

## ABSTRACT

KNOWLEDGE OF SEXUALLY-TRANSMITTED INFECTIONS  
AND THE RELATIONSHIP TO SEXUAL BEHAVIORS  
IN YOUNG ADULT FEMALES

By Heather Mayer

Sexually-transmitted infections (STIs) continue to affect millions of Americans each year. If left untreated, STIs can cause long-term health effects, such as pelvic inflammatory disease (PID), infertility or even death. Sexually-transmitted infections are transmitted through unprotected sexual behavior.

Despite attempts to increase public knowledge on STIs, education has failed to change long-term risky sexual behavior, leaving young females at risk for STIs. In order for nurse practitioners to begin aiding in the educational process, it is important to gather baseline knowledge of what young adult females currently know about STIs.

The purpose of this non-experimental, descriptive, correlational study was to identify and describe the relationship between knowledge of STIs and sexual behavior among young adult females. Beck's (1974) Health Belief Model served as the theoretical framework for the study.

A non-probability convenience sample of young women was solicited from three family planning clinics in a Midwestern state. The Sexually-Transmitted Infections Survey was used to collect data regarding sexual behaviors and knowledge of STIs. Descriptive statistics, Pearson correlation coefficient, and independent *t*-tests were utilized to describe the following relationships among: (a) knowledge of STIs and sexual behavior; (b) having a history of an STI related to sexual behavior and knowledge of STIs; and (c) age at first intercourse related to sexual behavior, knowledge of STIs, and having a history of an STI.

Results indicated that participants who had more knowledge regarding STIs were less likely to engage in risky behaviors and less likely to have had a history of an STI, compared to those participants with less knowledge of STIs.

Participants who engaged in riskier sexual behavior were more likely to have a history of an STI, compared with those participants who did not engage in risk sexual behaviors. Participants who had intercourse at a younger age engaged in riskier sexual behaviors, had less knowledge of STIs, and were more likely to acquire an STI when compared to those young adult females who had sexual intercourse at a later age.

The ideal research design would be a longitudinal study focusing on a specific STI educational program and its impact on young females. It would also be helpful to study females at a younger age (14-18 years), since this is when females are becoming sexually active.

In order to change the rising numbers of STIs in young females, it is critical for nurse practitioners to take a more aggressive, active role in sexual health promotion and disease prevention. This includes routinely assessing the young female's sexual practices and providing education and resources needed to reduce their risk of acquiring an STI

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## CHAPTER I

### INTRODUCTION

Sexually-transmitted Infections (STIs), previously referred to as sexually-transmitted diseases (STDs), continue to be a threat to public health. The U.S. has the highest STI rates among the industrialized world (Trani, Gnisci, Nobile, & Angelillo, 2005). There are an estimated 19 million new cases reported annually; two-thirds of these cases are females (Center of Disease Control and Prevention [CDC], 2006). After a single incident of unprotected intercourse, females are twice as likely as men to acquire STIs, chlamydia, being the most common (Johnson-Mallard, Lemgacher, Kromrey, Campbell, Jevitt, Daley, & Schmitt, 2007). International surveillance data show that 70% of those with STIs are ages 15 to 24 years (Trani et al.). These current statistics are an under-representation of the true burden of STIs, since the majority of all cases are asymptomatic and, therefore, go undiagnosed. A major goal of *Healthy People 2010* is to eliminate health disparities affecting vulnerable groups, particularly those found with infectious diseases including HIV/AIDS and other STIs (Department of Health and Human Services [DHHS], 2007). Young adolescents are identified as a vulnerable group.

Ford, Jaccard, Millstein, Bardsley and Miller (2004) state that STIs can cause acute and long-term morbidity including: (a) pelvic inflammatory disease (PID), (b) infertility due to scarring of fallopian tubes, (c) ectopic pregnancy and pregnancy complications including: (a) fetal demise, (b) chronic pelvic pain, and (c) psychosocial issues. Chlamydia is associated with a higher incidence of cervical cancer and an increased risk of transmitting HIV (Ford et al., 2004).

Not only do STIs cause physical and psychological problems; they also have an economic impact. The U.S. alone spends more than \$14.1 billion each year directly related to STIs (CDC, 2007). Although researchers have made great advances in diagnosis and treatment of STIs, it is imperative to decrease the incidence of these diseases. Since many STIs are asymptomatic, many people are unaware that they are infected and continue to spread the infection from partner to partner. It is up to health care providers to stop the web of disease transmission.

The CDC developed objectives in *Healthy People 2010* with a goal of decreasing the incidence of STIs, specifically to decrease the proportion of adolescents with chlamydia, gonorrhea, and syphilis. Additional objectives are to increase education provided by primary care providers including prevention of STIs and condom use (*Healthy People 2010*, 2000).

Blair (2004) linked several behaviors to the transmission of STIs such as unprotected sexual intercourse, engaging in sexual intercourse under the influence of alcohol and drugs, having multiple sexual partners, and engaging in anal intercourse. Oral contraceptives are also linked to an increased risk of infection due to the changing of the vaginal pH to a more alkaline environment, favoring the growth of certain microorganisms. In addition, young females are at an increased risk for STIs due to biologic differences in cervical mucosa. Despite this current knowledge, few studies have investigated the correlation between sexual behavior and STI knowledge.

Johnson-Mallard et al. (2007) performed an experimental study to determine whether participating in an educational program has a positive effect on knowledge and perceived risks of STIs. The results showed that the intervention group had higher scores of perceived risk of STIs than the control group, indicating that education can

make a difference in perceived risk of STIs. However, these studies did not report a correlation between STI knowledge and sexual behavior, which is the focus of this study.

A qualitative study (Nguyen, Liamputtong, & Murphy, 2006) conducted in Vietnam found that many young adults receive most of their knowledge regarding condom use and STIs from educational institutions or family, which is described as inadequate. The researcher concluded that interventions to increase the accuracy of young adults' risk perceptions can influence sexual behaviors in a way that will reduce rates of chlamydia and gonorrhea.

Protective sexual behavior is reported as increasing and the incidence of STIs decreasing when adolescents receive STI counseling (Jemmott, 2007; Ross 2006). Smith (2006) reported conflicting results with nursing students who had a higher knowledge of HPV and cervical cancer, while engaging in riskier sexual behaviors such as unprotected sexual intercourse and having multiple sexual partners.

Wald, Langenberg, Krantz, Douglas, Handsfield, DiCarol, Adimora, Izu, Morrow and Corey (2005) conducted a study to determine if condom use decreases the incidence of herpes simplex virus (HSV). Results showed that those who used condoms more frequently were less likely to contract the HSV. These results indicate that condom use is an effective protective sexual behavior in decreasing the transmission of the HSV

#### Significance of Problem for Advanced Practice Nursing

Sexually-transmitted infections account for thousands of visits to primary care providers each year. Advanced practice nurse prescribers (APNPs) are responsible for educating young adults about safe sexual practices by providing accurate, current information. As continuity of care is established between the nurse practitioner and the

client, a level of trust is also established. When this rapport and trust are established, discussions about intimate topics such as sexual activity and safe sexual practices can occur. In some cases, the APNP may be the patient's only source of STI knowledge.

The understanding and prevention of STIs among young adults is a critical aspect in minimizing the risk of sexual infection transmission and reducing the frequency of STIs. Information on knowledge and behavior of sexual practices in young adults about the risk related to unprotected sexual intercourse is needed in order for nurse practitioners to establish a baseline as to where to begin education and incentive in spending extra time during office visits discussing this important topic.

In a Gallop Organization poll, over half of adults and one-third of adolescents said that their health care providers spent "no time at all" discussing STIs with them (Blair, 2004, p. 467). Another Kaiser Family Foundation Glamour survey found that OB/GYN providers rarely discuss or ask the appropriate screening questions for STIs (Blair et al.). There is a clear need for health care providers and educators to break the silence on sexual health and take the initiative in counseling, diagnosing and treating STIs, particularly in young females who are at highest risk.

#### Statement of the Problem

Sexually-transmitted infections continue as an increasing public health concern that affects millions of Americans each year. Little is known about the relationship of knowledge of STIs in relation to sexual behavior.

### Purpose of the Study

The purpose of this study is to identify and describe the relationships between knowledge of STIs, sexual behaviors, and history of having a STI in young adult females ages 18 to 24 years. A descriptive correlational design was used to ascertain whether or not young female adults are at risk for STIs in relation to their sexual behaviors, and to determine if a relationship exists between their knowledge of STIs and sexual behaviors.

### Research Questions

1. What is the relationship between knowledge of STIs and sexual behaviors in young adult females?
2. Is there a correlation between sexual behavior and having a history of an STI?
3. Is there a correlation between knowledge of STIs and having a history of a STI?
4. What is the relationship between age at first intercourse and sexual behavior, knowledge of STIs, and having a history of a STI?

### Definitions of Terms

#### *Conceptual Definitions*

*Risky sexual behavior:* Behaviors that place a person at an increased risk for acquiring a STI such as multiple sexual partners, history of a prior STI, engaging in anal sex and illegal intravenous drug use, and not using STI protection devices such as a condom, spermicidal jellies, or abstinence to prevent the spread of STIs during intimate

sexual contact between two or more persons including anal, oral, and vaginal intercourse (Schad, 1992).

*Knowledge of STIs:* General awareness or possession of information, facts, ideas, truths, or principles (*Encarta World English Dictionary, 2007*) related to any disease transmitted by sexual contact caused by microorganisms that survive on the skin or mucous membranes of the genital area; or transmitted via semen, vaginal secretions, or blood during intercourse.

*Sexually-transmitted infection:* An infection that can be transferred from one person to another through sexual contact. In this context, sexual contact is more than just sexual intercourse (vaginal and anal) and also includes kissing, oral-genital contact, and the use of sexual "toys," such as vibrators (*Encarta World English Dictionary, 2007*).

*Young adult females:* Youth females who have reached the age of legal majority (*Encarta World English Dictionary, 2007*).

*Age at first intercourse:* The age in years that a person was at the first time they had sexual intercourse: actual penetration of a penis into the vagina. (*Encarta World English Dictionary, 2007*).

#### *Operational Definitions*

*Risky sexual behavior:* Behaviors that increase one's risk of acquiring a STI will be measured by the Sexually Transmitted Infections survey (STIS).

*Knowledge of STIs:* Information concerning transmission and prevention of STIs will be measured by using the Sexually Transmitted Infections Survey (STIS).

*Young adult females:* For the purpose of this study, females between the ages 18 and 24 years, who are able to read and write English, from three family planning clinics in a Midwestern state.

### Assumptions

1. Health promotion is a benefit and is desirable.
2. Participants will answer the survey honestly and to the best of their knowledge.
3. Young female adults are sexually active and perceive STIs as a threat.
4. Young females have different levels of knowledge regarding STIs.

### Summary

With the increased incidence of STIs, the need for STI education is obvious.

This chapter presented an introduction to the problem of STIs and their potential influence on sexual behavior. An overview of the research problem, statement, purpose, implication, and conceptual and operational definitions were presented. Chapter II presents a more in-depth description of the conceptual framework, as well as a review of literature and research relevant to this study.

## CHAPTER II

### THEORETICAL FRAMEWORK AND LITERATURE REVIEW

#### Introduction

The purpose of this study was to determine if a relationship exists between knowledge of STIs and sexual behaviors among young adult females. The theoretical framework used for this study is Beck's Health Belief Model (HBM) (Becker, 1974). This chapter discusses the theoretical and conceptual framework for the research study. Along with the framework, this chapter also provides an extensive literature review of recent studies done on the knowledge of STIs and associated sexual behaviors.

#### Theoretical Framework

The HBM is a theoretical framework that is built on the belief that the world of the perceiver determines what he or she will do. The goal is to systematically explain and predict preventive health behavior. The HBM focuses on the relationships of health behaviors, why these behaviors occur, and how to identify possible change in behavior.

According to Becker (1974), disease prevention and treatment regimes depend on the patient's degree to which they believe it is a threat to them. In theory, the more one perceives something to be a threat, the more they are willing to participate in prevention and health promotion programs. The HBM consists of four main constructs:

(a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, and (d) perceived barriers (Becker) (Figure 1). In 1996, the HBM was expanded to include two more constructs: cues to action and self-efficacy.

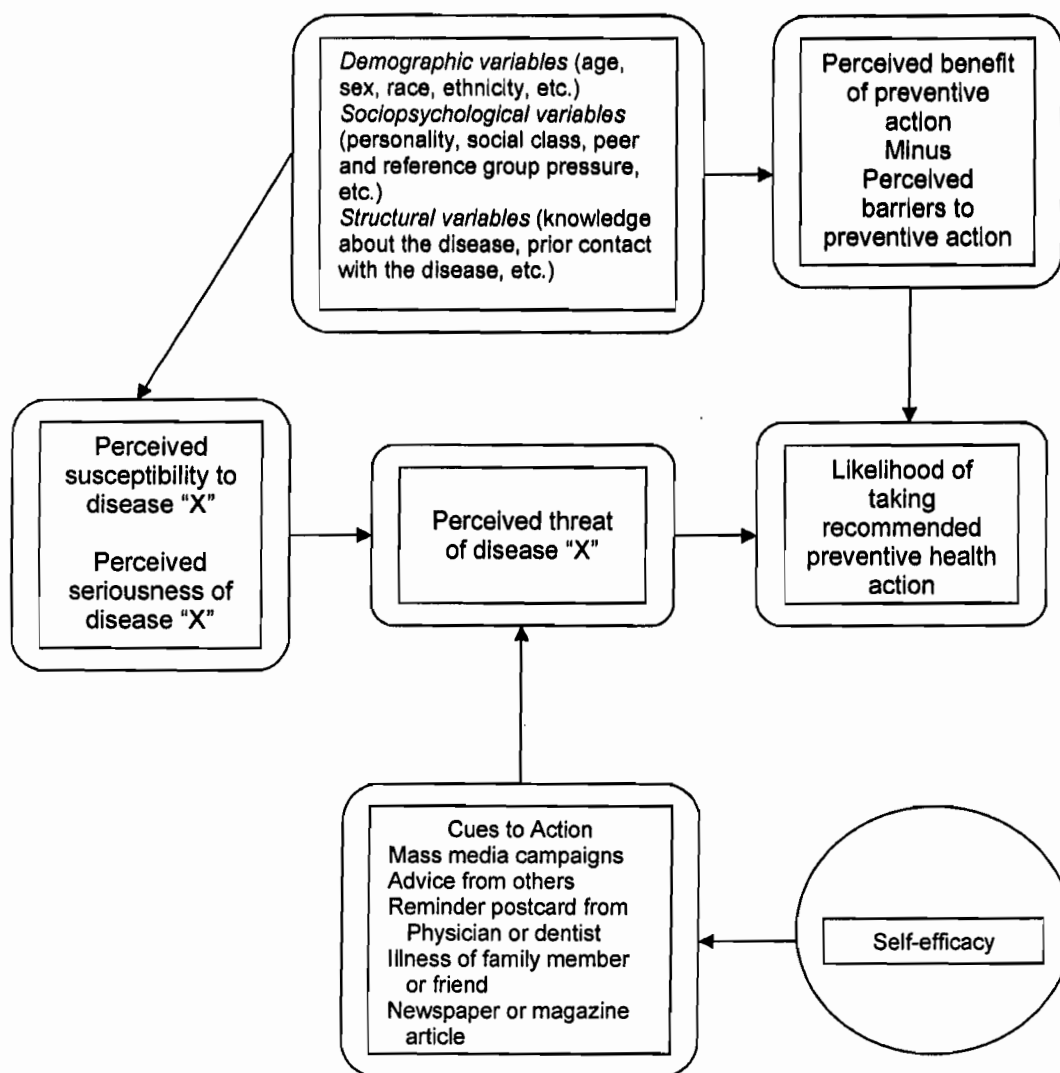


Figure 1. Beck's (1974) Health Belief Model.

The first construct, perceived susceptibility, is the degree in which a person believes he or she is susceptible to a disease or illness. For the purpose of this study, these are the views of young females becoming infected with an STI.

The second construct, perceived severity, is the belief that the disease or illness would have at least a moderately severe impact on some component of his or her life. For the purpose of this study, this is the perceived severity of an STI on the young female's life (i.e., physical, social, intimacy, psychological).

The third construct, perceived benefits, is the belief that certain behaviors could be beneficial in reducing his or her susceptibility or severity of the disease or illness. For the purpose of this study, these perceived behaviors could include condom use, a decrease in number of sexual partners, knowing the sexual history of one's partner, and having knowledge regarding the risk and prevention of STIs.

The fourth construct, perceived barriers, refers to the behaviors not being disrupted by other barriers. For the purpose of this study, barriers may include cost or availability of condoms, embarrassment to ask partner to use condom, or decreased sensation with condom use (Lin, Simoni, & Zemon, 2005).

Cues to actions are those internal or external factors that stimulate individuals to act, based on their perceptions. Cues are signals that suggest to the individual that he or she is at a health risk. For the purpose of this study, cues to action could be internal, such as self-perception of sexuality, or external such as an occurrence of an STI in an acquaintance or a magazine article on STIs.

Self-efficacy is defined as the level of confidence individuals have in their ability to act (Powers, Carstensen, Colón, Rickheim, & Bergenstal, 2006). For the purpose of this

study, self-efficacy is the confidence to engage in protective sexual behaviors in order to remain free of STIs.

In order for a people to take health-promoting actions, they must believe the disease is a significant threat to them. They must also believe the benefits of not becoming infected with the disease outweighs the barriers in preventing the disease (Beck, 1974). The following is a case study to demonstrate Beck's HBM.

A 19-year-old female receives STI counseling from her nurse practitioner during an annual physical exam prior to going to college. The knowledge that she gained from her nurse practitioner, made her realize how common STIs really are (perceived susceptibility). She recalls a friend that ended up in the hospital for antibiotic therapy for treatment of PID (perceived severity) secondary to chlamydia (cue to action). The young female does not like to use condoms because it "ruins the mood and decreases sexual sensation" (perceived barriers). However, after the knowledge she gained, she chooses to use condoms (self-efficacy) because contracting a STI would be far worse (perceived benefits) than the barriers to using a condom.

Although the HBM has been criticized by researchers for its subjectivity, literature indicates the HBM is helpful in predicting health-related behaviors (Jackson, Early, Myers-Schim, & Penprase., 2005; Lin et al., 2005; Menon, Champion, Monahan, Daggy, Hui, & Skinner, 2007; Neff & Crawford, 1998; Thato, Charron-Prochownik, Dorn, Albrecht, & Stone, 2003). The HBM fits this study well. Theoretically, if one believes STIs are a threat to their health, he or she will engage in protective sexual behavior to prevent STIs.

### Literature Review

This section includes a review of literature on STIs, knowledge of STIs, and sexual behaviors. There has been a significant amount of research done in these areas. However, there is little research on whether knowledge of STIs plays a role in protective sexual behavior.

#### *Trends in STIs*

Since the emergence of the oral contraceptive pill in the 1960s and the growth of its acceptance and use; women are now able to control their reproductivity. The oral contraceptive pill was a great advancement in family planning. It allowed women to have sexual intercourse without fear of becoming pregnant. Ironically, the oral contraceptive pill allows women to have sex without using a condom, exposing them to an increased risk of STIs (Martin, 2006).

Sexually-transmitted infections are on the rise. Chlamydia is the most frequently reported STI in the United States, especially among females ages 15 to 19. The Health Protection Agency (HPA) estimated an increase of over 200% of new cases of chlamydia between 1995 and 2004. Similar spikes in incidences have been seen in other STIs. Since approximately 80% of cases of chlamydia in females and 50% of all chlamydia cases in males are asymptomatic, these numbers are an underestimation of the true burden of STIs (Baird, 2006).

Since such a large majority of these cases are asymptomatic, many people are unaware they have a STI and, therefore, go untreated. At the same time, infected persons continue to spread the STI from partner to partner. This can eventually lead to a public health epidemic with serious consequences.

Sexually-transmitted infections represent risky sexual behavior that can lead to multiple complications; pelvic inflammatory disease, infertility, ectopic pregnancy, cervical cancer, and HIV are just a few of these complications (Blair, 2004; Ford et al., 2004; Trani et al., 2005). Several studies assert that females between the ages of 15 and 24 are at highest risk for contracting an STI (Ford et al.; Johnson-Mallard et al., 2007; Trani et al.). One study indicated that 70% of all people with an STI are between the ages of 15 and 24 (Trani et al.).

With the trends of STIs on the rise, it is clear that something needs to be done to convert this trend to a downward slope. In order for experts to tackle such a problem, one needs to identify variables that contribute to the trends.

#### *Influences on Sexual Behavior*

There are many different reasons why young adults engage in risky sexual behavior. Among these influences are a history of sexual abuse, television, drug and alcohol use, self-esteem, and family dynamics. Several studies (Buzi, Tortolero, Roberts, Ross, Addy, & Markham, 2003; Lang, Rodgers, Laffaye, Satz, Dresselhaus & Stein, 2003) examined influences on sexual behaviors in young adults.

A history of sexual abuse is strongly correlated to risky sexual behaviors, such as a younger age at first voluntary intercourse, infrequent condom use, multiple partners, and not knowing the sexual history of their partners. A correlational design was used to explore the relationship between sexual abuse and sexual behavior. After controlling for age, ethnicity, and family income, Buzi et al. (2003) and Lang et al. (2003) concluded that females with a history of sexual abuse were significantly more likely to engage in sexual activity before the age of 14 years, to report three or more sexual partners in the last 3 months, and have a history of an STI.

Sexual activity is commonly included in sitcoms, television series and advertising. Young adults are at the age where they are very impressionable. Hollywood figures become the young females' role models.

A national longitudinal study indicated that television can account for an increase in risky sexual behavior. After a 1-year follow-up, adolescents who watched more sexual content on television at baseline were more likely to initiate sexual intercourse and progress to more advanced sexual activities in the subsequent year. Television shows that depicted only talk of sexual activity carried the same risk as those shows that depicted the *act* of sexual activity (Collins, Elliot, Berry, Kanouse, Kunkel, Hunter, & Miu, 2004).

Alcohol and drug use have also been associated with sexual risk behavior. A cross-sectional study of 7,441 young people ages 14 to 22 explored the timing of alcohol and other drug use and sexual risk behaviors (Santelli, Robin, Brener, & Lowry, 2001). The data showed that age at initiation of alcohol was strongly associated with failure to use a condom. Recent substance abuse among the young adults was also strongly associated with having had more than one sexual partner in the past 3 months. Lifetime substance use increased the chances of recent multiple partners among females. Santelli et al. suggest that the prevention of sexual risk taking by substance abuse reduction will require a variety of strategies.

Self-esteem is considered an influence on sexual behavior. A longitudinal study about gender differences in self-esteem as predictors of subsequent initiation of coitus in early adolescents revealed that girls with lower-self esteem ratings were three times more likely to initiate early sexual intercourse. The results also indicated that boys with higher self-esteem ratings were more likely to initiate sexual intercourse. This difference

may reflect society's double standard for sexual activity in which early sexual intercourse for boys is not perceived as risky as early sexual intercourse for girls (Spencer, Zimet, Aalsma, & Orr, 2002).

Guiao, Blakemore and Boswell-Wise (2004) suggest that family dynamics is a predictor of sexual behavior. Those adolescents who have less frequent parental involvement, parental monitoring and parent-child communication are more likely to engage in sexual behavior at a young age. For example, adolescent females who communicated less frequently with a parent about sex-related subjects were more likely to engage in risky sexual behaviors (Guiao et al.).

Several studies examine associated factors that influence sexual behaviors. There is a gap in the literature with few studies that examine the knowledge of STIs as an associated factor to sexual behaviors.

#### *Knowledge Deficit*

Knowledge is power. It is asserted that knowledge makes a difference in a person's attitudes, perceptions and behaviors. Several studies suggest that the majority of young people learn about STIs and sexual-related behaviors from the mass media and from their peers (Gokengin, Yamazahn, Ozakaya, Aytug, Ertem, Arda, & Serter, 2003; Nguygen, Liamputtong, & Murphy, 2006; Trani et al., 2005). In one study, STI knowledge came mainly from the mass media (79.3%), despite the fact that the study implied that those who received STI knowledge from their physician had a more accurate understanding of STIs (Trani et al., 2005).

Johnson-Mallard et al. (2007) performed a two-group randomized control pretest/posttest on 104 women to determine whether participating in a 30-minute educational program had a positive effect on knowledge and perceived risk of STIs. The

mean for the intervention group was higher ( $M=26.1$ ,  $SD 2.6$ ), indicating greater knowledge about STIs at post-test, compared with the control group mean at post-test ( $M=21.0$ ,  $SD 2.3$ ). The perceived risk of STIs also increased in the intervention group at post-test ( $M=4.0$ ) when compared to the control group at post-test ( $M=7.9$ ). This study's strong design yielded results that suggest sexual behavior could potentially be changed with an increase in STI knowledge (Johnson-Mallard et al.).

Likewise, a correlational study by Trani et al. (2005) found a significant relationship between STI knowledge and safer sexual behaviors as measured by condom use. Self-reported questionnaires were distributed to a random sample of 644 undergraduate students ages 14 to 20 in Italy to collect information regarding STI knowledge and sexual behavior. The results showed the highest level of knowledge value was reported for syphilis (34.5%) and the lowest value reported was chlamydia (16.5%), despite the fact that chlamydia is much more prevalent in Italy. The results also found younger adolescents and those with less knowledge of STIs were less likely to use condoms.

Nguyen et al. (2006) performed a grounded theory qualitative study on 16 Vietnamese individuals to explore their knowledge of STIs. Nguyen et al. used purposive sampling to conduct in-depth interviews. Nguyen et al. found that despite the prevalence of STIs in the area of sampling, knowledge of STIs among young people in the study was very limited. One participant responded, "I don't know very well. For example, AIDS is transmitted by blood. There seems to be only HIV, nothing else. Generally I just know this disease. I just know this disease from my friends. I don't know more" (Nguyen et al., p. 399).

The sources of STI information came from five main sources. These sources included school-based programs, parents, peers, mass media as health care workers and other social organizations such as youth unions or churches. Nguyen et al. (2006) concluded that creating a climate in which sexual issues are discussed in an open manner is an important step in the improvement of sexual health among young people. By creating such a place, one can improve the contraceptive and STI knowledge in order to improve sexual health among young adults.

In another prospective study, Grande (2002) interviewed 243 sexual workers in Lima and Chile to investigate the knowledge, perception and sexual behavior of sexual workers. The data were entered in SPSS. Seventy (28.8%) women had some degree of elementary education. The weekly number of clients for the sexual workers averaged 18.5 with a standard deviation of 9.3 respectively. When asked about health risks, 15% of the sexual workers answered they did not know the risks of contracting an STI and 29% did not know they risked contracting HIV. Of the 243 workers interviewed, 49% of the participants had a stable partner and 69.3 % of them did not use a condom with their steady partners. Sixteen percent of the participants replied that they did not regularly use condoms with their clients. The reasons given for not using a condom were the refusal of the client to use them and lack of a perception of the risk.

Many studies have been done in different countries such as Vietnam, Italy, Turkey, Chile, and Indonesia in studying STI knowledge and sexual behaviors (Ford et al., 2004; Gokengin et al., 2003; Grande, 2002; Nguyen et al., 2006; Trani et al., 2005). However, few studies are found in the U.S. to determine the correlation between the knowledge of STIs and sexual behaviors.

### *Sexual Behavior*

Condom use decreases the transmission of STIs. A randomized, double-blind, placebo-controlled trial involving 1,862 participants analyzed the effectiveness of condom use in the prevention of herpes simplex virus (HSV) acquisition. The participants were divided into three groups according to the frequency of condom use. Frequent condom users had 26% fewer HSV-2 infections compared with participants in the next lowest category. This study used a rigorous experimental design and appropriate sample size, making it more generalizable. These results indicate that condoms are an effective way of decreasing HSV (Wald et al., 2005).

Other studies report less frequent condom use in lower socioeconomic groups. Self-report questionnaires were distributed at a university in Turkey to 2,217 participants. Results indicated that the number of males who never use condoms was significantly higher than females. Also, students from the middle socioeconomic class were significantly more likely to report always using a condom than those students from the low socioeconomic groups (Gokengin et al., 2003; Shield, Fairbrother & Obmann, 2005).

### *Efforts/Effects*

Many interventions have been used in order to decrease the incidence of STIs. Todd, Haase and Stoner (2001) conducted a clinical trial to assess the prevalence and correlation of asymptomatic genital tract infections with chlamydia and gonorrhea in emergency departments. Participants ages 18 to 30 who presented with non-genitourinary complaints and who willingly participated, completed a questionnaire on sexual behavior and gave a urine sample for the testing of chlamydia and gonorrhea. Three hundred-twelve subjects agreed to participate. Of these 312 participants, 9.3%

were found to have chlamydia, gonorrhea or both. Todd et al. concluded that asymptomatic screening could lead to a decrease in the incidence of STIs.

Several behavioral interventions are effective in decreasing the incidence of STIs. Among these are the use of theoretical models, incorporation of behavioral skills training, emphasis on promoting condom use, helping clients create a personal sexual health plan, use of community and cultural appropriate programs, use of peer educators and community leaders, and appropriate duration of intervention (McKay, 2000).

Colleges have tried to increase awareness of STIs and offer screening and treatment for STIs. Kouman, Sternberg, Motamed, Kohl, Schillinger and Markowitz (2005) conducted a study to estimate the proportion of colleges and universities offering STI services and the proportion of students with access to these services. Kouman et al. distributed surveys to a stratified random sample of schools with an enrollment of 500 or more students. Of the 2,755 schools receiving the survey, 736 responded, giving an 81% response rate.

Kouman et al. (2005) found that 60% of schools had health centers. Four-year colleges were more likely to have a health center compared to 2-year colleges. Those schools with health centers were more likely to provide STI education such as flyers, posters, lectures, health fairs, and one-on-one counseling. However, only 66% of those health centers provided STI services such as screening, diagnosing and treatment. Kouman et al. concluded comprehensive and effective STI education is critical for all college students and more health centers that offer STI services are needed at colleges.

Lloyd, Williams and King (2004), performed a study in a psychiatric unit to test psychiatric patient's knowledge of STIs. The subjects had higher scores on knowledge

of safe sex and on safe sexual practices after taking a 24-question survey and attending a one-time, 1-hour educational session.

Sexually-transmitted infections of bacterial origin such as chlamydia and gonorrhea are on the rise. These bacteria-oriented STIs can lead to pelvic inflammatory disease (PID) and infertility. Miller, Cain, Rogers, Gribble and Turner (1999) conducted a multivariate analysis study to describe the individuals who are contracting STIs. The study showed that women who had sexual intercourse before the age 15 were four times more likely to report having had an STI, and twice as likely to report having PID than those women who had intercourse first after the age 18 (Miller, et al.).

### Summary

The literature reveals that STIs continue to be a public health concern (Baird, 2006). The study by Johnson-Mallard et al. (2007) indicated that increasing the knowledge of STIs can decrease risky sexual behavior. The study by Trani et al. (2005) indicated that young adults with less knowledge of STIs were less likely to use condoms.

Although many studies have been done to examine the influences on sexual behavior and the effectiveness of barriers and programs in preventing the spread of STIs, little research has been done examining the correlation between knowledge of STIs and protective sexual behavior in the U.S.

This chapter discussed the theoretical framework, Beck's HBM, and a review of current literature regarding trends in STIs, influences on sexual behavior, knowledge deficits, protective sexual behavior, and the efforts/effects. This study explored the correlation between knowledge of STIs and protective sexual behaviors.

## CHAPTER III

### METHODOLOGY

The purpose of this study was to identify and describe the relationship between knowledge of STIs and protective sexual behavior of young, female adults aged 18-24 years. This chapter discusses the research design, sample, data collection, and data analysis procedures.

#### Research Design

A non-experimental, descriptive correlational design was used to identify and describe the relationship between the independent variable, STI knowledge, and the dependent variable, protective sexual behaviors. The author chose this particular research design because the objective of this study was to identify and describe the relationship between two variables rather than deduce a cause-effect relationship. Descriptive correlational research also allowed the author to collect a large amount of data about the research problem and still have a strong realism of the data.

Some extraneous variables included age, economic background, and family structure. Extraneous variables were controlled for as best as possible by using a relative homogenous sample of females between the ages 18 and 24 at three family planning clinics in one Midwest state.

#### Population, Sample and Setting

The target population is young females in the Midwest. The accessible population is young females ages 18 to 24 from three family planning clinics in a

Midwestern state. The sample was obtained through a convenience sampling design. The researcher obtained a sample of 103 subjects. Inclusion criteria for the selected sample included females, ages 18 to 24 who are able to read and write English.

The setting for data collection was three family planning clinics that vary in accommodating 250 to 1,500 patients on an annual basis. The family planning clinics are designed for females to receive reproductive health care at an income-based fee including annual physicals, contraception, STI testing and treatment, and any other reproductive-related health care. The facilities are staffed by medical assistants and nurse practitioners who are certified in women's health.

#### Data Collection Instruments

The Sexually Transmitted Infections Survey (STIS) (Appendix A) was used to collect data regarding knowledge of STIs and protective sexual behaviors. This particular tool was selected by the author because of its clarity, thoroughness and layout. Permission for use of the tool was obtained by the author (Appendix B). The original questionnaire consisted of 47 questions that covered demographic data, sexual behaviors, contraceptive behaviors, sources of sexual knowledge, and knowledge of STIs.

The original questionnaire was revised to include pertinent information to answer the research questions for this study. The revised questionnaire included 3 demographic questions including age, marital status, and race; 16 questions regarding sexual behavior; and 11 questions regarding knowledge of STIs. Questions regarding sources of sexual knowledge were omitted to keep the focus on the research questions

for this particular study. The questionnaire consisted of true or false, and some fill-in-the blank questions.

The Sexually Transmitted Infection Knowledge Survey (STIKS) was originally developed by Mary J. Schad, RN, MSN, FNP based on conceptual and theoretical knowledge derived from the literature. The face, content, and construct validity of the questionnaire was established by four experts in the field of STIs and sexual practices—three nurses and two young adults in non-health care related fields. The author of the STIKS conducted a pilot study with 10 subjects between the ages 18 and 25 who were able to speak and write English. Internal consistency was computed for each of the five dimensions of the questionnaire. The coefficient alpha ranged from 0.1227 to 0.7548 with a total reliability of 0.60. The face, content, and construct validity was re-established, after modifying the original survey, by three experts in the field of women's health, STIs, and education and three nurses and three young adults in non-health care related fields.

#### Data Collection Procedure

Data collection began after approval from the University of Wisconsin Oshkosh Institutional Review Board (IRB) (Appendix C) and the family planning clinics in the Midwest. The nurse practitioner at each individual clinic and the coordinator of the family planning clinics for the region was contacted in order to obtain permission for data collection. Participant protection was ensured by complying with the guidelines set by the IRB. Data collection was conducted by using a convenience sampling of females ages 18 to 24 from three family planning clinics in a Midwestern state.

Participation in the study was voluntary. No identifying information was put on the survey packets to ensure anonymity. Data collection packets were distributed to all three participating family planning clinics. The data collection packets included a letter to the survey distributors explaining the purpose of the research and explaining how to distribute the surveys, including how to store the data collected (Appendix D), and the surveys with a cover letter to the participant including informed consent.

Surveys were distributed to participants over a 4-week period. The medical assistants at each of the family planning clinics asked any qualifying female if she would participate in a research study after they had checked in at the front desk. If the female agreed, she was given a survey packet to complete at the site. The packet included an informed consent letter (Appendix E), briefly explaining the purpose of the research and the STIS.

Participants completed the survey packet in approximately 15 minutes. The participants read the informed consent letter, the voluntary nature of the study, and the steps taken to assure confidentiality and anonymity of all information obtained. The participant then completed the survey in the waiting area of the clinic. If the participant felt more comfortable completing the survey in a private room, this was provided. Once participants completed the surveys, they returned them to the medical assistant in a sealed envelope without identifying information on it. The medical assistant placed the sealed envelope in a locked filing cabinet to ensure security of data collected until the researcher collected the data at the end of the 4 weeks.

A pilot study was conducted with 10 voluntary participants in order to ensure ease of administering the survey packets. The pilot study helped to determine a more accurate time needed for participants to complete the survey, identify any parts of the

survey that were difficult to understand or offensive, and helped to determine if the surveys yielded data with sufficient variability. After the pilot study was completed, the author determined no change was necessary in the data collection procedure.

#### Data Analysis Procedure

Computer analysis of the quantitative data was done using the SPSS computer program. The researcher used frequency distributions and bivariate descriptive statistics to analyze the data. The data from the STIS Survey were coded, entered into SPSS and described utilizing descriptive statistics, Pearson's *r* correlations, and independent *t*-tests. The data were then be compiled into tables.

Pearson's *r* correlation coefficient was used to measure interval and ratio data within the STIS, to describe the relationships between knowledge of STIs, sexual behaviors, age at first intercourse, and having a history of a STI. The alpha level was set at  $< .05$ . Independent *t*- tests were used to describe the relationships between those participants having a history of a STI and those participants who did not have a history of an STI related to knowledge of STIs, sexual behaviors, and age at first sexual intercourse.

#### Limitations

The limitations of the study included:

1. Convenience sampling was utilized, which may have yielded a risk of sampling bias.
2. The sample was taken from three clinics in one geographical area limiting the study's generalizability.

3. Since the purpose of the study was to explore a relationship rather than to deduce a cause-effect relationship, the correlational design allows for limited control of extraneous variables.
4. Self-administered tools were used for data collection; therefore, the data were based on the participants' honesty.

### Summary

This chapter discussed the research design, sample design, data collection instruments, data collection procedure, data analysis and limitations. Although there were limitations in this study, the data generated from this research can begin to provide nurse practitioners with a baseline assessment of STI knowledge in young females. Chapter IV presents the findings of this study and includes a discussion based on the findings.

## CHAPTER IV

### RESULTS AND DISCUSSION

The results of this study are presented in this chapter. The purpose of this study was to identify and describe the relationships between the knowledge of sexually transmitted infections and sexual behavior; having a history of a STI related to sexual behavior and knowledge of STIs; and the relationship between age at first intercourse in regards to sexual behavior, knowledge of STIs, and history of having a STI. A description of the sample participants is provided and followed by a discussion of the findings in the study in relation to the research questions.

#### Description of the Sample

Data were collected over a 4-week period at three family planning clinics in a Midwestern state. One hundred twenty-five surveys were distributed among the three clinics; 103 surveys were returned for a return rate of 82.4%. All but 6 of the surveys were used in data analysis, with a sample size 97. Six survey packets were not included in the sample due to subjects reporting that they were younger than 18 years of age. The participants of the study ranged in age from 18 to 24 with a mean age of 20.84 and a standard deviation of 2.02 (Table 1). All the participants in the study were female.

Table 1

*Ages of Participants*

Age	Number of Participants	Percent
18	15	15.5%
19	16	16.5%
20	15	15.5%
21	14	14.4%
22	11	11.3%
23	13	13.4%
24	13	13.4%

Of the respondents, 62 (63.9%) indicated that they were single. Two (2.1%) of the respondents were married, one (1.0%) participant indicated was separated, and 32 (33.3%) were living with a significant other. None of the participants indicated they were divorced or widowed (Table 2).

Table 2

*Marital Status*

Response	Frequency	Percent
Single	62	63.9%
Married	2	2.1%
Separated	1	1.0%
Living with significant other	32	33.3%

Ninety-five respondents (97.9%) were White. One respondent (1%) was Asian, and one respondent (1%) was Hispanic. None of the participants indicated being Black, Native American or Hawaiian/Pacific Islander.

### Sexual Behavior

The STIS was divided into three sections: (a) demographic data, (b) sexual behavior, and (c) STI knowledge. The researcher coded the sexual behavior section by assigning one point for those behaviors considered at risk (multiple partners, having sexual intercourse with someone at first meeting, etc.), no points for those behaviors considered neutral, and negative points for those behaviors considered safe sexual practices (always using a condom). Questions 5, 15, 17, 18, and 19 were excluded from the total score due to the nature of the questions. These questions will be discussed in more detail later in this chapter. The scores were tallied and each participant given an overall score for the sexual behaviors section of the survey.

Of the total sample of 97, one respondent reported never having had sexual intercourse. Question five on the sexual behaviors section asked participants the age at which they first had sexual intercourse. The ages ranged from 12 to 22 with a mean age of 16.42 and a standard deviation of 1.79. The mean age of first sexual intercourse was slightly lower than the national average of 17.4 years (DHHS, 2007).

The participants were asked if they were ever treated for an STI. Of the 97 participants, 55 had been treated for a STI in the past. One participant (1%) reported being treated for gonorrhea, seven (7.2%) reported being treated for genital herpes, six (6.2%) reported being treated for genital warts, one (1%) for trichomonas, 13 (13.4%) for

HPV, 15 (15.5%) for chlamydia, and 12 (12.4%) participants reported being treated for bacterial vaginosis (Table 3).

Table 3

*Reported STIs*

STI	Frequency	Percent*
Gonorrhea	1	1.0%
Genital Herpes	7	7.2%
Genital Warts	6	6.2%
Trichomonas	1	1.0%
HPV	13	13.4%
Chlamydia	15	15.5%
Bacterial Vaginosis	12	12.4%

\*Due to not every subject having had a STI, and some subjects having more than one STI, percentages do not add to 100%.

Question 17 asked the participants what precautions they were taking, if any, to protect themselves from acquiring a STI. Fifty-seven (58.8%) participants reported using a condom, two (2.1%) participants reported using spermicides, 57 (58.8%) participants reported having a long-term partner, six (6.2%) participants reported using abstinence, and four (4.1%) participants reported "other" (Table 4). The four participants who marked "other" all reported birth control as being a method they use to protect themselves from acquiring an STI.

Table 4

*Methods of STI Protection*

Total Score	Frequency	Percent
Condoms	57	58.8%
Spermicides	2	2.1%
Long-term partner	57	58.8%
Abstinence	6	6.2%
Other	4	4.1%

When asked how consistent participants were in the use of STI protection measures in question 18, eight (8.2%) reported never using STI protection measures, 14 (14.4%) reported rarely using STI protection measures (approximately every fourth time with intercourse), 14 (14.4%) reported occasionally using STI protection measures (every other time), 32 (32.9%) reported always using STI protection measures, and 34 (35.1%) reported using contraception measures (birth control pill, Nuva ring, Depo Prevera, IUD, etc.) only to prevent pregnancy (Table 5).

Table 5

*Consistency in Use of STI Protection*

Total Score	Frequency	Percent
Never use STI protection	8	8.2%
Rarely use STI protection	14	14.4%
Occasionally use STI protection	14	14.4%
Always use STI protection	32	32.9%
Only use contraception protection	34	35.1%

When participants were asked why they do not use STI protection measures, nine (9.3%) participants reported not having a condom, five (5.2%) participants did not know the dangers associated with not using a condom, 28 (28.9%) of the participants reported condoms as not providing the same feeling as using no condom, and 12 (12.4%) participants reported "other" (Table 6). Of the 12 who reported "other," eight participants wrote in they had a long-term partner. The other responses included: "married and monogamous"; "sexual partner knows STI history and together we do not feel the need for them [condoms]; we know the risks"; "did at the start—same guy for 4 years"; and "using Depo shot—don't want condoms."

Table 6

*Reasons for not Using STI Protection*

Reason	Frequency	Percent
Did not have a condom	9	9.3%
Unaware of STI dangers	5	5.2%
Does not feel the same	28	28.9%
Other	12	12.4%

After coding the sexual behavior section and entering the data in the SPSS computer data analysis system, each participant was given a total score for the sexual behavior portion of the survey. Scores for the sexual behavior section ranged from -1.0 to 11.0 with a mean of 5.59 (SD = 2.63).

#### Knowledge of STIs

The knowledge of STI section asked the participants 11 questions regarding their knowledge of sexually transmitted infections. The survey was coded in a similar fashion as the sexual behavior section. One point was given for each question answered correctly. The questions marked "check all that may apply" were given one point for each correct box response. Each participant's score was then tallied to get an overall score for the knowledge of STI section of the survey. Scores for the participants' knowledge of the STI section of the survey ranged from 1.0 to 8.0 with a mean of 6.57 (SD=1.47).

### Research Question One

What is the relationship between knowledge of STIs and sexual behaviors in young adult females?

The main purpose of this research was to answer the question: What is the relationship between knowledge of STIs and sexual behaviors in young adult females? Analysis of the data was computed utilizing Pearson's correlation coefficient to identify any relationships between the sexual behavior score and the knowledge of STI score, as well as the direction of the relationship.

A Pearson correlation coefficient was calculated for the relationship between participants' knowledge of STI scores and sexual behavior scores. A moderate negative correlation was found ( $r[97] = -.458, p < .01$ ) (Table 7); indicating a significant inverse relationship between participant's knowledge of STIs and their sexual behavior. The more the participants knew of STIs, the less they engaged in risky sexual behavior. These results support the author's hypothesis that as young females are more knowledgeable about STIs and their consequences, they will be more likely to practice protective sexual behaviors.

Table 7

*Pearson R Correlations*

	Knowledge of STI score	Sexual Behavior Score	Age at first Intercourse	Number of partners	History of STI
Knowledge of STI score	1	-.458	.332	*-.244	-.332
Sexual Behavior Score	-.458	1	-.514	**-.717	.584
Age at first intercourse	.332	-.514	1	-.440	-.362
Number of Partners	*-.244	**-.717	-.440	1	.431
History of STI	-.332	.584	-.362	.431	1

\*Correlation is significant at the 0.05 level (2-tailed)

\*\*Results are falsely elevated due to the same question being included in both scores

These results support previous studies done by Johnson-Mallard et al (2007). Their study suggested that risky sexual behavior could potentially be decreased with increased STI knowledge. Trani et al. (2005) also concluded that the less knowledge one has about STIs, the less likely one is to engage in protective sexual behaviors (Trani et al.). These findings also correlate well with the theoretical framework used for this study, Beck's HBM (Becker, 1974). Those participants who did not know STIs could be a potential threat to their health did not take actions to prevent STIs.

Smith (2006) reported conflicting results. He found the more knowledge nursing students had of HPV and cervical cancer, the more they engaged in riskier sexual behaviors such as unprotected sexual intercourse and having multiple sexual partners.

The results from this study are encouraging because they give health care providers encouragement to continue educating young females in sexual health

practices. With more knowledge about STIs, young females in this study engaged in fewer risky sexual behaviors.

### Research Question Two

Is there a correlation between sexual behavior and having a history of an STI? A Pearson correlation coefficient was calculated for the relationship between participant's sexual behavior scores and having had a history of a STI. A moderate positive correlation was found ( $r[97] = .584, p < .01$ ), indicating a significant linear relationship between the participant's sexual behavior score and having a history of a STI. These results indicated that the females who had a higher total score on the sexual behavior section of the survey (indicating riskier sexual behaviors) were more likely to have had a history of an STI.

An independent-sample *t* test comparing the mean scores of the sexual behavior section and having a history of an STI with those who did not have a history of an STI found a significant difference between the mean scores of the two groups ( $t[97] = 7.02, p < .001$ ) (Table 8). The mean score on the sexual behavior section of those who had a history of a STI was significantly higher ( $m = 7.93, SD = 1.98$ ) than the mean sexual behavior scores of those who did not have a history of an STI ( $m = 4.56, SD = 2.21$ ) (Table 9).

Table 8

#### *Group Statistics T-Test*

	Mean	SD	T	P
Sexual knowledge of STI	5.83	1.87	-3.41	P < .01
Sexual behavior	7.93	1.98	7.02	P < .001
Age at first intercourse	15.45	1.89	-3.75	P < .001

Table 9

*Independent-Samples T-Test: Group Differences of Those With History of STI*

	N	History of STI	Mean	SD
Sexual Knowledge of STI Score	29	YES	5.83	1.87
	68	NO	6.89	1.13
Sexual Behavior Score	29	YES	7.93	1.98
	68	NO	4.56	2.21
Age at first intercourse	29	YES	15.45	1.89
	68	NO	16.85	1.58

These results indicate that those females who had a higher score on the sexual behavior section of the survey (indicating they engaged in riskier sexual behaviors, had a higher incidence of having had a history of a STI, when compared to those females who had a lower score on the sexual behavior section (indicating they engaged in safer sexual practices). These results are consistent with prior studies that concluded that the more risky sexual behaviors one participates in; the more likely he/she will acquire an STI (Wald et al., 2005; Blair, 2006).

#### Research Question Three

Is there a correlation between knowledge of STIs and having a history of a STI?

A Pearson correlation coefficient was calculated for the relationship between participants' knowledge of STI scores and having a history of an STI. A statistically negative correlation was found ( $r[97] = -.332, p < .01$ ), indicating a significant inverse relationship between the participants' knowledge of STI score and having a history of an STI. These results indicate that those females with lower scores on the knowledge of STI section of the survey (indicating less knowledge of STIs) were more likely to have had a history of an STI.

An independent-samples  $t$  test comparing the mean scores of the knowledge of STIs section and having a history of a STI with those not having a history of an STI found a significant difference between the mean scores of the two groups ( $t[97] = -3.41$ ,  $p < .01$ ). The mean knowledge of STI scores of those who had no history of an STI was significantly higher ( $m=6.89$ ,  $SD 1.13$ ) than the mean of those who had a history of an STI ( $m=5.83$ ,  $SD 1.87$ ). These results suggest that those females who had a history of an STI had a lower knowledge of STIs than those who did not have a history of an STI.

McKay's (2000) previous research calls for better educational programs would help decrease the incidence of STIs young people. Hu, Wang, Liu, Yang, Ye, Cao and Zhang. (2005) also reported similar results in a study implemented in China. Hu et al. found that those subjects with less knowledge of STIs had a higher incidence of having an STI.

#### Research Question Four

What is the relationship between age at first intercourse and sexual behavior, knowledge of STIs, and having a history of a STI?

##### *Age at First Sexual Intercourse and Sexual Behaviors*

A Pearson correlation coefficient was calculated for the relationship between the participant's age at first sexual intercourse and sexual behavior. A significant negative correlation was found ( $r[97] = -.514$ ,  $p < .01$ ), indicating a significant inverse relationship between the participant's age at first intercourse and sexual behavior scores. These results indicate as age at first intercourse lowered (the younger the female was at time of first sexual intercourse); behavior scores went up (the more likely she was to engage in risky sexual behaviors).

These results were also supported in this research by an incidental finding when Pearson's correlation coefficient identified a significant negative correlation between age at first intercourse and number of sexual partners ( $r[97] = -.440, p < .01$ ); indicating that the younger the females were at first intercourse, the more sexual partners they had; adding a risk factor of acquiring an STI. These results are consistent with prior research (Blair 2006; Buzi et al., 2003; Lang et al., 2003).

Trani et al. (2005) also found a significant relationship between age at first sexual intercourse and safer sexual behaviors. The results of their study indicated that the younger adolescents are at first sexual intercourse, the less likely they are to use a condom and engage in protective sexual behaviors.

#### *Age at First Intercourse and Knowledge of STIs*

A Pearson correlation coefficient was calculated for the relationship between the participant's age at first sexual intercourse and knowledge of STIs scores. A positive correlation was found ( $r[97] = .332, p < .01$ ), indicating a significant linear relationship between the participant's age at first sexual intercourse and knowledge of STI scores.

These results indicate that the younger females are at first sexual intercourse, the less knowledgeable they are about STIs and the consequences of acquiring an STI. This validates the position that sexual education needs to start at a younger age.

Hu et al. (2005) reported similar results when they found a significant difference in knowledge of sexual health scores between the adolescent group and adult group. It reinforces the need for nurse practitioners to educate young female patients at an even earlier age about abstinence and protective sexual behaviors.

*Age at First Intercourse and History of an STI*

A Pearson correlation coefficient was calculated for the relationship between the participant's age at first intercourse and having a history of an STI. A significant negative correlation was found ( $r[97] = -.362, p < .01$ ), indicating a significant inverse relationship between the participant's age at first intercourse and having a history of an STI. These results indicate as age at first intercourse declined (the younger the female was at first intercourse), the more likely she was to acquire an STI.

An independent-sample *t*-test comparing the mean age at first intercourse and having a history of an STI with those not having a history of an STI found a significant difference in mean age between the two groups ( $t[97] = -3.75, p < .001$ ). The mean age of those who had a history of an STI was significantly lower ( $m=15.45, SD=1.89$ ) than the mean age of those who did not have a history of having an STI ( $m=16.85, SD=1.58$ ). These results indicate that those females who had a history of having a STI, had engaged in intercourse at a younger age than those who did not have a history of having an STI. International surveillance data shows that 70% of those with STIs are ages 15 to 24 (Trani et al. 2005).

These findings are consistent with previous research findings. Taylor-Seehafer and Rew (2000) found the younger a female was at onset of intercourse, the overall increased risk she had of acquiring an STI. These findings also make sense from a biological standpoint. There is a predominant amount of columnar epithelial cells on the outer surface of the cervix for up to 3 to 4 years after menarche. Furthermore, immune protective factors on the outer surface of the cervix do not further develop for 3 to 4 years after menarche. Inflammatory STIs such as chlamydia, gonorrhea, syphilis and HPV are more likely to grow in this environment (Taylor-Seehafer & Rew).

Miller et al. (1999) reported similar findings: women who had first sexual intercourse before age 15 were four times more likely to have had an STI and twice as likely to have PID than those women who had intercourse for the first time after age 18.

### Summary

This chapter presented the results of the study while outlining the demographic characteristics of the sample. The study findings were also discussed in relation to the research questions. The purpose of this study was to examine the relationship between knowledge of STIs and sexual behaviors in young adult females.

Correlations were found between knowledge of STIs and sexual behaviors: having a history of a STI in correlation with sexual behaviors and knowledge of STIs.

Correlations were also found between the knowledge of STIs and sexual behavior; having a history of an STI related to sexual behavior and knowledge of STIs; and the relationship between age at first intercourse related to sexual behavior, knowledge of STIs, and history of having an STI. Chapter V presents a summary of findings, conclusions and recommendations for further research.

## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

This chapter provides a summary of the research study. The conclusions that can be drawn from this study, as well as the implications for nursing practice are discussed. In addition, a discussion of the limitations of the study and recommendations for future studies are presented.

#### Summary

The main purpose of this non-experimental, descriptive correlational study was to identify and describe the relationship between knowledge of STIs and sexual behavior in young adult females; as well as identify and describe the relationships between having a history of a STI related to sexual behavior and knowledge of STIs and the relationship between age at first intercourse related to sexual behavior, knowledge of STIs, and history of having an STI. Beck's (1974) HBM served as the theoretical framework for the study.

A non-probability, convenience sample (n=97) of young women ages 18 to 24 was used from three family planning clinics in a Midwestern state. The mean age of the sample was 20.84. The majority of the sample was single (63.9%), White (97.9%) participants.

Institutional review board approval was obtained prior to collecting data, as well as approval from the sites where data collection took place. Participation was voluntary and had no reflection on the services provided at the three family planning clinics. The

STIS was used to collect data regarding knowledge of STIs and sexual behaviors. The survey was divided into three sections: demographic data, sexual behavior and knowledge of STIs

Willing participants between the ages of 18 and 24 and who could read and write English were given a survey packet at routine scheduled visits. The survey packet included an informed consent letter, the STIS, and a return envelope. Participants completed the surveys in the waiting area of the clinic and returned them to the reception desk in a sealed envelope. The researcher collected the sealed envelopes at the end of a 4-week period.

The surveys were coded and scored in a manner to give a total score for the sexual behavior section and a total score for knowledge of STIs section. The data were then entered into the SPSS program. Descriptive statistics, Pearson's coefficient correlation and independent *t*-tests were utilized to describe the relationships between knowledge of STIs and sexual behavior in young adult females, as well as to identify and describe the relationships between having a history of a STI related to sexual behavior and knowledge of STIs and the relationship between age at first intercourse related to sexual behavior, knowledge of STIs, and history of having an STI.

Scores for the sexual behavior section ranged from -1.0 to 11.0 with a mean of 5.59 (SD= 2.63). Scores for the knowledge of STIs section ranged from 1.0 to 8.0 with a mean of 6.57 (SD= 1.47).

Significant correlations were found between: (a) knowledge of STIs and sexual behavior, (b) having a history of a STI related to sexual behavior and knowledge of STIs, and (c) the relationship between age at first intercourse related to sexual behavior,

knowledge of STIs, and history of having an STI. Incidental findings were also found between age at first intercourse and number of sexual partners.

Pearson's correlation coefficient was used to identify relationships and independent *t*-tests were used to compare groups. The following relationships were found:

1. A statistically significant negative correlation between knowledge of STIs and sexual behaviors ( $r[97] = -.458, p < .01$ ).
2. A statistically significant positive correlation between scores on the sexual behavior section and having a history of an STI ( $r[97] = .584, p < .01$ ). A significant difference was found when comparing the mean sexual behavior scores and having a history of an STI with those not having a history of an STI ( $t [97] = 7.02, p < .001$ ).
3. A statistically significant negative correlation between knowledge of STI scores and having a history of an STI ( $r[97] = -.332, p < .01$ ). A significant difference was found when comparing the mean knowledge of STI scores for those who had a history of an STI compared with those who did not have an STI ( $t [97] = -3.41, p < .01$ ).
4. A statistically significant negative correlation between age at first intercourse and sexual behaviors scores ( $r[97] = -.514, p < .01$ ).
5. A statistically significant negative correlation between age at first intercourse and number of sexual partners ( $r[97] = -.440, p < .01$ ).
6. A statistically significant positive correlation between age at first intercourse and scores on the sexual knowledge section of the survey ( $r[97] = .332, p < .01$ ).

7. A statistically significant negative correlation between age at first intercourse and having a history of a STI ( $r[97] = -.362, p < .01$ ). A significant difference was found between the mean age at first intercourse and having a history of an STI when compared to those who did not have a history of an STI ( $t [97] = -3.75, p < .001$ ).

### Conclusions

Based upon the findings in this study, the following conclusions are predicated:

1. Young adult females who have more knowledge regarding STIs are less likely to engage in risky sexual behaviors.
2. Young adult females who engage in riskier sexual behavior are more likely acquire to an STI compared with those young adult females who do not engage in risky sexual behaviors.
3. Young adult females who have more knowledge of STIs are less likely to acquire an STI compared to those young adult females with less knowledge of STIs.
4. Young adult females who have intercourse at a younger age engage in riskier sexual behaviors.
5. Young adult females who have sexual intercourse at a younger age are more likely to have multiple sexual partners.
6. Young adult females who have intercourse at a younger age have less knowledge of STIs than those young adult females who have sexual intercourse at a later age.

7. Young adult females who have sexual intercourse at a younger age are more likely to acquire an STI when compared to those young adult females who have sexual intercourse at a later age.

### Implications for Nursing

The outcomes of this study can be utilized in many ways. Direct patient care in primary care offices, policy implementation, academic curriculum for the APNP programs and community/public based programs are some areas that the outcomes of this study have potential to impact. The results of this study suggest that STI knowledge does have an impact on sexual behavior. This can give APNPs motivation and incentive to prioritize time during an office visit to discuss and educate young females on sexual health behavior.

Advanced practice nurses in primary care have optimal opportunities to assess and evaluate a young woman's sexual practices. It is the responsibility of the APNP to educate young women about initiating and maintaining safe sexual practices in order to reduce the incidence of STIs and the consequences that follow. The first important step in initiating and maintaining safe sexual practices in young patients is building a level of trust and establishing a relationship in which the young female feels comfortable discussing sexual issues.

Once a level of trust is established, the APNP is able to encourage and facilitate discussions about sexual health as a normal part of a health care visit for all young females. According to this and other research, it is important to target these females at a young age (<16 yrs). Increasing knowledge of STIs may have a huge impact on decreasing the incidence of STIs and the complications that follow STIs such as pelvic

inflammatory disease, infertility, HPV, cervical cancer, miscarriage, spread of infections to others, and low self-worth.

Advanced practice nurse prescribers should utilize every opportunity to educate patients about safe sex practices. As Beck's (1974) HBM implies: Patients need to be educated about their susceptibility to STIs, the severity and complications that go with acquiring a STI, and the benefits of using STI protection. It is the APNP's job to help the patient overcome the barrier to using STI protection by discussing these barriers, giving suggestions on how to overcome barriers, and providing community resources where patients can get more information or financial assistance to help them achieve optimal sexual health.

If these things start at a younger age, they are more likely to become habit for the young patients and continue into adulthood. APNPs have an opportunity to work with young females on a daily basis. It is important to seize every opportunity for health teaching related to sexual health promotion.

Knowing the outcomes of this study may also facilitate implementing new policies in the primary care. In order to consistently and adequately assess a young female's sexual health, it is important to have a policy in place. The results of this study could be utilized to develop an adequate sexual health assessment section on patient health history forms. By doing this, the APNP would be able to identify risky behavior that would put the patient at a higher risk of acquiring a STI. This would also provide an opportunity for open discussion of sexual issues while the APNP reviews the health history form with the patient.

In order for nurse practitioners to assess and educate young female patients regarding sexual health, it is critical to incorporate sexual health education in the APNP

program curriculum. Faculty teaching in graduate nursing programs need to prepare upcoming APNPs to discuss sexual health with young females. The master-prepared nurse should feel comfortable and confident identifying high-risk groups, explaining the disease process and accompanying complications of STIs, as well as educating the patient on disease prevention.

Decreasing the incidence and prevalence of STIs nationwide starts at the community level. The information in this study can be used to support community programs on sexual health promotion. It is clear that more accurate and adequate education needs to be done regarding sexual health in order to reduce the behaviors that put a young female at risk of acquiring a STI. The information provided in this study can be utilized to apply for grants and increased financial support that could help build more community programs and provide more resources for young females to promote sexually healthy lifestyles. These programs could include more family planning clinics in the communities, especially in rural areas or more resources available to the existing clinics; more aggressive sexual health education at a younger age in the schools; and more widespread STI awareness and resources on college campuses.

Community programs need to be visible and accessible at optimal times for the adolescent population. The APNP should provide sexual health education in a nonjudgmental manner with guided discussion where young females do not feel threatened, but feel comfortable discussing their sexual health.

### Limitations

Limitations of the study include:

1. The results were based on responses of 97 women ages 18 to 24. A larger sample including younger participants may derive more statistically significant data.
2. The results were based on a non-random homogeneous sample; therefore, generalizability is limited.
3. The study only looked at four variables: sexual behaviors, knowledge of STIs, having a history of an STI, and age at first sexual intercourse. However, there may be many other variables involved.
4. Women in the study were contacted through three family planning clinics in a Midwestern state. This sample may reflect women who are more concerned about their health than the general population.

### Recommendations

The researcher offers the following recommendations for further research based on the data obtained from this study:

1. Replication of the study using a larger sample size with younger (ages 15-24) participants.
2. Replication of the study using a more culturally diverse population in a larger geographical area.
3. Replication of the study using men as well as women for subjects.
4. Qualitative research to explore themes and other possible variables associated with sexual behavior in young women.

5. Replication of the study using a different measurement tool.

### Final Thoughts

Sexually transmitted infections are a rising health concern, especially in the young female population. It is important for the APNP to become actively involved with the program and become a patient advocate. This not only includes educating young females about sexual health in the primary care setting, but also at a community level in the school, college and public programs. Advanced practice nurse prescribers can also become involved at a higher level by supporting professional organizations and political candidates who advocate for promotion of sexual health in young females.

It is important that family nurse practitioners in primary care are comfortable discussing sexual issues and educating their patients. The first step in decreasing the incidence of STIs and promoting healthy sexual behaviors in young females begins with providing accurate and adequate information. In order to make a difference, APNPs need to take an aggressive, active role, in decreasing the incidence of STIs.

APPENDIX A  
Sexually-Transmitted Infections Survey

## Sexually-Transmitted Infections Survey

1. Age: specify (Write in) \_\_\_\_\_

**Check your best response**

2. Status:

- Single       Married       Separated  
 Divorced       Widowed       Single and living with sexual partner

3. What is your race?

- Caucasian       African-American       Asian       Native American       Hispanic  
 Hawaiian/Pacific Islander       Other \_\_\_\_\_

**Sexual Behavior**

4. Have you ever been or are you currently sexually active (intercourse, genital contact)?

- Yes       No

5. At what age did you first have sexual *intercourse*? \_\_\_\_\_

6. How many sexual partners have you had within your lifetime?

- None       1       2  
 3-4       5 or more

7. Have you ever had sexual relations with a member of the same sex?

- Yes       No

8. Have you ever engaged in rectal (anal) sex?

- Yes       No

9. Have you ever had sex with someone you know was sexually active with other partners?

- Yes       No       Not sure

10. Have you ever had sex with someone you just met or didn't know?

- Yes       No

11. Have you ever been high on drugs or alcohol that you had sex without wanting it?

- Yes       No

12. Have you ever been high on drugs or alcohol that you had sex without knowing it?

- Yes       No

13. Have you ever traded sex for drugs, money, or alcohol?

- Yes       No

14. Have you ever been treated for a sexually transmitted infection (STI)?

- Yes       No

15. If you have been treated for a sexually transmitted infection in the past, which one was it?

- |  |   |   |                                      |
|--|---|---|--------------------------------------|
| <input type="checkbox"/> Gonorrhea/Clap/Drip | <input type="checkbox"/> Syphilis         | <input type="checkbox"/> Genital Herpes   | <input type="checkbox"/> AIDS        |
| <input type="checkbox"/> Genital Warts       | <input type="checkbox"/> Trichomonas/Tric | <input type="checkbox"/> Pubic Lice/Crabs | <input type="checkbox"/> HPV         |
| <input type="checkbox"/> Chlamydia           | <input type="checkbox"/> Hepatitis A      | <input type="checkbox"/> Hepatitis B      | <input type="checkbox"/> Trick/Trich |
| <input type="checkbox"/> Bacterial Vaginosis |   |   |                                      |

16. Have you ever discussed/suggested using protection during sex to prevent a sexually transmitted infection?

- Yes       No

17. Are you taking any precautions at the present time to protect yourself against acquiring a sexually transmitted infection?

**Check all that apply**

- use of condoms       use of spermicides  
 have a long term or one sexual partner       abstinence  
 Other \_\_\_\_\_

18. Sexually Transmitted Infection (STI) Protection

**Read each option before selecting the response most typical/usual for you**

- Never use STI protection measures (i.e., condom, spermicides, etc.)  
 Rarely use STI protection measures (approximately every fourth time with intercourse)  
 Occasionally use STI protection measures (every other time)  
 Always use STI protection measures  
 Use contraception protection only to prevent pregnancy (such as the pill, Nuvaring, Depo Provera, IUD, condom, etc.)

19. If you are not currently using sexually transmitted infection protection the reasons why are:

**Check all that may apply**

- Embarrassed to buy condoms       Not convenient (easy) to buy  
 Don't have time to put condom on       Embarrassed to talk about it with sex partner  
 Did not have a condom       Didn't know of the dangers of STIs  
 Doesn't feel the same       Other (write in) \_\_\_\_\_  
 Don't want to appear easy by being prepared for sex

### Sexually Transmitted Infection (STI) Knowledge

The following questions are regarding sexually transmitted infection knowledge. Answer each question to the best of your ability.

20. What type of health problem could result from untreated or poorly treated sexually transmitted infections, if any?

**Check all that may apply**

- None       Pelvic Inflammatory Disease (PID)  
 Abdominal Pain       Sterility (not able to have children)  
 Urinary Tract Infection       Infection of others  
 Blindness       Miscarriage and/or pregnancy complications  
 Cancer       Death

**21.** Which of the following symptoms might make a person think they have sexually transmitted infection?

**Check all that may apply**

- |   |  |
|---|--|
| <input type="checkbox"/> burning/pain upon urination      | <input type="checkbox"/> unusual discharge from vagina or penis  |
| <input type="checkbox"/> itching in genital area          | <input type="checkbox"/> sores/blisters in genital area          |
| <input type="checkbox"/> foul odor from vagina            | <input type="checkbox"/> enlargement of glands in groin area     |
| <input type="checkbox"/> bleeding after intercourse (sex) | <input type="checkbox"/> rash on palms of hands or soles of feet |
| <input type="checkbox"/> pain with intercourse (sex)      | <input type="checkbox"/> reddened rash on penis                  |
| <input type="checkbox"/> enlarged scrotum                 | <input type="checkbox"/> nausea/vomiting                         |
| <input type="checkbox"/> lower abdominal pain             | <input type="checkbox"/> cough                                   |
| <input type="checkbox"/> diarrhea                         | <input type="checkbox"/> aching joints                           |
| <input type="checkbox"/> fever                            | <input type="checkbox"/> other _____                             |

**For the following questions: Check your best response**

**22.** If you use a condom during sexual intercourse you can not get infected with a sexually transmitted infection.

- True                                       False                                       Not sure

**23.** You can not get infected with a sexually transmitted infection from having oral sex (using your mouth in the genital area)

- True                                       False                                       Not sure

**24.** If you have rectal (anal) sex, you are safe from getting a sexually transmitted infection.

- True                                       False                                       Not sure

**25.** Once you have been treated for sexually transmitted infection, you can not get it again.

- True                                       False                                       Not sure

**26.** Some sexually transmitted infections go away by themselves without treatment.

- True                                       False                                       Not sure

**27.** All sexually transmitted infections can be cured.

- True                                       False                                       Not sure

**28.** Someone can be infected with a sexually transmitted infection and not know it.

- True                                       False                                       Not sure

**29.** You would be able to tell if your partner was infected with sexually transmitted infection.

- True                                       False                                       Not sure

**30.** Which of the following do you think is a sexually transmitted infection?

**Check all that may apply**

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Gonorrhea/Clap/Drip | <input type="checkbox"/> Syphilis         | <input type="checkbox"/> Genital Herpes   |
| <input type="checkbox"/> Genital Warts       | <input type="checkbox"/> Trichomonas/Tric | <input type="checkbox"/> Pubic Lice/Crabs |
| <input type="checkbox"/> Candida/Yeast       | <input type="checkbox"/> Chlamydia        | <input type="checkbox"/> Hepatitis A      |
| <input type="checkbox"/> Bacterial Vaginosis | <input type="checkbox"/> AIDS             | <input type="checkbox"/> Trick/Trich      |
| <input type="checkbox"/> Hepatitis B         | <input type="checkbox"/> HPV              | <input type="checkbox"/> Endometriosis    |

**Thank you for taking your time to complete this survey!**

APPENDIX B

Permission from Author to Use Survey

Friday, July 13, 2007

To: mayerh72@uwosh.edu

My name is Mary J. Schad. In 1992, I published a Thesis in Partial Fulfillment of the Requirements for the Degree of

Master of Science in Nursing. The Thesis submitted was entitled: Knowledge of Sexually Transmitted Diseases and the

Relationship to Sexual Behaviors in Unmarried Young Adults, 18 - 25 Years Old.

I now give my permission for students who wish to use all or any part of this thesis for their own research.

I may be contacted at: [schadrussmary@silvercity-nm.com](mailto:schadrussmary@silvercity-nm.com) or written to at:

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APPENDIX C

UW Oshkosh IRB Approval Letter



October 29, 2007

Ms. Heather Mayer  
1242 Robin St.  
De Pere, WI 54115

Dear Ms. Mayer:

On behalf of the UW Oshkosh Institutional Review Board for Protection of Human Participants (IRB), I am pleased to inform you that your application has been approved for the following research: Knowledge of Sexually Transmitted Infections and the Relationship to Sexual Behaviors in Young Adult Females.

Your research has been categorized as EXEMPT. This means you will not be required to obtain signed consent. However, unless your research involves **only** the collection or study of existing data, documents, or records, you must provide each participant with a summary of your research that contains all of the elements of an Informed Consent document, as described in the IRB application material. Permitting the participant, or parent/legal representative, to make a fully informed decision to participate in a research activity avoids potentially inequitable or coercive conditions of human participation and assures the voluntary nature of participant involvement.

Please note that it is the principal investigator's responsibility to promptly report to the IRB Committee any changes in the research project, whether these changes occur prior to undertaking, or during the research. In addition, if harm or discomfort to anyone becomes apparent during the research, the principal investigator must contact the IRB Committee Chairperson. Harm or discomfort includes, but is not limited to, adverse reactions to psychology experiments, biologics, radioisotopes, labeled drugs, or to medical or other devices used. Please contact me if you have any questions (PH# 920/424-7172 or e-mail:rauscher@uwosh.edu).

Sincerely,

Dr. Frances Rauscher  
IRB Chair

cc: Rosemary Smith  
1255

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APPENDIX D  
Letter to Survey Distributors

July 2007

Dear Survey Distributor:

You are being asked to assist me in the data collection procedure of a research study on sexually transmitted infection knowledge and sexual behaviors. This study is being done as part of the requirement for me to earn my Masters of Science Degree in Nursing. The data that will be obtained from the study will be used to help improve areas in women's health.

Please distribute the enclosed survey packets to any female between the ages 18 and 24 years, who is able to read and write English *and* who agrees to participate in the research study. The survey packet will take the participants approximately 10-15 minutes to complete and must be completed in the facility. Please assure privacy as they complete the surveys. All of the information will be kept confidential. Please DO NOT have the girls include their name or any identifying information on either of the surveys.

Once the surveys are completed and handed back to you, please secure them in a locked filing cabinet to ensure confidentiality and anonymity of all collected data.

Thank you for taking the time to aid in the education of a future health care provider and improving the education of young adults! If you have questions, please contact me at the address or phone number listed below.

Sincerely,

Heather Mayer, BSN, RN  
Graduate Student

APPENDIX E  
Letter to Participants

Dear Participant:

You are being asked to participate in a research study on sexually transmitted infection knowledge and sexual behaviors. This study is being done as part of the requirement for me to earn my Masters of Science Degree in Nursing. The data that will be obtained from the study will be used to help improve educational areas in women's health.

As part of this study, you will be asked to complete two surveys that will take about 10-15 minutes of your time. Your participation in the study is completely voluntary. You do not have to participate and can stop at any time. If you refuse to participate now, it will have no effect on any regular services or benefits available to you at this clinic.

I do not anticipate that the study will present any medical or social risk to you, other than the inconvenience of the extra time required for you to answer the survey. Participation in this study may not benefit you directly.

All of the information will be kept confidential. DO NOT include your name or any identifying information on either of the surveys. No information in the study will identify you personally. It cannot be traced back to you.

Once the survey is completed, I would be glad to give the answers to you. If you have any complaints about your treatment as a participant in the study, please call or write:

Chair, Institutional Review Board  
c/o Grants Office- UW Oshkosh  
800 Algoma Boulevard  
Oshkosh, WI 54901  
(920) 424-1415

Although the chairperson may ask for your name, all complaints are kept in confidence.

If you fill out and return the questionnaires, it is assumed that you have read and understood this information and that you consent to participate in this survey. Thank you for taking the time to consider participation in my study. If you have questions, please contact me at the address or phone number listed below.

Sincerely,

Heather Mayer, BSN, RN  
Graduate Student

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