and beliefs.

Based on prior research using social variables along with demographic variables to examine STD knowledge (Anwar et al., 2010.; Rouner & Lindsay, 2006), the knowledge scores obtained in this study were assumed to be influenced by age, gender, and ethnicity from a social perspective. As mentioned above, demographic variables affect behaviors and learning, and this in turn is impacted socially by environment, social

roles, and society. Age was shown to impact differences in STD knowledge scores; however, no other sole demographic impact was shown. The findings in this study show STD knowledge level differences by age are a result of multiple social and cultural factors that influence demographics and are not individually explained. The connection between demographic and social factors and their impact on behavior relate to how social cognitive and subcultural theory is used in this study. These results indicate that demographics alone do not explain the variability in STD knowledge scores, how STD knowledge is learned, and how approaching the problem should be addressed.

Limitations of the Study

The limitations experienced in this study included use of a study population of only seventh graders and the sensitivity of items in the STD-KQ. Introduction of STD education is limited in seventh grade and more represented in eighth grade according to the SMEs used in this study. The impact of this limitation was minimal as the intent of the study was to support suggestions that STD education should occur earlier in hopes to reduce burden of disease among youth age 15 to 24. The use of participants from all over the United States supports the generalizability of the study to the larger population of seventh graders.

The sensitivity of the questions posed in the STD-KQ significantly limited the number of participants in the study. Over 800 participants were contacted, and although the minimum population was exceeded by approximately 15% (calculated size = ~170, actual n = 207), more participants may have provided a more robust study; however, this fact does not impact the results. The sensitivity of the material also limited the number of

school districts electing to permit the study to be conducted to two (Charlotte and Chapel Hill/Carrboro, NC) and only five middle schools collectively. Initially, there were over 25 school districts contacted for participation in the study of which approximately 23 declined. The fact that only five participants were from the middle schools may have had a positive impact on the study results. If more participants had been recruited from the middle schools, the study may not have been generalizable due to the sample not being representative of the larger population of 12 and 13 year olds, but being from a handful of middle schools in the southeast United States.

Measuring content validity of the STD-KQ among this population using eight SMEs determined that only six questions out of 27 met the minimum CVR value of 0.75 according to Lawshe (1975). Such a small number of questions on the survey meeting this requirement could yield uncertainty of its validity among this population. Increasing the number of SMEs may lead to more agreement of essential items and a lower CVR requirement, thus making the survey more valid.

Using Survey Monkey Audience as the primary provider of respondents may have introduced selection or sampling bias in this study. These respondents were limited to only those seventh graders with access to a computer and whose parent(s) is a member of Survey Monkey Audience. Although paper surveys were available and all middle school and community flyer recruits preferred the Internet questionnaire, no respondents used the mail in method. In addition, ensuring that Survey Monkey respondents were indeed middle school students, ages 12 or 13, was not possible due to the surveys being completed without direct researcher supervision.

Recommendations for Action

Recommendations for action as a result of this study are directed at introducing more STD information at earlier ages and potentially modifying SIECUS guidelines which group 12 year olds as both pre-adolescent (age 9 to 12) and early adolescent (age 12 to 15). According to SIECUS, pre-adolescents should be familiarized with STDs and early adolescents should have more information introduced along with symptoms and treatment. This study demonstrates that a considerable percentage (~31%) of participants scored low on the STD-KQ and over half scored moderately; which shows some familiarity but requires improvement if incidence rates of STDs other than HIV/AIDS are to decrease at any rate in the near future. Collaboration with school districts, parents, and health care providers is warranted in order to gain successful implementation of STD education at younger ages and reduce rates of STDs among young people.

School districts should modify STD information provided to 12 year olds to include symptoms, images, and treatment of STDs. Training should also be implemented for health education teachers and school nurses to ensure that proper STD information is relayed in an age appropriate manner that is interesting and retainable. Parents should be educated on the current STD incidence rates to help them recognize the need for increased educational instruction. Parent forums could be created by school districts where school nurses and health care providers present STD information to parents, allow for question and answer sessions, provide educational material on STDs, and teach parents how to discuss the topic with their child in an unthreatening manner. Health care providers can also not only help teach parents about STDs, but support the need publicly

for implementation of STD education at age 12, display youth oriented STD materials in their waiting rooms, and take the initiative to get parental consent to discuss STDs with their patients.

Several SMEs that participated in the content validity portion of this study voiced their discontent with the shift from health education to physical education in schools in New Jersey, and even suggested they would use the STD-KQ in their classes to gauge what their students know about STDs. Health education teachers and other school staff must be involved and educated on which deficiencies exist and how these deficiencies will impact the future of our youth as it pertains to their long-term health. With the growing obesity problem in the United States among children (CDC, 2014), the need for increased physical education is understood but cannot come at the expense of heath education. Federal government involvement is needed to extend the school day for middle and high school students on a national level so that both physical education and health education can be maintained as a priority. Even a minor increase of 30 minutes per day equates to an additional two and a half hours per week of instructional time. Given the fact that 50% of new STDs are represented by adolescents and young adults, the problem we are facing requires educating all stakeholders, not only those getting infected.

As mentioned above, stakeholders include school districts, parents, students, and health care providers. Educating these stakeholders includes not only implementing STD education at earlier ages in schools and the availability of educational materials in public locations, but the involvement of social media. Facebook, Twitter, and television commercials on youth directed channels can act as an outlet and help in disseminating the

message to a vast population. The data from this research indicate that less is known about chlamydia, gonorrhea, and HPV in this population and over 60% of respondents answered incorrectly to questions pertaining to these STDs. Moreover, incidence rates are the 2nd highest among 15 to 19 year old females and 3rd highest among 15 to 19 year old males for both chlamydia and gonorrhea (CDC, 2014a) and should be the an area of focus for educational changes. HPV is the most common STD; however, HPV incidence rates are declining among adolescents despite low rates of vaccination among both females and males. One area of education regarding HPV should include informing youth of the HPV vaccination option in hopes to keep HPV rates low in this population.

Recommendations for Future Research

Several recommendations can be made for future research as a result of this study. Despite a slightly higher than anticipated number of participants, future research using a higher number of participants could provide even more support in favor of an expanded STD educational curricula than this study and previous research studies. One recommendation is the possibility of government initiated studies on STD knowledge among this population, similar to the CDC's Youth Risk Behavior Surveillance Survey (YRBSS), that could be developed and administered, and may foster more support and participation than an academic based study. This type of study could also include the development and validation of a new survey directed toward this population specifically, or a modification of the STD-KQ to make it more befitting of early adolescence.

Additionally, social, socioeconomic, and demographic variables must be explored together to truly determine if these variables have any impact on STD knowledge scores.

Several ideas include examining STD scores among different groups by individual factors such as family income level, household make-up, geographic location, age at sexual debut, religion, parental communication, and parent education levels. External factors such as peer group influences, amount of current sex education being taught, amount of social support available, access to health care, and social norms (how we should behave) could provide the foundation for future research questions when coupled with demographic factors and may provide a much clearer picture. This is only a fraction of the possible internal and external factors that can be examined together with STD knowledge score

Implications for Social Change

Positive health outcomes for young America are the responsibility of all members of society. Studies like this and prior research highlight the need for collective action and direct us toward alternative ideas and potential solutions. Education can always be improved upon and once research has shown that a need exists, our job as scholar-practitioners is to push for such improvements. This study provides support that young adolescents lack sufficient knowledge about STDs other than HIV/AIDS and that the educational system in the United States requires modifications to fill in the gap. Social change must include enhancements to school health curricula and the provision of comprehensive information on chlamydia, gonorrhea, HPV, herpes, and even hepatitis B to students younger than seventh grade.

During the process of recruiting school districts to allow for conduct of the study, I found that most districts placed the responsibility of educating this population onto

others (parents, school nurses, etc.) or felt that the population was too young for such sensitive materials to be introduced. At the same time, SIECUS guidelines say something different, while our youth suffer with increased incidence rates of STDs (CDC, 2012a; National Guidelines Taskforce, 1991). Teachers, politicians, doctors, nurses, principals, parents, and researchers have to redirect their thinking away from students being "too young" for sensitive information. They have to lean towards what studies have shown – there is definitely a lack of knowledge. This research has also shown that both the majority and the minority lack sufficient STD knowledge. Social change has to be geared toward all pre-adolescents, regardless of their gender and ethnicity; however, additional modifications may be needed for specific risk groups based on social factors.

As a nation, we must stop passing our responsibility onto others. Each stakeholder has a responsibility; parents have to be open to communicating with their children and willing to discuss what may make them uncomfortable, or at least give the schools permission to relay the sensitive messages. Schools have to ignite parents by engaging them in sensitive dialogue and working with them to educate their children on health dangers. Local and federal governments must provide incentives to communities (additional funding, tax breaks, etc.) who actively provide resources to their members and families. Community resources include STD screening clinics, condom distribution, birth control, and youth outreach classes (geared to educate young people and provide them a forum to ask questions outside of the classroom). These resources should be made readily available to community members at convenient times and locations, and include participation of community doctors and healthcare staff. It is these types of collaborative

efforts that will lead to social change and lower STD rates among our young people in the United States.

Conclusion

STD knowledge among early adolescents has been a lightly researched phenomenon that has had a primary focus on behavioral factors such as age of sexual debut and number of sexual partners. Knowledge has also been based mostly on HIV/AIDS and less frequently on other STDs that pose more of a risk to our youth. Prior research has indicated that behavioral and demographic factors do influence STD knowledge; however, much of this research was performed among older age adolescents (mean ages 16 to 17) rather than at early adolescence. Several researchers agree that we must begin to educate youth on STDs at younger ages in hopes to provide them more positive health outcomes later on in adolescence and young adulthood (CDC, 2010).

This study used both social learning and cultural frameworks to examine if demographic variables affect and predict STD knowledge scores among seventh graders and only found that age plays a significant role in STD knowledge scores. It is clear that additional factors must be examined from both social and demographic realms as the phenomena of high rates of STDs other than HIV/AIDS among this population is multi-faceted and complex in nature and cannot be explained by individual variables alone.

Collaborative efforts must take place to improve upon educational curricula available to our youth in order to achieve lower rates of disease and healthier lives as young adults. More research is also needed to support these efforts and provide a backdrop for change, including research that can reach greater numbers of youth and

garner the support of communities, parents, schools, and health care providers. Sexual health education, especially educating our youth about STDs other than HIV/AIDS must begin earlier than middle school and must include more than a mere mention of what an STD is and how it is contracted. Lessons in STD education should make a significant impact, using images and interactive games along with other educational tools to captivate and engage pre-adolescents and seek to change negative behaviors in the future.

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Appendix A: STD-KQ

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

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

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

Scoring for the STD Knowledge Questionnaire:

Score 1 for each correct response.

False is the correct response for these items:
1, 2, 5, 7, 10, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26.

True is the correct response for the remaining items:
3, 4, 6, 8, 9, 12, 14, 27.

Total scores range from 0—27.

If you use this scale, please cite:

Jaworski, B. C., & Carey, M. P. (2007). Development and Psychometric Evaluation of a Self-administered Questionnaire to Measure Knowledge of Sexually Transmitted Diseases. *AIDS and Behavior*, 11, 557-574.

Text Readability Consensus Calculator

Purpose: Our Text Readability Consensus Calculator uses 7 popular readability formulas to calculate the average grade level, reading age, and text difficult of your sample text.

Your Results:

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

Flesch Reading Ease score: 70.6 (text scale)
Flesch Reading Ease scored your text: fairly easy to read.
[f] | [a] | [r]

Gunning Fog: 4.9 (text scale)
Gunning Fog scored your text: easy to read.
[f] | [a] | [r]

Flesch-Kincaid Grade Level: 5.2
Grade level: Fifth Grade.
[f] | [a] | [r]

The Coleman-Liau Index: 7
Grade level: Seventh Grade
[f] | [a] | [r]

The SMOG Index: 5.8
Grade level: Sixth Grade
[f] | [a] | [r]

Automated Readability Index: 1.6
Grade level: 6-8 yrs. old (First and Second graders)
[f] | [a] | [r]

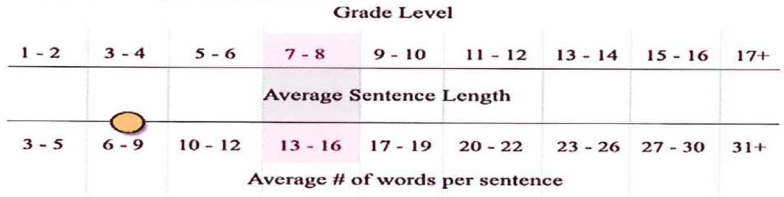
Linsear Write Formula : 3.4
Grade level: Third Grade.
[f] | [a] | [r]

Readability Consensus

Based on 8 readability formulas, we have scored your text:
Grade Level: 5
Reading Level: fairly easy to read.
Reader's Age: 8-9 yrs. old (Fourth and Fifth graders)

Show Word Statistics

Show Graph Statistics

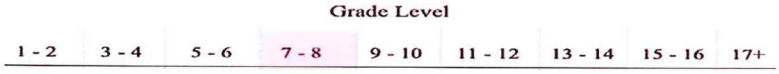


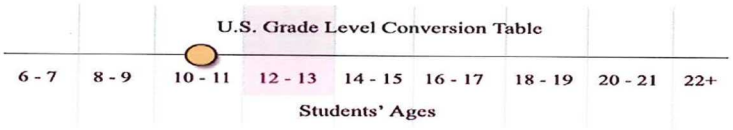
(Green color) = Name of graph

(Pink color) = U.S. average grade level.

= Your text

The average sentence length for U.S. high school and adult readers is between 13-16 words. Your average sentence length is 7.



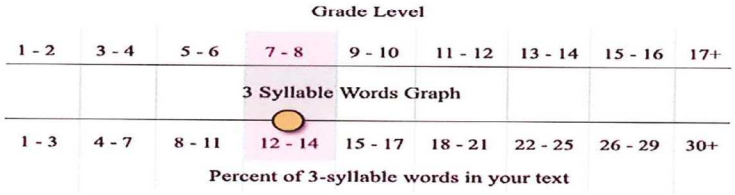


(Green color) = Name of graph

(Pink color) = U.S. average grade level.

= Your text

The average reading level for U.S. high school and adult readers is between 7th and 8th grade. Your text's grade level is 5.



(Green color) = Name of graph

(Pink color) = U.S. average grade level.

= Your text

The average percent of 3-syllable words for U.S. high school and adult readers is between 12-14%. The percent of 3-syllable words in your text is 13%.

Appendix B: Parental Consent Form

PARENT CONSENT FORM FOR RESEARCH

Your child is invited to take part in a research study of how much he or she knows about sexually transmitted diseases (STDs) other than HIV/AIDS. The researcher is inviting all 7th grade students attending your child's school to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to allow your child to take part.

This study is being conducted by a researcher named Racquel Weaver, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to collect information about what children know about STDs other than HIV/AIDS in order to hopefully improve sexual education courses in public schools and reduce rates of disease in teenage youth. Most prior research on STD knowledge has been conducted among adolescents, and young adults. Administering this survey to children younger than what has been previously performed will help determine what this age group may know about STDs. In addition, it will support the fact that more research is needed among younger children, seek to educate them on protective health measures that will benefit them during adolescence, and increase their knowledge about negative behaviors that will lead to poor health outcomes in the future.

Procedures:
If you agree to allow your child to be in this study, your child will be asked to:

- Complete a 27–question survey that will take 20-30 minutes to complete either by mail (if they have no access to a computer) or via the Internet.
    - Answer all questions and when done, put the completed survey and informed consent/assents in the self-addressed, pre-paid envelope and mail back to the researcher.
    - If your child is completing the survey via the Internet, he/she should click the "Submit" button once the survey is completed and mail back the informed consent/assent to the researcher in the envelope provided. Please include your child's Internet survey identification number (eg. INT-000) on the signed informed consent/assent prior to returning.
    - Keep a copy of this consent for his/her records if he/she would like.

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision of whether or not you want your child to be in the study. Of course, your child's decision is also an important factor. No one at your child's school will know if your child decides to participate or not in the study. If you decide to consent now, you or your child can still change your mind later. Any children who feel stressed during the study may stop at any time. Your child may skip any questions that he/she feels make them uncomfortable.

Risks and Benefits of Being in the Study:
There are no known risks connected to this study. The survey does contain sensitive material regarding STDs, however, no questions regarding personal sexual behaviors or experiences will be asked. Results from this study may help your child and other young people because they will help us and the school officials design better programs about sex and sexual health.

Payment:
Your child will receive a $10 Visa Gift Card for their participation in this research.

Privacy:
Any information your child provides will be kept confidential. The researcher will not use your child's information for any purposes outside of this research project. Also, the researcher will not include your child's name or anything else that could identify your child in any reports of the study. Data will be kept secure using a password protected electronic file. Any written information about your child will be kept in a locked water and fireproof cabinet with access available to only the researcher. Personal data will be destroyed once each participant receives his/her $10 Visa Gift Card and de-identified data will be kept for a period of 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone at or email at. If you want to talk privately about your child's rights as a participant, you can call XXX. XXX is the Walden University staff member who can discuss this with you. XXX's phone number is XXX-XXX-XXXX. Walden University's approval number for this study is # 12-11-13-0119109 and it expires on October 27, 2015.

The researcher will provide an extra copy of this form for you to keep.

Statement of Consent:
I have read the above information and I feel I understand the study well enough to make a decision about my child's involvement in this optional research project. By signing below I understand that I am agreeing to the terms described above.

Printed Name of Parent

_____

Printed Name of Child

_____

Date of consent

_____

Parent's Signature

_____

Researcher Signature

_____

Please mail this completed form, the form completed by your child, and the completed survey if completing a paper version to:

Racquel Weaver

Appendix C: Child's Assent Form

ASSENT FORM FOR RESEARCH

Hello, my name is Racquel Weaver and I am doing a research project to learn what you know about diseases spread through sex. I am inviting you to join my project. I am inviting all 7th grade students in your school to be in the study. A leaflet was provided to you and your parent(s) because I want you to learn about the project before you decide if you want to be in it.

WHO I AM:
I am a student at Walden University. I am working on my doctoral degree.

ABOUT THE PROJECT:
If you agree to be in this project, you will be asked to:

- Complete a 27–question survey that will take 20-30 minutes
  - Answer all questions and when done, put the completed survey in an envelope and follow the directions if you do not have a computer or submit the survey on the Internet if you do have a computer.
  - Keep a copy of this consent
  - Receive a $10 Visa Gift Card for your completed survey

IT'S YOUR CHOICE:
You don't have to be in this project if you don't want to. If you decide now that you want to join the project, you can still change your mind later. If you want to stop, you can. This survey will ask questions related to sexually transmitted diseases and are considered sensitive. Again, if you feel uncomfortable at any time answering these types of questions, you can stop at any time. At no time will the questions asked be related to your sexual experiences or behaviors, past or present.

Results from this study may help you and other young people like you because they will help other researchers and public schools make better programs to help you learn about sex and sexual diseases.

PRIVACY:
Everything you tell me during this project will be kept private. That means that no one else will know your name or what answers you gave.

ASKING QUESTIONS:

You can ask me any questions you want now. If you think of a question later, you or your parents can reach me at or email me at. If you or your parents would like to ask my university a question, you can call XXX. XXX's phone number is XXX-XXX-XXXX.

I will give you a copy of this form.
Please sign your name below if you want to join this project.

Name of Child

_____

Child Signature

_____

Date

_____

Researcher Signature

_____

Please mail this completed form, the form completed by your parent(s), and the completed survey if completing a paper version to:

Racquel Weaver

Appendix D: Research Study Information Leaflet

Research Study Information Leaflet

You are invited to take part in a short survey about certain diseases that are spread through sex or sexually transmitted diseases (STDs).

This leaflet explains why the research is being done and what would be involved if you choose to take part. Please feel free to discuss this study and ask us if there is anything that is not clear or if you need further information.

What is the purpose of the study?

STDs are a growing problem among young people, especially among teenagers a little older than you. This study will try to find out what kids your age know about STDs and help researchers to figure if schools need to teach you more about the dangers of STDs.

Why have I been chosen?

You have been chosen because you are at an age where you can learn more about STDs and use the information you learn to make better decisions about your health in the future.

Do I have to take part?

No, you do not have to take part. Participation is entirely up to you and whether you participate or not will not affect you in any way. If you decide not to take part, I will not contact you again.

What will happen to me if I take part?

If you agree to take part, (1) you will need to write your name and address and check the boxes below, (2) have your parent(s) check the box giving you permission to receive the informed consent forms (3) return this leaflet to the researcher at the address provided below.

Will you be contacting me in the future?

Once I receive the returned leaflet with your information, I will mail you an informed consent form for both you and your parents to read and sign. Informed consent is your agreement to participate and your parent's permission for you to participate. It also confirms that you have been told about the study. The complete survey will also be included for your parent to review in advance of your participation.

What are the possible disadvantages and risks of taking part?

The questions deal with sensitive material but remember you do not have to answer anything you do not feel comfortable with. No one will know your answers because you will only be identified by a number and only the researcher will know that the number belongs to you.

What are the possible benefits of the study?

This may help us improve the way kids your age are taught about STDs.

What if something goes wrong?

This survey contains sensitive information that you may not be comfortable reading or answering questions about. There will be no questions that ask about your personal behavior and if you do not want to participate you do not have to. You can refuse at any time. Your information will only be seen by the researcher and will be destroyed once all surveys have been completed and your gift card has been mailed to you.

Will my taking part in this study be kept private?

Yes. All the information you answer in the survey will be treated in the strictest confidence. Only the researcher will know your personal details. No personal information will ever be made available to anyone outside the study and no individually identifiable information will be published. You can withdraw the information you give in this questionnaire upon request, up to the point at which data are analyzed and personal details removed.

What will happen to the results of the research study?

The results will be written up in a paper called a dissertation by the researcher for graduation from Walden University. The results of the study may be provided to your school district upon request and remember, no personal information about you or answers to survey questions you provided will be reported in the results.

What next?

We hope that you will join the research study and complete and return this leaflet. With your help we believe that we can make a significant contribution towards improving STD rates among teens in the future. If you decide to complete the survey, you will receive a $10 gift card once the completed survey is received.

Name: _____

Address: _____

_____

_____

_____

☐ I am interested in participating in this research study.

☐ My parent(s) have given me permission to receive the consent forms.

☐ Yes I have access to a computer.

☐ No I do not have access to a computer.

Please mail this form in the return envelope provided to:

Racquel Weaver

If there is anything that is not clear, or if you would like more information, please contact:

Name: Racquel Weaver

Appendix E: Parental Consent Form – Community Recruitment

PARENT CONSENT FORM FOR RESEARCH

Your child is invited to take part in a research study of how much he or she knows about sexually transmitted diseases (STDs) other than HIV/AIDS. The researcher is inviting only 7th grade students to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to allow your child to take part.

This study is being conducted by a researcher named Racquel Weaver, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to collect information about what children know about STDs other than HIV/AIDS in order to hopefully improve sexual education courses in public schools and reduce rates of disease in teenage youth. Most prior research on STD knowledge has been conducted among adolescents, and young adults. Administering this survey to children younger than what has been previously performed will help determine what this age group may know about STDs. In addition, it will support the fact that more research is needed among younger children, seek to educate them on protective health measures that will benefit them during adolescence, and increase their knowledge about negative behaviors that will lead to poor health outcomes in the future.

Procedures:
If you agree to allow your child to be in this study, your child will be asked to:

- Complete a 27–question survey that will take 20-30 minutes to complete either by mail (if they have no access to a computer) or via the Internet.
    - Answer all questions and when done, put the completed survey and informed consent/assents in the self-addressed, pre-paid envelope and mail back to the researcher..
    - If your child is completing the survey via the Internet, he/she should click the "Submit" button once the survey is completed and mail back the informed consent/assent to the researcher in the envelope provided. Please include your child's Internet survey identification number (eg. INT-000) on the signed informed consent/assent prior to returning.
    - Keep a copy of this consent for his/her records if he/she would like.

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision of whether or not you want your child to be in the study. Of course, your child's decision is also an important factor. No one other than you will know if your child decides to participate or not in the study. If you decide to consent now, you or your child can still change your mind later. Any children who feel stressed during the study may stop at any time. Your child may skip any questions that he/she feels make them uncomfortable.

Risks and Benefits of Being in the Study:
There are no known risks connected to this study. The survey does contain sensitive material regarding STDs, however, no questions regarding personal sexual behaviors or experiences will be asked. Results from this study may help your child and other young people because they will help us and school officials design better programs about sex and sexual health.

Payment:
Your child will receive a $10 Visa Gift Card for their participation in this research.

Privacy:
Any information your child provides will be kept confidential. The researcher will not use your child's information for any purposes outside of this research project. Also, the researcher will not include your child's name or anything else that could identify your child in any reports of the study. Data will be kept secure using a password protected electronic file. Any written information about your child will be kept in a locked water and fireproof cabinet with access available to only the researcher. Personal data will be destroyed once each participant receives his/her $10 Visa Gift Card and de-identified data will be kept for a period of 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone at or email at If you want to talk privately about your child's rights as a participant, you can call XXX. XXX is the Walden University staff member who can discuss this with you. XXX's phone number is XXX-XXX-XXXX. Walden University's approval number for this study is # 12-11-13-0119109 and it expires on October 27, 2015.

The researcher will provide an extra copy of this form for you to keep.

Statement of Consent:
I have read the above information and I feel I understand the study well enough to make a decision about my child's involvement in this optional research project. By signing below I understand that I am agreeing to the terms described above.

Printed Name of Parent

_____

Printed Name of Child

_____

Date of consent

_____

Parent's Signature

_____

Researcher Signature

_____

Please mail this completed form, the form completed by your child, and the completed survey if completing a paper version to:

Racquel Weaver

Appendix F: Child's Assent Form – Community Recruitment

ASSENT FORM FOR RESEARCH

Hello, my name is Racquel Weaver and I am doing a research project to learn what you know about diseases spread through sex. I am inviting you to join my project. I am inviting only 7th grade students to be in the study. A leaflet was provided to you and your parent(s) because I want you to learn about the project before you decide if you want to be in it.

WHO I AM:
I am a student at Walden University. I am working on my doctoral degree.

ABOUT THE PROJECT:
If you agree to be in this project, you will be asked to:

- Complete a 27–question survey that will take 20-30 minutes
  - Answer all questions and when done, put the completed survey in an envelope and follow the directions if you do not have a computer or submit the survey on the Internet if you do have a computer.
  - Keep a copy of this consent
  - Receive a $10 Visa Gift Card for your completed survey

IT'S YOUR CHOICE:
You don't have to be in this project if you don't want to. If you decide now that you want to join the project, you can still change your mind later. If you want to stop, you can. This survey will ask questions related to sexually transmitted diseases and are considered sensitive. Again, if you feel uncomfortable at any time answering these types of questions, you can stop at any time. At no time will the questions asked be related to your sexual experiences or behaviors, past or present.

Results from this study may help you and other young people like you because they will help other researchers and public schools make better programs to help you learn about sex and sexual diseases.

PRIVACY:
Everything you tell me during this project will be kept private. That means that no one else will know your name or what answers you gave.

ASKING QUESTIONS:
You can ask me any questions you want now. If you think of a question later, you or your parents can reach me at XXX or email me at XXX @waldenu.edu. If you or your

parents would like to ask my university a question, you can call XXX. XXX's phone number is XXX-XXX-XXXX.

I will give you a copy of this form.
Please sign your name below if you want to join this project.

Name of Child

_____

Child Signature

_____

Date

_____

Researcher Signature

_____

Please mail this completed form, the form completed by your parent(s), and the completed survey if completing a paper version to:

Racquel Weaver

Appendix G: Parental Consent and Child Assent– Survey Monkey Audience

PARENT CONSENT FORM FOR RESEARCH

Your child is invited to take part in a research study of how much he or she knows about sexually transmitted diseases (STDs) other than HIV/AIDS. The researcher is inviting only 7th grade students to be in the study. A researcher named Racquel Weaver, who is a doctoral student at Walden University, is conducting this study.

Your child's participation in this research study is voluntary. You may choose not to let him/her participate. If you decide to let him/her participate in this research survey, they may withdraw at any time. If you decide not to allow your child to participate in this study, or, if they withdraw from participating (at any time), they will not be penalized.

The study involves filling an online survey that will take approximately 30 minutes. Their responses will be confidential and no identifying information such as their name or email address will be collected. The survey questions will be about how much your child knows about sexually transmitted diseases (STDs) other than HIV/AIDS. There will be no personal questions regarding sexual activity or experiences, only about what they know with regard to STDs, treatment, and symptoms.

We will do our best to keep your child's information confidential. All data is stored in a password protected electronic format. To help protect their confidentiality, the surveys will not contain information that will personally identify them. The results of this study will be used for scholarly purposes only and may be shared with Walden University representatives.

If you have any questions about the research study, please contact the researcher via phone at XXX-XXX-XXXX or email at XXX@waldenu.edu. If you want to talk privately about your child's rights as a participant, you can call XXX. XXX is the Walden University staff member who can discuss this with you. XXX's phone number is XXX-XXX-XXXX. This research has been reviewed according to Walden University IRB procedures for research involving human subjects.

ELECTRONIC CONSENT: Clicking on the "agree" button below indicates that:

• You have read the above information

• You voluntarily allow your child to participate

○ Agree

ASSENT FORM FOR RESEARCH

This survey is part of a research project to learn what you know about diseases spread through sex.

The person collecting this survey information is a student at Walden University working on a doctoral degree. Her name is Racquel Weaver.

If you agree to be in this project, you will be asked to complete the following survey that will take about 20-30 minutes.

You don't have to take this survey if you don't want to. If you decide now that you want to take the survey, you can still change your mind later. If you want to stop, you can. This survey will ask questions related to sexually transmitted diseases and are considered sensitive. Again, if you feel uncomfortable at any time answering these types of questions, you can stop at any time. At no time will the questions asked be related to your sexual experiences or behaviors, past or present.

All of your answers to the survey questions will be kept private. That means that no one else will know your name or what answers you gave.

If you have questions about this study, you or your parents can reach Racquel Weaver at XXX-XXX-XXXX or email her at XXX@waldenu.edu. If you or your parents would like to ask her university a question, you can call XXX. Her phone number is XXX-XXX-XXXX.

ELECTRONIC CONSENT: Clicking on the "agree" button below indicates that:

• You have read the above information

• You voluntarily agree to participate

◯ Agree

Appendix H: Flyer – Community Recruitment

Calling all Parents of 7th Graders: 7th Graders Needed to Complete a Survey!!!

Over 9 million new cases of sexually transmitted diseases (STD) are diagnosed each year in the Unites States among children and young adults age 15-24. It has also been found that approximately 20% of females age 14-19 will contract an STD within 1 year of onset of sexual activity and these STDs do not include HIV/AIDS!

This survey will try to find out what your 7th grader knows about STDs – symptoms, how they are spread, and if there is a cure.

No questions about your child's personal experiences will be asked and their information and answers will be kept confidential. The survey will only take 20-30 min to complete.

A $10 Visa Gift Card will be given to all participants

This research is being conducted to complete a PhD requirement.

- Please contact Racquel Weaver via phone or email if you would like your child to be a part of this study.
- Phone: XXX-XXX-XXXX
- Email: XXX@waldenu.edu

Appendix I: Interitem Correlation Matrix – All STD-KQ Items Except HIV

Inter-Item Correlation Matrix

	Q2. Frequent urinary infection can cause Chlamydia	Q3. There is a cure for Gonorrhea	Q6. Having anal sex increases a person's risk of getting Hepatitis B	Q8. There is a cure for Chlamydia	Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	Q10. A woman can look at her body and tell if she has Gonorrhea	Q11. The same virus causes all of the Sexually Transmitted Diseases	Q12. Human Papilloma Virus (HPV) can cause Genital Warts
Q2. Frequent urinary infection can cause Chlamydia	1.000	.218	.218	.218	-.200	.408	.218	.408
Q3. There is a cure for Gonorrhea	.218	1.000	.048	1.000	.218	.089	.429	.089
Q6. Having anal sex increases a person's risk of getting Hepatitis B	.218	.048	1.000	.048	.218	-.356	-.048	.089
Q8. There is a cure for Chlamydia	.218	1.000	.048	1.000	.218	.089	.429	.089
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	-.200	.218	.218	.218	1.000	.000	.218	-.408
Q10. A woman can look at her body and tell if she has Gonorrhea	.408	.089	-.356	.089	.000	1.000	-.089	.583
Q11. The same virus causes all of the Sexually Transmitted Diseases	.218	.429	-.048	.429	.218	-.089	1.000	-.089
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.408	.089	.089	.089	-.408	.583	-.089	1.000
Q14. Human Papillom Virus (HPV) can lead to cancer in women	-.200	.655	-.218	.655	.200	.408	.218	.408

Inter-Item Correlation Matrix

	Q14. Human Papillom Virus (HPV) can lead to cancer in women	Q15. A man must have vaginal sex to get Genital Warts	Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	Q19. There is a vaccine available to prevent a person from getting Gonorrhea	Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	Q22. There is a vaccine that prevents a person from getting Chlamydia
Q2. Frequent urinary infection can cause Chlamydia	-.200	1.000	.408	.500	1.000	-.408	.218	.600
Q3. There is a cure for Gonorrhea	.655	.218	-.089	.218	.218	-.089	-.429	.218
Q6. Having anal sex increases a person's risk of getting Hepatitis B	-.218	.218	-.089	.218	.218	-.089	.048	.218
Q8. There is a cure for Chlamydia	.655	.218	-.089	.218	.218	-.089	-.429	.218
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	.200	-.200	.000	.000	-.200	.000	-.218	-.200
Q10. A woman can look at her body and tell if she has Gonorrhea	.408	.408	.250	.408	.408	.250	.089	.408
Q11. The same virus causes all of the Sexually Transmitted Diseases	.218	.218	.535	-.218	.218	.089	-.048	.218
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.408	.408	.250	.408	.408	.250	.535	.816
Q14. Human Papillom Virus (HPV) can lead to cancer in women	1.000	-.200	.000	.000	-.200	.408	-.218	.200

Inter-Item Correlation Matrix

	Q23. A man can tell by the way his body feels if he has Hepatitis B	Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	Q27. There is a vaccine that can protect a person from getting Hepatitis B
Q2. Frequent urinary infection can cause Chlamydia	.200	.655	.600	.600
Q3. There is a cure for Gonorrhea	.218	-.048	.655	-.218
Q6. Having anal sex increases a person's risk of getting Hepatitis B	-.218	-.048	-.218	.218
Q8. There is a cure for Chlamydia	.218	-.048	.655	-.218
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	-.200	-.218	.200	-.200
Q10. A woman can look at her body and tell if she has Gonorrhea	.816	.802	.408	.408
Q11. The same virus causes all of the Sexually Transmitted Diseases	-.218	.048	.218	-.218
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.816	.802	.000	.408
Q14. Human Papillom Virus (HPV) can lead to cancer in women	.600	.218	.200	-.200

Inter-Item Correlation Matrix

	Q2. Frequent urinary infection can cause Chlamydia	Q3. There is a cure for Gonorrhea	Q6. Having anal sex increases a person's risk of getting Hepatitis B	Q8. There is a cure for Chlamydia	Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	Q10. A woman can look at her body and tell if she has Gonorrhea	Q11. The same virus causes all of the Sexually Transmitted Diseases	Q12. Human Papilloma Virus (HPV) can cause Genital Warts
Q15. A man must have vaginal sex to get Genital Warts	1.000	.218	.218	.218	-.200	.408	.218	.408
Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	.408	-.089	-.089	-.089	.000	.250	.535	.250
Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	.500	.218	.218	.218	.000	.408	-.218	.408
Q19. There is a vaccine available to prevent a person from getting Gonorrhea	1.000	.218	.218	.218	-.200	.408	.218	.408
Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	-.408	-.089	-.089	-.089	.000	.250	.089	.250
Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	.218	-.429	.048	-.429	-.218	.089	-.048	.535
Q22. There is a vaccine that prevents a person from getting Chlamydia	.600	.218	.218	.218	-.200	.408	.218	.816

Inter-Item Correlation Matrix

	Q14. Human Papillom Virus (HPV) can lead to cancer in women	Q15. A man must have vaginal sex to get Genital Warts	Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	Q19. There is a vaccine available to prevent a person from getting Gonorrhea	Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	Q22. There is a vaccine that prevents a person from getting Chlamydia
Q15. A man must have vaginal sex to get Genital Warts	-.200	1.000	.408	.500	1.000	-.408	.218	.600
Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	.000	.408	1.000	-.408	.408	-.250	.356	.408
Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	.000	.500	-.408	1.000	.500	.102	.218	.500
Q19. There is a vaccine available to prevent a person from getting Gonorrhea	-.200	1.000	.408	.500	1.000	-.408	.218	.600
Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	.408	-.408	-.250	.102	-.408	1.000	-.089	.000
Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	-.218	.218	.356	.218	.218	-.089	1.000	.655
Q22. There is a vaccine that prevents a person from getting Chlamydia	.200	.600	.408	.500	.600	.000	.655	1.000

Inter-Item Correlation Matrix

	Q23. A man can tell by the way his body feels if he has Hepatitis B	Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	Q27. There is a vaccine that can protect a person from getting Hepatitis B
Q15. A man must have vaginal sex to get Genital Warts	.200	.655	.600	.600
Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	.000	.535	.000	.000
Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	.500	.327	.500	.500
Q19. There is a vaccine available to prevent a person from getting Gonorrhea	.200	.655	.600	.600
Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	.408	.089	-.408	.000
Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	.218	.429	-.218	.218
Q22. There is a vaccine that prevents a person from getting Chlamydia	.600	.655	.200	.200

Inter-Item Correlation Matrix

	Q2. Frequent urinary infection can cause Chlamydia	Q3. There is a cure for Gonorrhea	Q6. Having anal sex increases a person's risk of getting Hepatitis B	Q8. There is a cure for Chlamydia	Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	Q10. A woman can look at her body and tell if she has Gonorrhea	Q11. The same virus causes all of the Sexually Transmitted Diseases	Q12. Human Papilloma Virus (HPV) can cause Genital Warts
Q23. A man can tell by the way his body feels if he has Hepatitis B	.200	.218	-.218	.218	-.200	.816	-.218	.816
Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	.655	-.048	-.048	-.048	-.218	.802	.048	.802
Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	.600	.655	-.218	.655	.200	.408	.218	.000
Q27. There is a vaccine that can protect a person from getting Hepatitis B	.600	-.218	.218	-.218	-.200	.408	-.218	.408

Inter-Item Correlation Matrix

	Q14. Human Papillom Virus (HPV) can lead to cancer in women	Q15. A man must have vaginal sex to get Genital Warts	Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	Q19. There is a vaccine available to prevent a person from getting Gonorrhea	Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	Q22. There is a vaccine that prevents a person from getting Chlamydia
Q23. A man can tell by the way his body feels if he has Hepatitis B	.600	.200	.000	.500	.200	.408	.218	.600
Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	.218	.655	.535	.327	.655	.089	.429	.655
Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	.200	.600	.000	.500	.600	-.408	-.218	.200
Q27. There is a vaccine that can protect a person from getting Hepatitis B	-.200	.600	.000	.500	.600	.000	.218	.200

Inter-Item Correlation Matrix

	Q23. A man can tell by the way his body feels if he has Hepatitis B	Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	Q27. There is a vaccine that can protect a person from getting Hepatitis B
Q23. A man can tell by the way his body feels if he has Hepatitis B	1.000	.655	.200	.200
Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again	.655	1.000	.218	.655
Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	.200	.218	1.000	.200
Q27. There is a vaccine that can protect a person from getting Hepatitis B	.200	.655	.200	1.000

Reliability Statistics (n=196)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.844*	.844	20

* Outliers removed

Inter-Item Correlation Matrix

	Q2. Frequent urinary infection can cause Chlamydia	Q3. There is a cure for Gonorrhea	Q6. Having anal sex increases a person's risk of getting Hepatitis B	Q8. There is a cure for Chlamydia	Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	Q10. A woman can look at her body and tell if she has Gonorrhea
Q2. Frequent urinary infection can cause Chlamydia	1.000	.094	-.024	.185	-.005	.246
Q3. There is a cure for Gonorrhea	.094	1.000	-.016	.382	.234	.250
Q6. Having anal sex increases a person's risk of getting Hepatitis B	-.024	-.016	1.000	.110	.062	.021
Q8. There is a cure for Chlamydia	.185	.382	.110	1.000	.224	.223
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	-.005	.234	.062	.224	1.000	.269
Q10. A woman can look at her body and tell if she has Gonorrhea	.246	.250	.021	.223	.269	1.000
Q11. The same virus causes all of the Sexually Transmitted Diseases	.247	.049	-.041	.265	.194	.229
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.157	-.067	.243	.124	.131	.174
Q14. Human Papillom Virus (HPV) can lead to cancer in women	.129	.226	.117	.305	.134	.285
Q15. A man must have vaginal sex to get Genital Warts	.304	.095	.024	.218	.187	.337

Inter-Item Correlation Matrix

	Q11. The same virus causes all of the Sexually Transmitted Diseases	Q12. Human Papilloma Virus (HPV) can cause Genital Warts	Q14. Human Papillom Virus (HPV) can lead to cancer in women	Q15. A man must have vaginal sex to get Genital Warts	Q16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women	Q17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina
Q2. Frequent urinary infection can cause Chlamydia	.247	.157	.129	.304	.183	.208
Q3. There is a cure for Gonorrhea	.049	-.067	.226	.095	.169	.072
Q6. Having anal sex increases a person's risk of getting Hepatitis B	-.041	.243	.117	.024	.010	-.014
Q8. There is a cure for Chlamydia	.265	.124	.305	.218	.053	.217
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	.194	.131	.134	.187	.045	.031
Q10. A woman can look at her body and tell if she has Gonorrhea	.229	.174	.285	.337	.154	.253
Q11. The same virus causes all of the Sexually Transmitted Diseases	1.000	.090	.215	.268	.212	.123
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.090	1.000	.332	.248	-.015	.189
Q14. Human Papillom Virus (HPV) can lead to cancer in women	.215	.332	1.000	.274	.116	.155
Q15. A man must have vaginal sex to get Genital Warts	.268	.248	.274	1.000	.132	.249

Inter-Item Correlation Matrix

	Q19. There is a vaccine available to prevent a person from getting Gonorrhea	Q20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease	Q21. A person who has Genital Herpes must have open sores to give the infection to his or her partner	Q22. There is a vaccine that prevents a person from getting Chlamydia	Q23. A man can tell by the way his body feels if he has Hepatitis B	Q24. If a person had Gonorrhea in the past, he or she is immune (protected) from getting it again
Q2. Frequent urinary infection can cause Chlamydia	.298	.204	.284	.264	.255	.306
Q3. There is a cure for Gonorrhea	.054	.138	.061	.120	.203	.122
Q6. Having anal sex increases a person's risk of getting Hepatitis B	.062	-.013	.068	.007	.014	-.047
Q8. There is a cure for Chlamydia	.058	.264	.133	.196	.302	.247
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	.117	.145	.093	.290	.237	.177
Q10. A woman can look at her body and tell if she has Gonorrhea	.331	.290	.298	.236	.393	.372
Q11. The same virus causes all of the Sexually Transmitted Diseases	.282	.266	.198	.229	.257	.458
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.051	.098	.044	.267	.214	.235
Q14. Human Papillom Virus (HPV) can lead to cancer in women	.169	.230	.162	.185	.325	.263
Q15. A man must have vaginal sex to get Genital Warts	.254	.191	.213	.187	.224	.434

Inter-Item Correlation Matrix

	Q26. A man can protect himself from getting Genital Warts by washing his genitals after sex	Q27. There is a vaccine that can protect a person from getting Hepatitis B
Q2. Frequent urinary infection can cause Chlamydia	.241	.203
Q3. There is a cure for Gonorrhea	.069	.095
Q6. Having anal sex increases a person's risk of getting Hepatitis B	.019	.224
Q8. There is a cure for Chlamydia	.148	.238
Q9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	.271	.127
Q10. A woman can look at her body and tell if she has Gonorrhea	.373	.123
Q11. The same virus causes all of the Sexually Transmitted Diseases	.331	.047
Q12. Human Papilloma Virus (HPV) can cause Genital Warts	.119	.229
Q14. Human Papillom Virus (HPV) can lead to cancer in women	.107	.215
Q15. A man must have vaginal sex to get Genital Warts	.362	.241

Reliability Statistics (n=207)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.823*	.823	20

*Outliers included