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Computer-based Sex Education for High School Students

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COMPUTER-BASED SEX EDUCATION FOR HIGH SCHOOL STUDENTS

by

ASHLEY JONES, RN, BSN, DNP STUDENT

EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing

of Valparaiso University,

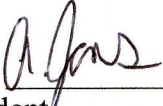
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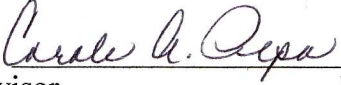
in partial fulfillment of the requirements

For the degree of

DOCTOR OF NURSING PRACTICE

2012


Student _____ Date 5/14/12


Advisor _____ Date 5/14/12

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DEDICATION

I would like to dedicate this project to my family and many friends who have supported me along my BSN to DNP journey. To my parents AJ and Kay, thank you for instilling in me a passion for serving the community with kindness and compassion to all no matter their race or socioeconomic status. To my sister, Lindsay, and sister-in-law, Carol, thank you for being constant cheerleaders and making me get out and do something other than school work. And to my brother, Ben, you have been the most influential person for me. You have taught me that every task is only a test of endurance and with my stubborn determination, I can do anything. To my many friends, thank you for supporting me even though the phone calls were infrequent and getting together was even more infrequent. But, most of all, thank you all for believing in me when I did not believe in myself, without all of you this would have never become a reality.

ACKNOWLEDGMENTS

I would like to thank Pennfield School District for allowing me the opportunity to complete this EBP project, specifically high school Principal Barry Duckham, program director Ed terSteeg, and the School Board. The Human Sexuality Committee, especially Cindy Scharns, the parent representative who went above and beyond to help implement this project, thank you. However, without Dr. Carole Pepa's guidance, patience, kindness, and wisdom, I would not have been able to complete this project. Thank you Dr. Pepa.

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ABSTRACT

Adolescents are four times more likely than other age groups to contract chlamydia or gonorrhea. In the USA, young people between 15 to 24 years of age acquire almost half of all newly diagnosed sexually transmitted infections (STI) a year. The purpose of this computer-based sex education EBP project was to increase student knowledge regarding transmission, disease process, and treatment for STIs, as well as to reduce high risk sexual behaviors. The evidence-based practice model for change and the Modeling, Role-Modeling nursing theory guided this project. Computer-based sex education is supported in research. Articles critiqued, utilizing Melnyk and Fineout-Overholt (2011) levels of evidence, were at a level six or higher. The setting for this project, a rural high school (HS) in Michigan, does not have a sex education curriculum. Yet, Michigan requires a student to have STI and HIV/AIDS education at least once during HS. In this EBP project, freshmen biology students received one 50 minute class that provided computer-based sex education modules. Students viewed the educational modules on their individual laptop computers with headphones. Prior to receiving the computer-based sex education, freshmen and senior students received a survey with pretest through zoomerang.com. Two months after implementation of the computer-based sex education, the same survey with post-test were administered to freshmen and senior students, also through zoomerang.com. Data from the survey were analyzed utilizing descriptive statistics. Freshmen students increased knowledge of sexual health after computer-based sex education and reduced sexual activity in the two months after implementation. However, the computer-based sex education did not increase condom use among those who were sexually active. Providing students with a demonstration of proper condom use in future educational modules may assist with improving condom use among those that are sexually active.

Keywords: computer-based, sex education, high school

CHAPTER 1

INTRODUCTION

Background

Sex education is taught from elementary through high school (HS) to students throughout the country. Students receive sex education in multiple forms: face to face contact, handouts, peer to peer education, and a combination of teacher and peer taught education. However, in this generation of booming technology, students are not learning about sex education in the classroom; rather they are looking to the internet for sex education information. Students prefer to go on the internet to find information (Keller & La Belle, 2005). The internet provides websites for students; however, most students are afraid they may pull up sexually explicit things like porn (Keller & La Belle, 2005). High schools in the Midwest are starting to provide freshmen in HS with laptop computers to use throughout their HS careers. Students feel comfortable utilizing technology to access information (Keller & La Belle, 2005). Traditional forms of sex education may not be as effective with this generation of students who rely on technology.

Education requirements regarding sexual transmitted infections (STIs), including human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS), vary depending on the state. Each state has its own requirements for the education. Some states, including Michigan (MI), require the education of HIV, AIDS, and other STIs be taught sometime during HS. Education regarding HIV, AIDS, and other STIs has become essential for adolescents aged 15 to 24 years of age because rates for these infections are excessively high nationally (Center for Disease Control and Prevention [CDC], 2009a & CDC, 2009b).

Adolescents are four times more likely than other age groups to contract chlamydia or gonorrhea (CDC, 2009b). In the United States (US), young people between

15 to 24 years of age acquire almost half of all newly diagnosed STIs a year (CDC, 2009b). From 2008 to 2009 the incidence of Chlamydia among adolescents 14 to 19 years of age, increased by 2.4% (CDC, 2009b). According to the Center for Disease Control (CDC) (2010), 1,927 new cases of HIV were diagnosed in 2008 among adolescents aged 13 to 19 years in the US. According to the Michigan Department of Community Health (MDCH) (2011), as of 2008 2,980 young people aged 13 to 24 years of age live with HIV or AIDS in Michigan and from 2003 to 2007, newly diagnosed cases of HIV increased on average 24% per year. In 2010, MI had 760 newly diagnosed cases of HIV; however, from January to June 2011, MI had already diagnosed 269 new cases of HIV, of which 74 were between 13 and 24 years of age (MDCH, 2011). As of July 2011, 2,628 13 to 24 year olds live in MI with HIV (MDCH, 2011). Calhoun County, MI had a 14% increased incidence of Chlamydia among adolescents aged 15 to 19 years from 2009 to 2010 (MDCH, 2009a & MDCH, 2010a). STI infections are on the rise while funding in the county is being cut.

Due to economic decline, school funding, as well as county funding, has been decreased to meet budget requirements. Sex education courses require a certified educator or licensed healthcare professional to facilitate sex education (State of Michigan, Legislative Council, 1976). Training an educator to be certified in sex education takes time and money. Utilizing a licensed healthcare professional can also be expensive for the school district, as well as time consuming for the healthcare professional. One way to reduce cost is through computer-based sex education modules. Computer-based sex education modules can eliminate the cost of hiring a healthcare professional or training a teacher because all education would be provided by computer-based modules and developed by a healthcare professional. A meta-analysis conducted by Noar, Black, and Pierce (2009) concluded that computer-based interventions reduced sexual activity, increased condom use, reduced the number of

sexual partners and STIs. Computer-based interventions (CBI) are also more efficacious than human-delivered sex education interventions (Noar, Black, & Pierce, 2009). In addition, CBI lowers costs of sex education by using technology to educate students. Portnoy, Scott-Sheldon, Johnson, & Carey (2008) also conducted a meta-analysis of research studies that studied computer-based interventions for health promotion. Throughout the study a theme occurred, computer-based interventions were more successful when samples were mainly women, adolescents, or young adults (Portnoy, Scott-Sheldon, Johnson, & Carey, 2008).

Statement of Problem

Sexually transmitted infection rates in Calhoun County, MI were higher than the overall Michigan STI rates among 15 to 19 year olds in 2010. Chlamydia rates for Calhoun County remained 21.6% above the state rates for this age group (MDCH, 2010a), and gonorrhea rates remained 24.8% above State rates for 2010 (MDCH, 2010b). Computer-based sex education is supported in research to increase knowledge (Bailey et al., 2010); teens feel more comfortable accessing sexual health information from computers (Keller & La Belle, 2005), increase safer sex behaviors (Roberto et al., 2007), and decrease overall sexual encounters as well as number of partners (Lightfoot, Comulade, & Stover, 2007). A rural Midwest HS in Calhoun County, MI does not have a sex education curriculum for the HS students. The school provides sex education to fourth, fifth and eighth grade students. For these classes, health teachers were provided with funds and given the time to attend required classes necessary to be certified to teach sex education. However, the HS does not have an educator with the appropriate education required to teach sex education. A goal of the school district's Human Sexuality Committee (HSC) during the 2011/2012 school year was to develop a sex education curriculum for the HS. Computer-based sex education modules, developed by a healthcare professional, will provide the curriculum necessary to meet district and state

requirements for sex education as well as decrease costs to the school district by not having to train a teacher and not have to hire someone to come in for the day to teach sex education.

Purpose of the EBP Project

The purpose of this computer-based sex education EBP project was to increase student knowledge regarding transmission, disease process, and treatment for sexually transmitted infections, as well as reduce high risk sexual behaviors. Specifically, the population, intervention, comparison, outcome, time (PICOT) question addressed will be: In high school students, will two classes of comprehensive computer-based education on transmission, treatment, and prevention of sexually transmitted infections increase knowledge as well as decrease risky sexual behaviors compared to current knowledge and behaviors over a two month period?

Significance of the Project

Computer-based education modules may increase student knowledge of STIs and decrease risky sexual behaviors over time. The goal of sex education in HS students is to decrease the incidence of STIs. Formulating a curriculum for the rural MI high school will decrease cost for the school by providing a computer-based education curriculum facilitated by a licensed healthcare professional. It will also provide evaluation data upon which to make future decisions about the delivery modality of sex education content. Providing students with knowledge regarding their sexual health will empower them to make informed decisions regarding their sexual health. Students prefer the use of the computer to look up information regarding their sexual health, so students may be more receptive to computer-based sex education (Keller & La Belle, 2005). Overall, computer-based sex education may improve student knowledge and decrease risky sexual behaviors, while reducing costs for the HS.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

Chapter two appraises the theoretical framework, EBP model, and review of literature (ROL). Modeling role-modeling (MRM) will be utilized as the theoretical framework for this EBP project. Implementation of this project will be conducted using the EBP model for change. The review of literature includes search engines, keywords, as well as inclusion and exclusion criteria utilized to assess the literature. Literature will then be critically synthesized to support the EBP project as well as to provide a guideline for the use of computer-based sex education.

Theoretical Framework

MRM theory allows the nurse to look at the world from the perspective of the patient (Erickson, Tomlin & Swain, 1983). In this project, the DNP student was able to see the world from the perspective of students. The DNP student provided unconditional acceptance, nurturance, and facilitation in every encounter with the students. Students brought lifetime growth and development to each encounter. During these encounters the students modeled their world for the DNP student through their environment, adaptation, self-care knowledge, and resources (Erickson et al., 1983). The DNP student then geared education and intervention based upon these encounters by role-modeling the students' world. After the students received the sex education provided by computer based intervention, they were then able to use it to provide self-care action, optimal health status, and holism. MRM allowed the DNP student to relate to students based upon their view of their world. Literature supports that using computer-based sex education interventions provides students with increased knowledge regarding sexually transmitted infections (Bailey et. al, 2010). However, with MRM students need to have the desire to change and provide self-care action to achieve optimal health status. If students do not feel the need to change, or improve healthcare, then optimal health

status and self-care action cannot be achieved. MRM is ineffective in making change if the student does not want to change. Every theoretical framework could have this predicament, but MRM does take a unique look into the world of the students by the nurse.

EBP Model of Implementation

Adoption of a new practice should be guided by an evidence based practice model. The model of evidence based practice change will guide this EBP project.

The evidence based practice change model includes six steps: (1) assess need for change in practice (2) find best evidence (3) critically analyze evidence (4) design practice change (5) implement and appraise change in practice, and (6) incorporate and maintain change in practice (Melnyk & Fineout-Overholt, 2011, pp. 255-256).

Step one is identifying the problem. In this project, increases in STI transmission among 15-19 year olds as well as lack of knowledge regarding STIs are the two key problems identified for this project. Evidence of this is reflected in the annual CDC and MDCH statistics regarding STIs. Lack of knowledge leads to unsafe sexual habits as well as an increase in STI statistics, so educating HS students may increase knowledge to potentially increase safe sex practices. Key stakeholders should be involved with the adaptation of the new practice and identifying the problems (Melnyk & Fineout-Overholt, 2011). The human sexuality committee at a rural HS in the Midwest participated in the adaptation of this project, as well as the school board, and assistance from the Calhoun County STI clinic health educator. After identifying the problem, searching for evidence to support the change in practice is step two. For this step, a search of data bases, such as CINAHL and MedScape, was conducted. In addition, an evaluation of the guidelines for the school district and state was performed since certain content is required to be taught in HS sexual health classes. Critically appraising the evidence is step three.

When analyzing the evidence, it was important to assure that the change being implemented would provide a positive change as well as be beneficial to the HS and students receiving the education (Melnyk & Fineout-Overholt, 2011). Including the stakeholders with the change was key to ensure that the project met state and school district requirements, and was crucial to assure the project will benefit the students. Stakeholders participated in step four, designing practice change. Designing the practice change included formulating the computer-based sex education modules, consent and assent forms, survey with pre-tests, post-tests with survey, and IRB submission forms. Step five was the evaluation of the project, which was in the form of comparing the survey responses and pre-test answers to the post-test answers and survey responses administered to the students. Feedback from the tests enabled the primary investigator to draw conclusions and to identify implications for future change. Lastly, in step six the evidence was disseminated to the stakeholders, so a permanent change can be implemented. The evidence-based practice change model guides one through a step by step guide to implement EBP, including involving the stakeholders. Stakeholders were key assets in the implementation of this EBP project due to working with HS students. Information will be disseminated to the stakeholders, the HSC, and school board.

Literature Search

A literature search was conducted utilizing search engines provided by the Valparaiso University Christopher Center Library. Initially article abstracts were obtained and compared to the inclusion and exclusion criteria. If the article met the inclusion criteria and did not get excluded with the exclusion criteria, the full article was reviewed and then compared to the inclusion and exclusion criteria; if it also met all inclusion criteria, and not excluded with the exclusion criteria, it was then appraised for level of evidence.

Sources examined for relevant evidence. Valparaiso University Christopher Center Library provided multiple search engines for the literature search. The following data bases were utilized: Cumulative Index of Nursing and Allied Health (CINAHL), Medline via EBSCO, Proquest, Cochrane Library, PubMed, Education Resources Information Center (ERIC) via EBSCO, ERIC, and education abstracts. Keywords utilized to navigate initially included: sex education and e-learning; sex education and web-based, and sex-education and computer. Based upon few results from the initial search, a second search was conducted using the following keywords: sexually transmitted disease (STD) education and web-based, and STD education and computer. For each search, the following inclusion criteria were used to filter articles: English language, published 2005 to current, evidence-based practice, research, peer reviewed, and age criteria of adolescent or HS. Exclusion criteria based upon reading abstracts included: condom use, unprotected sex, STI testing, attitudes toward education, sexual dysfunction, parents opinion on abstinence only, family growth, circumcision, contraception, adults, college students, smoking cessation, acupuncture, surgical, weight reduction, mental health, cystic fibrosis, published prior to 2005, conducted in another country, men having sex with men (MSM), substance abuse, violence, vaccinations, middle school students, cervical cancer, and hearing impaired participants.

An initial search was conducted on May 26, 2011 of CINAHL, Medline via EBSCO, Proquest, Cochrane Library, PubMed, ERIC via EBSCO, ERIC, and Education abstracts. Articles were included or excluded based upon information provided in the abstract. CINAHL search yielded only one article with the key words sex education and computer. Medline via EBSCO yielded no articles for sex education and e-learning; seven articles for sex education and web-based, but only two articles met inclusion criteria and not exclusion criteria; sex education and computer yielded 12 articles, but only three met inclusion criteria and not exclusion criteria. Proquest yielded only two

articles one with the key words sex education and e-learning and one with sex education and computer-based. Cochrane Library yielded no articles for sex education and e-learning, 14 articles for keywords sex education and web-based with only one article that met criteria, and 35 articles for sex education and computer, but only one article met criteria. PubMed yielded nine articles for sex education and e-learning; however, not one of the articles met inclusion and were excluded with the exclusion criteria; sex education and web-based yielded eight articles with two of which met criteria; sex education and computer yielded six articles, and only one met criteria. ERIC via EBSCO did not yield any articles. Two articles were identified through ERIC, but they did not meet criteria. Educational abstracts yielded no articles for keywords sex education and e-learning; one article for keywords computer and web-based that met criteria; and one article for sex education and computer that met criteria. Exploring multiple data bases provided an extensive search for articles related to this EBP project; however, overlap of the same articles found in multiple search engines did occur. After the literature search, an assessment was conducted to ensure articles met inclusion criteria and did not meet exclusion criteria. After assessing the articles, only three articles met all inclusion and did not meet exclusion criteria: Adoun et al. (2011); Cox, Scharer, and Clark (2009); and Roberto et al. (2007).

As a result of finding only three articles, a second search was conducted utilizing different keywords. Instead of using sex education, sexually transmitted disease education was used in combination with web-based and computer. Inclusion and exclusion criteria were not altered. On May 31, 2011 CINAHL, Medline via EBSCO, and Proquest were searched using STD education and web-based and STD education and computer. CINAHL yielded zero articles with key words STD education and web-based; however, STD education with computer yielded 16 articles with 10 of the abstracts meeting inclusion criteria, but not the exclusion criteria. Medline via EBSCO generated a

total of 55 articles; 23 with the keywords STD education and web-based with three articles meeting inclusion and not the exclusion criteria; and 32 articles with the keywords STD education and computer, nine of these articles' abstracts met inclusion and not the exclusion criteria. Proquest generated 32 articles. Keywords STD education and web-based produced one article that did not meet inclusion criteria, and the keywords STD education and computer generated 31 articles with three meeting inclusion criteria. On June 1, 2011 Cochrane Library and PubMed were searched using the same key words STD education with web-based and computer. Cochrane Library generated five articles with keywords STD education and web-based, two articles met criteria. Keywords STD education and computer generated 16 articles with only one meeting inclusion criteria. PubMed generated 46 articles. STD education and computer did not generate any articles. STD education and web-based generated 46 articles, but no articles met inclusion criteria. Articles were then assessed from this search and only three new articles met criteria: Bailey and colleagues (2010); Ito, Kalyanaraman, Ford, Brown, and Miller (2008); and Keller and La Belle (2005).

A final search was conducted on June 2, 2011 searching ERIC via EBSCO and ERIC databases using STD education with web-based and computer. ERIC via EBSCO generated 11 articles. Keywords STD education with web-based yielded one article that did not meet criteria and keywords STD education with computer yielded ten articles; three met inclusion criteria.

After all data bases were searched, a hand search was conducted. Reference lists were examined from each article that had been assessed and met inclusion criteria and had not been excluded was completed. Two articles had references that met inclusion criteria for this EBP project. Adoun and colleagues (2011) yielded two articles and Bailey and colleagues (2010) yielded two articles.

An article assessment of articles obtained during the June 2nd search and hand search was conducted on June 3, 2011. After the article assessment, two articles met inclusion and not the exclusion criteria: Noar et al. (2009); and Portnoy et al. (2008). On June 6, 2011 an article assessment was completed on two last articles that met inclusion criteria: Gold, Chiappetta, Young, Zuckoff, and DiClemente (2008) and Lightfoot, Comulade, and Stover (2007).

Critically appraising the evidence. Critical appraisal of the evidence was conducted utilizing Fineout-Overholt and Stillwell (2011) levels of evidence. Evidence was then rated from level one to level seven. Evidence rated level one provides confidence that the findings are reliable and use the most laborious research methods (Fineout-Overholt & Stillwell, 2011). Moving down the levels of evidence from one to seven, confidence of findings decreases with each level descent (Fineout-Overholt & Stillwell, 2011). Examples of each level of evidence are as follows: level one includes meta-analyses and systematic reviews of randomized control trials (RCTs); level two RCTs; level three nonrandomized controlled trials; level four cohort study or case-control studies; level five meta-synthesis of qualitative or descriptive studies; level six qualitative or descriptive single studies, and level seven expert opinion (Fineout-Overholt & Stillwell, 2011, p. 33).

Based upon the levels of evidence listed above, each article that met inclusion criteria was appraised. From the searches conducted, ten articles met all inclusion and not the exclusion criteria. The following articles are evidence level one: Bailey and colleagues (2010); Noar et al. (2009); and Portnoy et al. (2008). Three articles are evidence level two: Roberto and colleagues (2008); Gold and colleagues (2008); and Ito and colleagues (2008). Lightfoot and colleagues (2007) as well as Cox and colleagues (2009) articles are evidence level three. Keller and LaBelle (2005) published an article based upon the data that were published in 2004 by Keller, LaBelle, Karimi, and Gupta

(2004). Keller et al. (2004) conducted a descriptive study and analysis of websites containing sexual health content. So, the Keller and LaBelle (2005) article is a level six. The last article Adoun and colleagues (2011) was not able to be categorized in a level of evidence because Adoun et al. (2011) is a review of what research is currently being conducted based upon the Bailey et al. (2010) article. Overall, for this EBP project evidence that has been retrieved can be categorized as evidence level one to six and can be critiqued with confidence in their findings.

Construct EBP

Critically appraised literature synthesized. Meta-analyses and research has been conducted to compare computer-based sex education to other forms of sex education. This research, that was conducted, supports computer-based sex education to increase in sexual health knowledge, decrease in sexual activity and high risk sexual behaviors, and decrease in cost to deliver computer-based education (Bailey et al., 2010 & Roberto et al., 2007).

Sexual health knowledge. Bailey and colleagues (2010) conducted a systematic review that included RCTs of computer or internet-based interventions that were directed toward improving sexual health. Bailey et al. (2010) included 15 RCTs in their review which had a total of 3917 participants. Studies included in the systematic review compared computer-based interventions to usual sex education procedures, face to face educational sessions, and written information. Studies were excluded if they were not able to be conducted without the assistance of an educator (Bailey et al., 2010). Data from these RCTs were analyzed with the standardized mean difference (SMD) using Cohen's rules of thumb. A measurement of 0.2 is small, 0.4 is moderate, and 0.8 is a large effect. The meta-analysis indicated a statistically significant effect on sexual knowledge with a SMD of 0.72, a moderate effect on knowledge with computer-based intervention (Bailey et al., 2010). One weakness to this meta-analysis is that sexual

knowledge was measured; however, knowledge was separated by reproductive knowledge and knowledge of STIs and HIV.

A study conducted by Ito and colleagues (2008) developed a pilot-test and interactive computer-based intervention aimed at the prevention of STIs in female adolescents. Participants included 47 female adolescents who received the computer-based intervention with standard of care or only the standard of care (Ito et al., 2008). Data were collected using a four point Likert scale. Knowledge of HIV and STIs increased significantly in the computer-based intervention and standard of care with a $p = .02$ ($p < 0.001$) (Ito et al., 2008). Knowledge of STI and HIV was increased; however, overall knowledge of condom use and prevention of high risk sexual behaviors were not increased.

In a rural HS, a computer and internet based intervention was implemented to prevent pregnancy, STI, and HIV in adolescents (Roberto et al., 2007). Nine high schools in the United States participated in the cluster randomized control trial study with a sample size of 887 participants. The control group received the standard sex education; and the experimental group received six computer-based activities over a seven week period instead of the standard sex education (Robert el al., 2007). Roberto and colleagues (2007) measured knowledge using an eight item test with answers of true, false, and I do not know. Data supported that the intervention group that received the computer-based intervention demonstrated significantly greater knowledge than the control group (Roberto et al., 2007). All three articles appraised supported the use of computer-based intervention for sex education.

Decrease in sexual activity and high risk behaviors. Bailey and colleagues (2010), not only assessed knowledge of computer-based education, but they also assessed sexual behaviors. Effects of sexual behaviors in the 15 RCTs were compared based upon the computer-based education. Cohen's rule of thumb using SMD was used

to measure the effect for the systematic review (Bailey et al., 2010). Results from this study were based on computer-based interventions completed in the RCTs. Sexual behaviors measured included: safer sex intentions, condom use, and condom use in the last 30 days. Overall sexual behavior results were not significant for condom negotiation or use; however, there was a moderate effect on condom use in the last 30 days in one study included in Bailey et al. (2010). When the data were taken from only four studies regarding condom use, the results were statistically significant. Increased use of condoms, which results in safer sex practices and decreased risky sexual behaviors, is a positive effect concluded with computer-based sex education on high risk sexual behaviors.

Lightfoot et al. (2007) conducted a nonrandomized controlled trial with participants aged 14 to 18 years old who were attending three alternative education schools. The study compared computerized HIV education and small group HIV education to current practice of no education (Lightfoot et al., 2007). Results were measured at baseline and three months post intervention. Participants in the computer-based intervention were less likely to engage in sexual activity ($p = .02$) when compared to the small group over the three months after the intervention (Lightfoot et al., 2007). Over time participants of the computer-based ($p < .01$) and small group ($p = .03$) both had fewer sexual partners than the control group. The computer-based group reported less unprotected sex over time, but this was not statistically significant (Lightfoot et al., 2007). Computer-based education had a positive effect on the reduction of sexual encounters and number of partners within the first three months post education.

A meta-analysis was conducted by Portnoy et al. (2008) evaluating the efficacy of computer-based interventions for health promotion and behavioral risk reduction. Inclusion criteria for the meta-analysis, conducted by Portnoy et al. (2008) included the

following: RCTs; implemented computer-based education; followed health domains related to Healthy People 2010, and assessed behavior change or objective health outcomes (Portnoy et al., 2008). Computer-based educational interventions were effective in increasing safer sexual behaviors compared to other forms of education. Internet based computer interventions were also more successful than compact disc-read only memory (CD-ROM) delivered interventions (Portnoy et al., 2008). Based upon the 75 studies reviewed, by Portnoy et al. (2008) safer sexual behaviors improved with computer-based intervention.

Roberto and colleagues (2007) conducted a computer and internet based intervention involving nine rural high schools in the United States, with a sample size of 887 ninth graders. Condom self-efficacy was measured on a five point Likert scale and attitude toward waiting to have sex was also measured on a five point Likert scale (Roberto et al., 2007). Ninth graders in the intervention group had a significantly greater condom self-efficacy and favorable attitude toward waiting to have sex, as well as a perceived greater susceptibility to HIV than those in the control group (Roberto et al., 2007).

A systematic review of studies investigating efficacy of computer-based interventions was conducted by Noar et al. (2009). The purpose of the systematic review was to analyze studies that increase condom use with computer-based interventions in high risk groups. A total of 12 studies were utilized for this review. Total participants for all 12 studies equaled a sample of 4639 (Noar et al., 2009). Effect size was analyzed using Cohen's *d*. All twelve studies evaluated outcomes on condom use, with a $d = .259$, indicating that computer-based interventions had a statistically significant effect on condom use behavior (Noar et al., 2009). Studies also reported on frequency of sexual behaviors ($d = .427$) and reported STIs ($d = .140$). There was a reduction in sexual

behaviors and STIs reported as well as a decrease in the number of sexual partners in those who had computer-based interventions (Noar et al., 2009).

Overall, literature supports computer-based interventions to decrease sexual activity and high risk sexual behaviors. High risk sexual behaviors can be reduced by using condoms with each sexual encounter, decreasing the number of sexual partners, and going to receive testing.

Decrease in cost and increase satisfaction. Providing an educator that is qualified and willing to teach HS students about sex education can be challenging. Ito and colleagues (2008) developed a CD-ROM that provided adolescents with the knowledge necessary to make positive choices regarding their sexual health. Adolescents' knowledge was increased after viewing the CD-ROM regarding HIV and STIs (Ito et al., 2008). By utilizing the computer via CD-ROM or internet, an educator is not necessary to teach small group or face to face interventions (Portnoy et al., 2008); this will reduce the costs.

A study conducted by Gold et al. (2008) assessed the reproductive educational program based on choice of education with computer-based motivational intervention with didactic counseling to prevent STIs and pregnancy. Females aged 13 to 21 years old committed to 18 months of participation and returned to the clinic every three months during this time frame (Gold, Chiappetta, Young, Zuckoff, & DiClemente, 2008). Overall the females liked learning about STIs, as well as being able to move at their own pace through the education. They also liked being able to ask questions after the education (Gold et. al., 2008). Providing young people with the option of moving at their own pace through education as well as answering their questions empowers them to make positive choices regarding their sexual health.

Adolescents frequently have questions regarding their sexual health and look to the internet for answers (Keller & La Belle, 2005). Parents need to be equipped with the

knowledge and resources to answer their children's questions when asked. A study conducted by Cox et al. (2009) developed a web-based program to educate mothers on how to talk to their children about sex. Forty mothers participated in the study. Overall, the participants had an increase in growth and knowledge related to HIV, STIs, and communication with their children. Providing adolescents with knowledge is not enough. Parents also need to have access to the sex education their children receive. Parents will then be equipped to answer questions and talk with their children regarding their sexual health.

Best practice model recommendation. Computer-based sex education for this project included a review of all forms of sex, STIs, HIV, AIDS, condoms use, abstinence, and places within the city to get checked for sexually transmitted infections, HIV, AIDS, and pregnancy. HIV, AIDS, and other STIs education are currently taught by a trained HS biology teacher by mandate from the state of MI (State of Michigan, 1976). If the education is not taught by a trained teacher, the educational material regarding HIV, AIDS, and other STIs may be taught by a licensed healthcare professional. For this EBP project, a computer-based sex education curriculum was developed by a licensed healthcare professional. The curriculum was developed as a voice over PowerPoint presentation. Education was divided into four presentations. The first presentation was an overview of all forms of sex, other forms of intimacy, how to protect one's self from STIs, HIV, AIDS, and pregnancy, as well as abstinence. After the overview, the second presentation covered bacterial STIs. Presentation three covered viral STIs including HIV and AIDS. The last presentation reviewed the first three presentations and also covered where students can go to be tested for STIs, HIV, AIDS, and pregnancy in the city. Students were able to view and listen to the PowerPoint presentations on their personal laptops, going at their own pace. They then were able to ask questions from the healthcare professional after each presentation. The content covered in the PowerPoint

presentations was consistent with the guidelines established from the school's HSC (HSC, 2005). Students were provided with education developed by a healthcare professional to ensure accurate information was administered. Using voice over PowerPoint presentations allowed students to move at their own pace as well as access the presentations from home. Not only could students access the presentations from home, but parents were also able to view what their children were taught. Based on the previously reviewed evidence, computer-based education increases student (Bailey et al., 2010) and parent (Cox, Scharer, & Clark, 2009) knowledge regarding STIs, HIV, and AIDS. Computer-based education allowed privacy for the students while they are learning about sensitive information. For the purposes of this EBP project, students' knowledge and sexual behavior were measured in the form of a survey with a true and false test prior to administering education and two months after the education they received.

Guideline for EBP project. By recommendation from the school and state mandate, freshmen students received sex education that includes communicable diseases including HIV, AIDS, and other STIs. No guidelines, as to date of this writing, had been established for administration of sex education. However, state and school requirements and guidelines were utilized to develop and implement this computer-based sex education project.

Providing students with computer-based sex education may increase their overall knowledge of sex, STIs, HIV, and AIDS. Increasing student knowledge, in return, may decrease risky sexual behavior such as multiple partners and not using condoms. Providing students with the knowledge regarding their sexual health may empower them to make positive choices regarding their sexual behaviors. Utilizing best practice one was able to measure if students increased knowledge from computer-based education and decreased high risk sexual behaviors.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

Step four of the Model for Evidence-Based Practice Change provides a guide to assist with designing and implementation of a practice change. Throughout the implementation of practice change, step four, the definition of proposed change, identification of resources necessary for change, as well as the implementation design plan (Melnik & Fineout-Overholt, 2011) are identified in this chapter for this EBP project.

Sample and Setting

A rural Midwestern HS was the setting for this project. A convenience sample of freshman biology students were utilized as participants. Currently, the state of Michigan requires that HIV, AIDS, and other STIs be covered in biology class. Recruiting the students occurred by obtaining parental consent and student assent. By request of the HSC, senior students participated in the surveys with pre and post-test to compare data, but did not participate in the computer-based sex education modules. The HSC wanted to compare the sexual behaviors and knowledge of seniors to those of the freshmen before and after the implementation of freshmen computer-based sex education. Senior students took the surveys with pre and post-tests in English class on October 3, 2011 and December 5, 2011, the same days the freshman students took the surveys with pre and post-tests. To review the survey with pre-tests see Appendices A and B. To review the survey with post-test for freshmen see Appendix C and Appendix D for the senior survey with post-test.

Planning

Preparation for the project started with a meeting of the key stakeholders in the community and school district. Key stakeholders included the HSC, school board, Calhoun County health department STI clinic health educator, principal, and administrative program director. The HSC develops, implements, and evaluates all sex

education curricula. One goal of the 2011/2012 school year was to develop a sex education curriculum for the HS. Co-chair of the HSC, who was also a parent member, welcomed the idea of a curriculum developed by a healthcare professional. However, all new curricula must be approved by the school board. Presenting a new curriculum to the school board occurred at the August 2011 school board meeting. The current HS principal was also in agreement with the computer-based sex education. Computer-based sex education taught by a licensed healthcare professional cut the cost of training a current educator to teach sex education as well as the cost of contracting an outside educator from the health department to come in and educate the students for two days. The administrative program director was also supportive of computer-based sex education. Utilization of computer-based sex education may cut costs and benefit the school district as well as the students. Feedback is a requirement of the state every two years in the form of a pre and post-test to assess student knowledge of current sex education curriculum; this project provided the school district with the feedback necessary to assess student knowledge to report back to the state.

Once key stakeholders approved the implementation of computer-based sex education, parental consent and student assent were required. In this school district, parental consent for sex education classes is performed by exception. Parents submit written request to excuse their child from sex education curriculum. In August 2011, a letter was sent to all parents of freshman and senior students from the school district regarding current sex education and reproductive health in the school system from the school district. See Appendix E for a copy of this letter. Parents of senior students received the letter by request of the HSC. However, seniors did not receive the computer-based sex education, since they had already received the former sex education curriculum. In conjunction with the school's letter to parents, a letter was also sent regarding the Doctor of Nursing Practice (DNP) student's evidence-based practice

project. Parents had the opportunity to meet with the DNP student to discuss and review the education materials. The school mailed out both letters on August 4, 2011. Dates for these meetings were established by the HSC: August 25, 2011 and September 12, 2011. Parents that requested their child not participate in the project submitted the bottom portion of the letter to the school; see Appendix F for the letter from the DNP student. Because of some confusion with the consent by exception, twelve slips were sent back without checking the box to exclude the student. For clarification, all twelve parents were called to verify student participation. Of the twelve called, two parents never returned the phone call, and only one wanted to exclude his or her student. The two students whose parents did not return the call were excluded from the project. In addition to these two students, one parent sent back the form to exclude his or her student, and from school records four students were excluded from the project because their parent had submitted written request for his or her student not to participate in sex education. A total of eight students were excluded from the project. In addition to parental consent, it is also required to have student assent. Student assent was obtained prior to the student filling out the survey and pre-test. If the student wished to participate, he or she filled out the survey. If they did not wish to participate, they did not have to fill out the survey. Appendices A, B, C, and D all have a copy of the student assent statement. Both parental consent and student assent were required for students to participate in this EBP project.

Students accessing the surveys with pre and post-tests were controlled based upon parental consent. The eight students excluded were identified with the assistance of the biology teacher for freshman and English teacher for seniors. The surveys with pre and post-tests were anonymous and conducted through www.zoomerang.com. The school district held a subscription with zoomerang.com and allowed the DNP student to access and utilized the website for the EBP project. Access information to

www.zoomerang.com was only handed out to students whose parents gave consent by exception. However, it could not be controlled if students that were provided with the access information to zoomerang.com shared the access information with students whose parents did not provide consent by exception.

Interventions

Based on the review of literature, evidence supports a computer-based sex education intervention. During the day of October 3, 2011, freshman biology students and senior English students were given a survey with pretest. Access codes to the zoomerang.com website were handed out individually to freshmen and senior participants. They were given 15 to 20 minutes to complete the survey with pre-test. The survey with pre-test assessed current sexual behaviors and sexual knowledge.

It was then planned with the biology teachers to return the week of October 10th to implement education; however, on the morning of October 10th, the biology teachers informed the DNP student that the education modules could not be uploaded to the class website due to legal liability of unqualified teachers posting sex education material. Because students were not able to access the information, a meeting with the school's information technology (IT) department created a Moodle site specifically for sex education named reproductive health. Under the reproductive health Moodle site, the four modules were uploaded and an access code was created so that only the freshmen students could access the site. After this modification was made, the freshmen then received computer-based sex education on either October 12, 2011 or October 14, 2011. See Appendix G for an outline of the modules. After uploading the modules to the Moodle site, students needed only one 50 minute class to view the four modules. After watching the modules, students were given two pieces of paper to write down any questions for the DNP student to answer aloud to the class. Use of two pieces of paper

allowed the students to cover up the question they wrote down for anonymity. On average, each class asked at least two questions related to the modules.

Two months after the intervention, December 5, 2011, seniors received the same survey with post-test and freshmen received the same survey with post-test and two additional questions regarding their opinion of computer-based sex education. With use of the Moodle website, senior and freshmen students accessed the zoomerang.com survey with post-test via a hyperlink embedded onto the Moodle site. A password was used by students to access the Moodle site; however, control of access to this survey was conducted in the same manner as the first survey with pre-test.

Outcomes

Computer-based sex education, based upon the evidence, may increase student knowledge and may decrease high risk sexual behaviors (Bailey et al., 2010; and Portnoy et al., 2008). Student knowledge of prevention, transmission, and treatment of STIs may increase after intervention. It is possible that students may decrease high risk sexual behaviors, such as multiple sexual partners, condom use, and overall sexual activity.

Data

Literature supports a change in practice from face to face sex education to computer-based sex education. Literature reviewed included several meta-analysis articles regarding computer-based sex education interventions (Bailey et al., 2010; Noar et al., 2009; & Portnoy et al., 2008). A meta-analysis according to the hierarchy of evidence for intervention questions is level one, the highest level of evidence (Melynk & Fineout-Overholt, 2011). In conjunction with the literature, an expert in public health was utilized to facilitate the entire EBP project. Utilization of and collaboration with the HSC from the HS were used to ensure that district and state requirements were being met while formulating a curriculum that met the district's needs. To ensure that material was

age appropriate, students from other schools in the same age bracket, with parental supervision, reviewed the surveys with pre and post-tests, and the outline of educational modules. All materials were reviewed individually with these students and changes were made accordingly.

Collection of data occurred in the form of surveys with pre and post-tests. The survey with pre-test collected baseline knowledge and sexual behaviors of freshmen and senior students before the implementation of computer-based sex education administration to freshmen students. Administering the survey to senior students was requested by the HSC for evaluation of previous sex education classes. A two month follow up survey with post-test compared current knowledge to baseline knowledge as well as sexual behaviors before and after computer-based sex education implementation.

Analysis and management of the descriptive data were completed with zoomerang.com. Zoomerang.com provided descriptive analysis of data provided from the surveys with pre and post-test questions. Data collected from www.zoomerang.com were analyzed collectively. Collectively analyzing the data provided the descriptive data necessary for interpretation and significance of the project.

Protection of Human Subjects

Protection of human subjects was safeguarded by utilizing the HSC, school board, and institutional review board (IRB) from Valparaiso University. The HSC ensured that content of the outline for educational modules and surveys with pre and post-tests were all age appropriate as well as nonthreatening to students. This was also ensured by approval of the curriculum by the school board. Approval from the IRB at Valparaiso University included the certification of the DNP student by the National Institute of Health (NIH) Office of Extramural Research.

To ensure confidentiality and anonymity of participants, all surveys, as well as pre and post-tests, were anonymous. Only the DNP student had access to all data that were collected. Collection, analysis, and reporting of all data were done in the aggregate. Aggregate data are reported in this EBP project paper as well as presented to the school board and HSC.

Implementing a computer-based sex education program has a positive influence in nursing. Education is a key component in the nursing profession. Educating patients utilizing an education style that best fits their learning needs is essential. For nursing as a profession, utilization of computers to provide education to patients may increase patient knowledge of disease processes as well as compliance with care. Utilization of computer-based education is not limited to sex-education. As technology has an increasingly positive effect on society, computer-based education may be utilized in combination with face to face nursing education.

CHAPTER 4

FINDINGS

The purpose of this EBP project was to answer the PICOT question: In high school students, will two classes of comprehensive computer-based education on transmission, treatment, and prevention of sexually transmitted infections increase knowledge as well as decrease risky sexual behaviors compared to current knowledge and behaviors over a two month period? The sample was comprised of freshmen biology and senior English students from a rural Midwestern HS. Change outcomes were evaluated using descriptive statistics for analyses of data collected from the pre and post intervention survey and test facilitated by zoomerang.com. Students were informed that it was their choice to participate in the pre and post-test and survey and could opt out of answering a question.

Sample Size and Characteristics

Freshmen pre-survey: Prior to receiving the computer-based sex education, 141 freshmen completed the pre-survey and test, of which 49% (n = 75) were female and 51% (n = 77) were male, see Table 4.1. Of the freshmen class, 64% (n = 97) were 14 years of age, and 28% (n = 42) were 15 years of age. The majority of freshmen students, 86% (n = 131) recorded their ethnic background as Caucasian, 12% (n = 18) were African-American, Native American, or other, and 2% (n = 3) preferred not to specify their ethnic background; see Table 4.1. In addition to demographic information, questions inquiring about current sexual behaviors were addressed and 74% (n = 113) had never engaged in any form of sexual activity which included: oral sex, vaginal sex, or anal sex. Of the freshmen 21% (n = 31) had engaged in sexual activity of some kind and 4% (n = 6) declined to answer this question, see Table 4.1. More specifically, when

Table 4.1

Characteristics of the Freshmen Participants

	Pretest <i>n</i> (%)	Posttest <i>n</i> (%)
Grade		
Freshmen	141 (100)	149 (100)
Gender		
Male	77 (51)	78 (52)
Female	75 (49)	73 (48)
Race		
African American	8 (5)	7 (5)
Asian	0 (0)	0 (0)
Native American	3 (2)	4 (3)
White, not Hispanic	131 (86)	126 (85)
Other	7 (5)	9 (6)
Prefer not to Answer	3 (2)	3 (2)
Age of First Sexual Encounter (Oral, Anal, or Vaginal Sex)		
Never had Sex	113 (74)	112 (75)
10 yrs.	2 (1)	2 (1)
11 yrs.	0 (0)	2 (1)
12 yrs.	3 (2)	1 (1)
13 yrs.	8 (5)	7 (5)
14 yrs.	14 (9)	14 (9)
15 yrs.	5 (3)	4 (3)
18 yrs.	1 (<1)	0 (0)
Prefer not to answer	6 (4)	7 (5)

asked if they had ever engaged in vaginal or anal intercourse, 84% (n = 127) had never had intercourse, 15% (n = 23) had engaged in both vaginal or anal intercourse, and only 1% (n = 2) declined to answer the question. In the three months prior to the survey, 12% (n = 18) engaged in some form of sexual activity whereas 84% (n = 126) did not. Of those who were sexually active, in the past three months, 29% (n = 15) admitted to having had oral sex, 8% (n = 4) anal sex, and 25% (n = 13) vaginal sex. When asked how many sexual partners they had in their lifetime, 10% (n = 15) of the freshmen students had one partner, 7% (n = 10) two partners, 1% (n = 2) four partners, 3% (n = 5) five or more sexual partners, and 76% (n = 114) claimed they had not been sexually active. In the three months prior to the pre-survey, 72% (n = 108) of freshmen had never had sex; 8% (n = 12) had not had sex in the last three months; 9% (n = 14) had one sexual partner; 3% (n = 4) had two sexual partners, and 2% (n = 2) had three or more partners in the last three months. Freshmen were then asked how often they used condoms in the last three months with each sexual encounter, 80% (n = 120) never had sex; 4% (n = 6) had not had sex in the last three months; 5% (n = 7) always used condoms; 3% (n = 5) sometimes used condoms; 4% (n = 6) never used condoms, and 4% (n = 6) preferred not to answer the question. Lastly, they were asked if they practiced pregnancy prevention, 79% (n = 117) had never had sex; 8% (n = 12) used condoms; 6% (n = 9) used birth control pills; 1% (n = 1) used Depo Provera injections, and 2% (n = 3) used other.

Senior pre-survey: Prior to the freshmen receiving the computer-based sex education, 118 senior students completed the pre-survey and test, of which 48% (n = 57) were female; and 52% (n = 61) were male, see Table 4.2. Of the senior class, 74% (n = 87) were 17 years of age, and 17% (n = 20) were 18 years of age. The majority of senior students, 91% (n = 107) recorded their ethnic background as Caucasian; 8% (n = 9) were African-American, Native American, or other, and 1% (n = 1) preferred not to

Table 4.2

Characteristics of the Senior Participants

	Pretest <i>n</i> (%)	Posttest <i>n</i> (%)
Grade		
Seniors	118 (100)	112 (100)
Gender		
Male	61 (52)	56 (50)
Female	57 (48)	56 (50)
Race		
African American	2 (2)	3 (3)
Asian	0 (0)	1 (<1)
Native American	1 (1)	1 (1)
White, not Hispanic	107 (91)	96 (86)
Other	5 (4)	6 (5)
Prefer not to Answer	1 (<1)	2 (2)
Age of First Sexual Encounter (Oral, Anal, or Vaginal Sex)		
Never had Sex	36 (31)	37 (33)
10 yrs.	1 (<1)	0 (0)
11 yrs.	0 (0)	2 (2)
12 yrs.	2 (2)	0 (0)
13 yrs.	6 (5)	6 (5)
14 yrs.	18 (15)	12 (11)
15 yrs.	22 (19)	21 (19)
16 yrs.	20 (17)	17 (15)
17 yrs.	11 (9)	12 (11)
18 yrs.	1 (1)	6 (5)
Prefer not to answer	1 (1)	3 (3)

specify their ethnic background, see Table 4.2. In addition to demographic information, questions inquiring about current and past sexual behaviors were addressed, and 31% (n = 36) stated they had never engaged in any form of sexual activity which includes: oral sex, vaginal sex, or anal sex. Of the seniors, 68% (n = 81) had engaged in sexual activity of some kind, and 1% (n = 1) declined to answer this question; see Table 4.2. More specifically, when asked if they had ever engaged in vaginal or anal intercourse; 37% (n = 44) had never had intercourse; 62% (n = 73) had engaged in either vaginal or anal intercourse, and only 1% (n = 1) declined to answer the question. In the three months prior to the survey, 55% (n = 65) of senior students engaged in some form of sexual activity whereas 44% (n = 52) had not. Of those who were sexually active 69% (n = 51) admitted to having oral sex, 8% (n = 6) anal sex, and 77% (n = 57) vaginal sex. When asked how many sexual partners they had in their lifetime, 25% (n = 30) had one partner, 12% (n = 14) two partners, 10% (n = 12) three partners, 8% (n = 4) four partners, 8% (n = 10) five or more sexual partners, and 31% (n = 36) claim they had not been sexually active. In the last three months, 30% (n = 35) had never had sex; 14% (n = 16) had not had sex in the last three months; 41% (n = 48) had one sexual partner; 10% (n = 12) had two sexual partners, and 5% (n = 6) had three or more partners in the last three months. Seniors were then asked how often condoms were used in the last three months with each sexual encounter, 35% (n = 41) had never had sex; 9% (n = 10) had not had sex in the last three months; 26% (n = 31) always used condoms; 13% (n = 15) sometimes used condoms; 15% (n = 18) never used condoms, and 2% (n = 2) did not want to answer the question. Lastly, they were asked if they practiced pregnancy prevention, 36% (n = 42) had never had sex; 32% (n = 38) used condoms; 22% (n = 26) used birth control pills; 15% (n = 17) used Depo Provera injections, and 7% (n = 8) used other.

Freshmen post-survey: Two months after receiving the computer-based sex education, 151 freshmen completed the post-survey, of which 48% (n = 73) were female and 52% (n = 78) were male, see Table 4.1. Of the freshmen class, 58% (n = 87) were 14 years of age, and 37% (n = 55) were 15 years of age. The majority of freshmen, 85% (n = 126), recorded their ethnic background as Caucasian; 13% (n = 20) were African-American, Native American, or other, and 2% (n = 3) preferred not to specify their ethnic background, see Table 4.1. In addition to demographic information, questions regarding sexual behaviors over the last two months, October and November, were addressed, and 75% (n = 112) had never engaged in any form of sexual activity which included: oral sex, vaginal sex, or anal sex. Of the freshmen 20% (n = 30) had engaged in sexual activity of some kind, and 5% (n = 7) declined to answer the question, see Table 4.1. More specifically, when asked if they had engaged in vaginal or anal intercourse, 81% (n = 120) had never had intercourse; 14% (n = 21) had engaged in either vaginal or anal intercourse, and 5% declined to answer the question. In the months of October and November, after the intervention, 11% (n = 17) engaged in some form of sexual activity whereas 85% (n = 127) had not. Of those who were sexually active 16% (n=8) admitted to having had oral sex, 4% (n = 2) anal sex, and 27% (n = 13) vaginal sex. When asked how many sexual partners they had in their lifetime, 9% (n = 13) had one partner, 5% (n = 8) two partners, 1%, (n = 1) three partners, 1% (n = 2) four partners, 2% (n = 3) five or more sexual partners, and 76% (n = 111) claim they had never been sexually active. In October and November, 75% (n = 110) had never had sex; 10% (n = 14) had not had sex in October and November; 10% (n = 14) had one sexual partner; 2% (n = 2) had two or more sexual partners in October and November. Freshmen were then asked how often condoms were used in October and November with each sexual encounter, 78% (n = 114) had never had sex; 7% (n = 10) had not had sex in October or November; 5% (n = 8) always used condoms; 2% (n = 3) sometimes used condoms; 5% (n = 7) never

used condoms, and 3% (n = 4) did not want to answer the question. Lastly, they were asked if they practiced pregnancy prevention, 77% (n = 110) had never had sex; 8% (n = 11) used condoms; 5% (n = 7) used birth control pills; 1% (n = 2) used Depo Provera injections, and 1% (n = 2) used other.

Senior post-survey: Two months after the freshmen received the computer-based sex education, 112 seniors completed the post-survey and test to compare sexual activity, of which 50% (n = 56) were female and 50% (n = 56) were male, see Table 4.2. Of the senior class, 62% (n = 70) were 17 years of age, and 34% (n = 38) were 18 years of age. The majority of senior students, 86% (n = 96), recorded their ethnic background as Caucasian; 12% (n = 13) were African-American, Native American, or other, and 2% (n = 2) preferred not to specify their ethnic background, see Table 4.2. In addition to demographic information, questions inquiring about current sexual behaviors as well as over the last two months, October and November, were addressed, and 29% (n = 32) had never engaged in any form of sexual activity which includes: oral sex, vaginal sex, or anal sex. Of the seniors 68% (n = 76) had engaged in sexual activity of some kind and 3% (n = 3) declined to answer this question, see Table 4.2. More specifically, when asked if they had engaged in vaginal or anal intercourse; 33% (n = 37) had never had intercourse; 63% (n = 70) had engaged in both vaginal or anal intercourse, and 4% (n = 4) declined to answer the question. In October and November, 52% (n = 58) engaged in some form of sexual activity whereas 45% (n = 50) did not. Of those who were sexually active; 59% (n = 41) admitted to having had oral sex, 6% (n = 4) anal sex, and 68% (n = 47) vaginal sex. When asked how many sexual partners they had in their lifetime, 21% (n = 24) had one partner, 19% (n = 21) two partners, 7% (n = 8) three partners, 8% (n = 9) four partners, 11% (n = 12) five or more sexual partners, and 30% (n = 34) claim they had not been sexually active. In October and November, 31% (n = 35) of senior students had never had sex, 13% (n = 15) had not had sex in October or November; 43% (n = 48)

had one sexual partner; 4% (n = 4) had two sexual partners, and 5% (n = 5) had three or more partners in October and November. Seniors were asked how often condoms were used in October and November with each sexual encounter; 33% (n = 37) had never had sex; 14% (n = 16) had not had sex in October or November; 23% (n = 26) always used condoms; 10% (n = 11) sometimes used condoms; 15% (n = 17) never used condoms, and 4% (n = 4) declined to answer the question. Lastly, they were asked if they practiced pregnancy prevention; 34% (n = 37) had never had sex; 29% (n = 32) used condoms; 22% (n = 24) used birth control pills; 13% (n = 14) used Depo Provera injections, and 6% (n = 7) used other.

Changes In Outcomes

Freshmen Pre and Post Test. In addition to a pre-survey, the freshmen were administered a seven question true and false test that assessed knowledge prior to the educational intervention. Two months after the educational intervention, freshmen were then administered the same seven question true and false test, along with two added questions assessing their preference of computer-based sex education to traditional face-to-face sex education. See Appendices A and B, for the pre and post-test questions. In analyzing each question of the freshmen pre-test, correct answers ranged from 52% to 69% (See Figure 4.1). Analysis of each question on the post-test was completed and the percentage of correct answers ranged from 69% to 91%. See Figure 4.1 for a comparison of the freshmen pre and post-test.

Senior Pre and Post Test. Although the seniors did not receive education intervention of computer-based sex education, by request of the HSC, seniors participated in the pre and post survey and test. Seven true and false questions, the same questions as the freshmen pre-test, were administered to the seniors in October and December, see Appendix B. In analyzing each question of the senior pre-test, correct answers ranged from 51% to 90% compared to the post-test; correct answers

ranged from 62% to 89%. See Figure 4.2 to see the comparison of the seniors' post-test to the freshmen post-test.

Figure 4.1

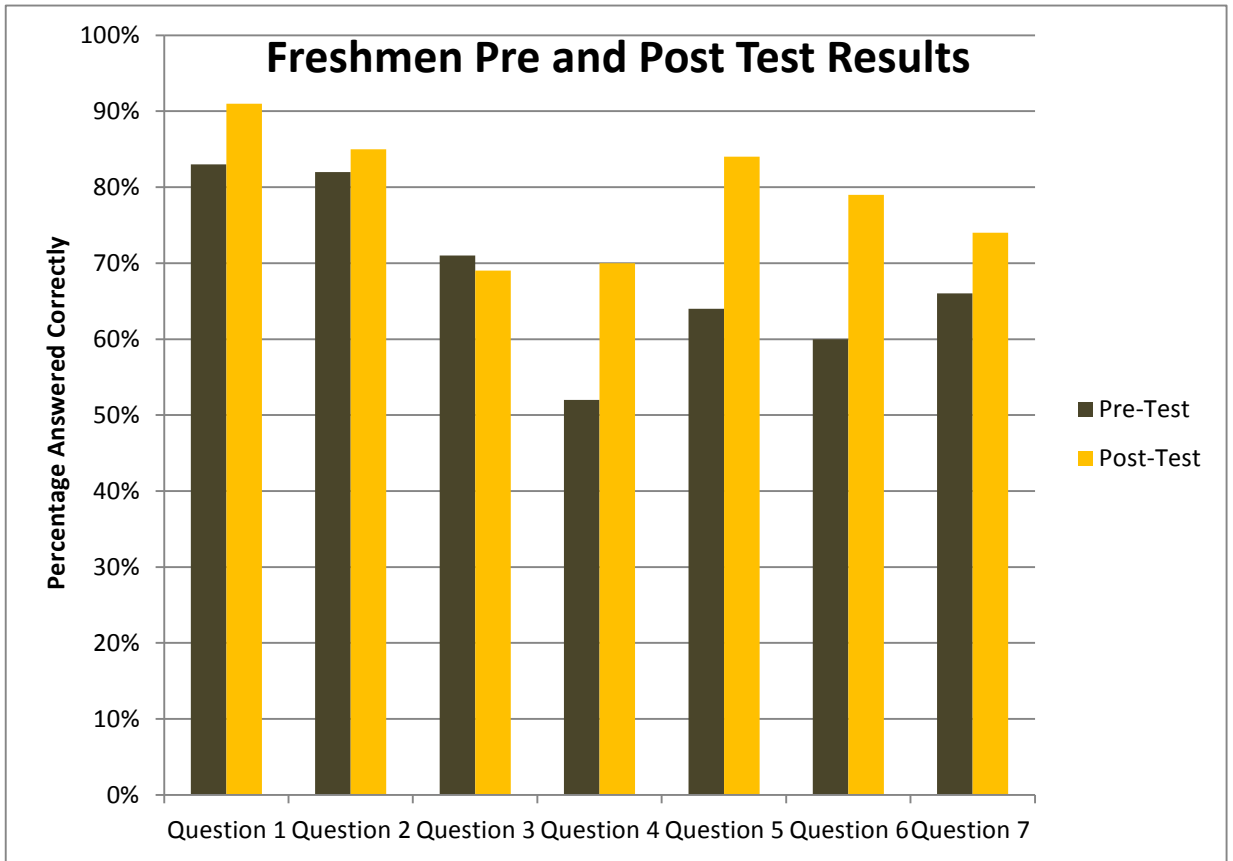
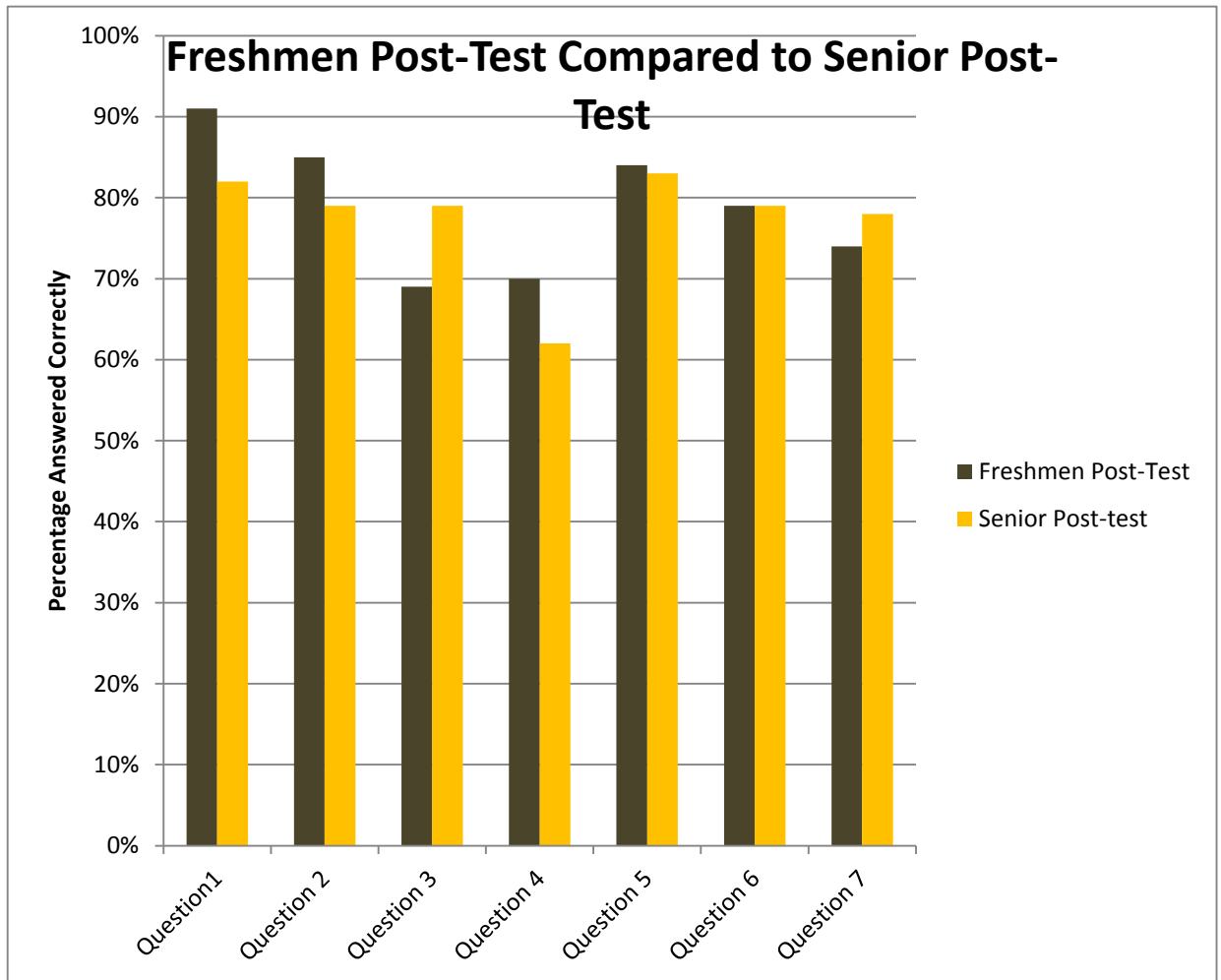


Figure 4.2



Secondary Outcome. Freshmen answered additional questions on the post-test to measure a secondary outcome of student preference of sex education modality. On the post-test 40% (n = 59) of freshmen preferred learning about sex education on their laptop, and 45% (n = 67) did not care how sex education would be administered. In the other additional question, 18% (n = 26) preferred face-to-face sex education; 35% (n = 52) preferred computer-based sex education, and 47% (n = 70) do not have a preference.

Data collected for this project was done so using the pre, post-test with survey method through zoomerang.com, with the intention of answering the PICOT question: In

high school students, will two classes of comprehensive computer-based education on transmission, treatment, and prevention of sexually transmitted infections increase knowledge as well as decrease risky sexual behaviors compared to current knowledge and behaviors over a two month period? Descriptive analyses of data were executed to present, as well as compared the pre and post survey and test data collected. In Chapter 5, an explanation of the analyses findings will be discussed.

CHAPTER 5

DISCUSSION

The purpose of this EBP project was to increase HS students' knowledge of STI and decrease risky sexual behaviors by changing the current modality of sex education to computer-based sex education based upon the evidence. This chapter provides an explanation of the project findings from Chapter 4, evaluates the theoretical framework utilized to guide the project, reflects upon the strengths and limitations of the project, and discusses implications for the future.

Explanations of Findings

Data were collected utilizing zoomerang.com in the form of pre and post-surveys with tests. Analyses of the descriptive statistics from the pre and post-surveys with tests were completed utilizing zoomerang.com. Data collection and analyses specifically examined HS students' sexual behaviors over a two month period as well as knowledge after the implementation of computer-based sex education in freshmen biology classes.

Sexual behaviors. Collection of data on sexual behaviors occurred utilizing the survey method through zoomerang.com. Questions regarding sexual practices including age of first sexual encounter, age of first sexual intercourse, number of lifetime sexual partners, number of partners in the past two to three months, condom use, and pregnancy prevention methods were asked.

Freshmen pre and post-survey. Distribution of males to females were consistent from pre and post-survey with 51% (n = 77) to 52% (n = 78) males compared to 49% (n = 75) to 48% (n = 73) females. Total participation was N = 152 during the pre-survey, and N = 151 for the post-survey. The shift in male to female distribution as well as total number of participants was affected by student absences on the days in which the surveys were administered. Consistent with both surveys the majority of freshmen,

92% on pre-survey and 95% on post-survey, were 14 or 15 years of age as well as Caucasian, 86% on pre-survey and 85% on post-survey. The majority of the participants were Caucasian which was consistent with the county statistics (U.S. Census Bureau, 2012). The pre and post-surveys were consistent with 74% to 75% of freshmen participants stating they have never engaged in oral, vaginal, or anal sex. Resistance to sex education in schools from parents is typically due to parents assuming sex education will increase sexual behaviors among students (Noar et al., 2009). Based upon the results of the pre and post survey, there was no change in the number of freshmen who engaged in vaginal or anal sex in their lifetime and a 1% reduction in the number of freshmen who have had sex in the two months following the computer-based sex education compared to the three months prior to the pre survey. The majority of those who engaged in sexual activity in the three months before the pre-survey and the two months in-between the intervention and post-survey preferred not to specify between oral, anal, or vaginal sex; however, the majority of those who choose to delineate among oral, anal, or vaginal sex, engaged in oral or vaginal sex. Engaging in sexual activity with multiple partners increases the probability of acquiring and transmitting STIs and is considered high risk sexual behaviors. On the pre and post-survey, not all participants answered the questions that inquired about the number of sexual partners in their lifetime or in the past two to three months, and 3 to 6% answered they preferred not to answer the question. But, 1% to 3% ($n = 1$ to 5) of freshmen, 14 to 15 year olds, have had five or more sexual partners in their lifetime or the past two to three months. Of the sexually active freshmen, only 5% always use a condom, and 4% responded they never use a condom. From pre-survey to post-survey, there was a 1% increase in freshmen that never use condoms when engaging in sexual activity; however, the number of freshmen that were not sexually active within the three months prior to the survey included 78% ($n = 114$) compared to 80% ($n = 120$) during the two

months post education on the post survey. These findings are consistent with research conducted by Lightfoot et al. (2007) in that providing computer-based education reduces sexual activity in the months after completing computer-based sex education. Deficient condom use may be directly related to lack of accessibility to condoms, since the HS is in a rural area, or the lack of funds to buy condoms. Receiving computer-based sex education did not increase the incidence of sexual activity among freshmen, but the education also did not increase the incidence of condom use among those students who are sexually active.

Freshmen surveys compared to senior surveys. Upon request of the HSC, seniors also participated in the pre and post-surveys. The HSC wanted to compare sexual activity and knowledge of freshmen and seniors. Seniors did receive face-to-face sex education as freshmen in their physical education class. When comparing the findings of sexual activity between the freshmen and senior students, findings were not unexpected: 29% of seniors have never engaged in sexual activity compared to 75% of freshmen who have never engaged in sexual activity. The astonishing findings were regarding condom use among those who are sexually active: 15% of seniors never use condoms with sexual encounters, which is 10% higher than freshmen who are sexually active and never use condoms based upon the post-survey. The significant increase in lack of condom use among seniors may be caused by lack of accessibility to condoms or may be from lack of knowledge among seniors of STIs, since they have not received sex education in the past three years. In addition to a decrease in condom use among the seniors, 11% (n = 12) have had five or more sexual partners in their lifetime compared to 2% (n = 3) of freshmen. Both freshmen and seniors have been exposed to some kind of sex education and some continue to engage in high risk sexual behaviors and not protect themselves against STIs. Increase in high risk sexual behaviors from freshmen to senior year may warrant an additional HS sex education course after freshmen year.

Knowledge. Evaluation of knowledge was conducted through zoomerang.com with a pre and post-test. Freshmen and seniors were asked the same seven questions on the pre-test, prior to the freshmen receiving sex education, and the post-test two months after the sex education with answer options of “true”, “false”, or “I do not know”. Analysis of the descriptive statistics was completed through zoomerang.com.

Freshmen pre-test compared to post-test. The pre and post-tests allowed students to answer “true”, “false”, and “I do not know”. Students were provided with the option to answer “I do not know” to prevent them from guessing an answer to a question. A consistent theme from pretest to post-test on each question was the reduction by at least 2% and up to 18% of the response “I do not know” from freshmen, which leads to the assumption that freshmen increased knowledge from the computer-based sex education. In addition to the reduction of *I do not know* responses, six of the seven questions had a 3% to 20% increase in correct responses from students. One question had a 2% decrease in the number of correct answers from students, but also a 10% reduction in “I do not know” responses from students. The question was: “You cannot get a sexually transmitted infection from anal (butt) sex. (Chlamydia, Gonorrhea, HIV, AIDS).” Based upon the results of the six other questions, it may warrant a revision of this question because students may have had a difficult time understanding the question. Findings of this project are consistent with the evidence provided by Bailey et al. (2010), Ito et al. (2008), and Roberto et al. (2007), in that computer-based sex education supports the increase in student knowledge regarding sexual health.

Freshmen post-test compared to senior post-test. On four of the seven questions from the post-test, there was a 1% to 9% increase in the number of freshmen students that answered the question correctly compared to the seniors. On one question, 79% of the freshmen and seniors answered the question correctly. But, on another question, there was a 10% increase in the number of seniors that answered the

question correctly compared to the freshmen. Congruently, it is the same question in which the freshmen had a decrease in knowledge of from the pre to post test. Again, this may be due to the wording of the question for freshmen students. The increase of freshmen knowledge may be contributed to the recent computer-based sex education. Providing sex education for students as juniors or seniors may be warranted based upon these findings; to function as a refresher course to junior or senior students to reinforce not only the knowledge of reproductive health, but also to provide insight into high risk sexual behaviors. When reviewing the literature, peer-led sex education in combination with computer-based sex education provided students with increased knowledge as well as a reduction in high risk sexual behaviors. A study conducted by O'Hara, Messick, Fichtner, & Parris (1996), provided peer-led sex education to HS students with results that reflected an increase in condom use as well as peer to peer discussions regarding HIV/AIDS, with increased satisfaction from students with peer-led education. Combining computer-based sex education with peer-led small discussion groups may improve high risk sexual behaviors as well as reinforce knowledge.

Preference of Sex Education Modality. Based upon the findings in the literature from Keller and LaBelle (2005) and Ito et al. (2008) that computer-based sex education is preferred, the freshmen were asked two questions on the post-test regarding their preference of sex education modality. When asked if they preferred learning about sex education on their laptops with ear buds, 40% agreed; 15% disagreed, and 45% responded it does not matter. They were then asked if they preferred face-to-face or computer-based sex education, 18% preferred face-to-face, 35% computer-based, and 47% did not have a preference. These findings are consistent with the evidence by Keller and LaBelle (2005) and Ito et al. (2008), in that computer-based sex education is preferred over face-to-face; however, the majority of the freshmen do not have preference on the modality of sex-education administration. In

conjunction with these findings, computer-based sex education is the preference of the HS because of the increased costs of sending a teacher for sex-education certification or contracting an outside source to provide sex-education.

Overall, the findings of this EBP project answered the PICOT question. Freshmen did have an increase in knowledge regarding their sexual health as well as a decrease or no change in high risk sexual behaviors. Condom use did not improve from pre to post survey, but this may be due to lack of accessibility or lack of education on condom use. Demonstration of proper condom use was against the policy of the school participating in this EBP project, and distributing condoms in high schools in this Mid-Western state is not allowed unless the school has a health clinic. A health clinic within the school is not feasible due to funding, but demonstration of proper condom use may be negotiable with the school board and HSC.

Evaluation of the Applicability of the Theoretical and EBP Framework

Two frameworks guided the development, implantation, and analysis of this EBP project: the nursing theory Modeling, Role-Modeling and the EBP model for change. An evaluation of the applicability of each framework will be completed in this section.

Modeling, role-modeling. Erickson et al. (1983) MRM nursing theory served as the theoretical framework guide for this EBP project. Utilization of the MRM theory for this project allowed the DNP student to provide unconditional acceptance, nurturance, and facilitation with every encounter with the students. Students modeled their world for the DNP student through their environment, adaptation, and self-care knowledge and resources with the goal to achieve self-care action, which included optimal health status or holism. Based upon the DNP student's assessment of the students' environment, technology based education is the preferred modality of education. Technology based education was provided to students with individual lap top computers from the school district. Each student possessed the knowledge and skills to navigate a computer.

Adaptation from a face to face led sex education course to a computer-based sex education course for students occurred without resistance or change in the environment of the students. Students were provided with nurturance and facilitation by the DNP student during the pre and post-test and survey, as well as during the computer-based sex education with an open environment to ask questions or laugh if uncomfortable with the sensitive information discussed. Self-care knowledge was assessed through the pre and post-test and surveys. Students did achieve self-care knowledge by improvement on pre and post-test scores; however, utilization of self-care resources and action were not achieved with computer-based education. Students continue to engage in high risk sexual behaviors, specifically, lack of condom use. Further education is necessary in order for the students to achieve self-care action.

Application of the MRM theory for this project, served as a suitable theory to guide this EBP project. A change in the modality of sex education occurred through role-modeling the world of the students. Role-modeling the world of the students provided minimal change to the environment and adaption by the students to improve self-care knowledge and action with minimal stressors, a strength to the theory. However, self-care action, optimal health, was not achieved; even though the students increased knowledge of their sexual health, they continued to engage in high risk sexual behaviors. A weakness to the utilization of the MRM theory, for this project, was that the goal of self-care action with optimal health status was not met, because students have the free will to choose whether or not they want to achieve self-care action with optimal health status.

EBP model for change. The EBP model for change provided a six step process to guide this EBP project (Fineout-Overholt & Stillwell, 2011). Step one included the assessment for a change in practice based upon the increased STI rates in the rural Midwestern County. Based on the increased rates of STIs, step two, a search for the

best-evidence from the literature occurred, using Melynk and Fineout-Overholt (2011) levels of evidence. The literature search found computer-based sex education to be an effective modality to provide sex education. Critical appraisal of the evidence discovered in step three, utilizing Melynk and Fineout-Overholt's (2011) critical analysis of evidence. Based upon the evidence, a design for a change in practice was developed in step four along with collaboration with key stakeholders, the school board, and HSC. After collaboration with key stakeholders, as well as development of the computer-based sex education modules, step five, implementation of the computer-based sex education occurred in October 2011 with administration of a pre-test and survey prior to the education. Initially, it was assumed two days of education would be provided to cover the material; however, one day of education proved sufficient to administer the education modules, as well as answer questions from students. Two months after computer-based sex education was provided, a post-test and survey were administered to assess knowledge and sexual behaviors of the freshmen students. Analysis of the descriptive data collected on the pre and post-test and surveys occurred through zoomerang.com. Based upon the simplicity of administration of a computer-based sex education curriculum that has already been developed, step six, incorporating and maintaining the changes made with this project can occur with minimal resources from the school. Annual administration of the computer-based sex education can occur in freshmen biology classes with the assistance of the school nurse, who can also answer any questions that may arise from the educational material.

The EBP model for change served as an effective framework to guide this EBP project. Each step of the model provided a guide to ensure the DNP student met all requirements for an EBP project, as well as a guide to prevent being overwhelmed with the EBP process. A weakness of the EBP model for change is the final step of incorporating and maintaining the change. Incorporating and maintaining a change in

practice takes, at times, years to achieve. For this project report, one can only speculate that the school will be able to incorporate and maintain computer-based sex education. An additional weakness is the absence of key stakeholders. Inclusion of key stakeholders for an EBP project can prevent resistance to a change because changes will be made in collaboration with those most significantly influenced by the change. Including all key stakeholders will be the most significant modification made if the EBP project is repeated. As previously mentioned, the school board and HSC were included in the project; however, the biology teachers and IT department were not included in the development or implementation of the project. Both of whom were key stakeholders in implementation of this project.

Strengths and Limitations of EBP Project

Strengths. Implementation of computer-based sex education in this rural Midwestern HS was effective because of the overwhelming support from the school board, HSC, and the community. Based upon the overwhelming support, it is highly probable the school will continue with computer-based sex education in the HS. To be in compliance with the State of MI, school districts must report the knowledge acquired from sex education; utilization of a pre-test and post-test for this project provided the school with data that can generate the report necessary to meet state requirements. Michigan also requires STI and HIV/AIDS education at least one time in HS; implementing these computer-based sex education modules allows compliance from the school with state requirements. It was estimated that two class periods would be needed to provide the computer-based sex education; however, one class period was more than sufficient to deliver computer-based sex education. Overall, the effort to implement and maintain computer-based sex education is minimal, and it is more than feasible for the school to continue.

Limitations. Limitations of the project came from lack of communication and design of the study. A lack of direct communication occurred with the biology teachers and IT department. Communication for the project was directed through the HS principal and HSC. The HSC committee communicated directly to the school board and effectively obtained school board approval. However, communication with the biology teachers was conducted through the HS principal. By using the principal as the middle man of communication, the DNP student was not aware of the concerns and needs of the biology teachers related to distribution of the sex education material. The biology teachers did not feel comfortable placing the sex education modules on their classroom Moodle sites. One day prior to implementation, the DNP student became aware of the concern when speaking directly with the biology teachers. It was at this point that the DNP student also became aware of the lack of communication with the IT department. In one day, the DNP student met with the IT department to develop a Moodle site specifically for reproductive health and had to rerecord all four education modules, so that the modules would adapt to Moodle. Utilization of an IT department is essential to implementing any computer-based project and earlier utilization of the IT department may have been beneficial to make the computer-based sex education modules interactive for students.

In addition to lack of communication, project design of the pre and post-test and surveys caused limitations to the project. Data were collected in the aggregate. Evaluation of the pre and post-test and surveys, examined the freshmen class collectively, as well as the senior class collectively. Aggregate data provides an overall evaluation of the pre and post-test and surveys, but it has limitations. Attrition rates could not be accurately assessed due to only having aggregate data. The freshmen class had one less participant from the pre to post-test and survey, whereas the senior class had six less participants from the pre to post-test and survey. However, it is impossible to

know which students were absent on the day of the pre-test and survey, or absent on the post-test and survey. So, some students may have completed the pre-test and survey and not the post-test and survey, or vice-versa. It is recommended for future projects to design the pre and post-test and survey, so that a paired *t*-test may be completed to improve accuracy of attrition rates.

Based upon the PICOT question, two days of computer-based sex education were to be administered. But, only one day of computer-based education was delivered to freshmen students. Whereas this may be seen as a strength because it does not take away from the biology class curriculum, it does not answer the PICOT question. Not complying with goals set forth in the PICOT question is a limitation to this project.

Implications for the Future

Practice. Implementation of computer-based sex education in schools will change current practices of school based nurses. School based nurses may be licensed practical nurses, registered nurses, or APNs; regardless of the licensure of the nurse, computer-based sex education can be utilized to improve students' knowledge of their sexual health. Utilization of the IT department within the school district, can aid the nurse in the development and distribution of computer-based sex education. Computer-based sex education can be delivered without the physical presence of the school based nurse. Not having to be physically present to deliver education will allow the nurse to continue with daily tasks and job responsibilities. Initially, development and production of computer-based modules may be time consuming, but in time less time will be required of the school based nurse.

Theory. Use of computer-based sex education may improve student knowledge, decrease high risk sexual behaviors, or over time reduce the incidence of STIs. The MRM nursing theory was applicable to this project, but reaching the end goal of self-care action is difficult to achieve when measuring increased knowledge and high risk sexual

behaviors. MRM theory is a grand theory that encompasses multiple middle range theories (Erickson et al., 1983). Future development of a practice theory which encompasses the concepts, of the MRM theory may be warranted. The utilization of an empirical theory, with the concepts of the MRM theory, would be practical with EBP.

Research. Based upon the ROL, research has been conducted on computer-based sex education. However, more research is warranted, specifically regarding computer-based sex education for HS students. When the ROL was conducted, implications of computer-based sex education with peer-led sex education or administration of computer-based sex education to all female and all male classes were not found. Future research using these implications as well as the effect of computer-based sex education will assist APN and DNP with implementation of EBP and best practice guidelines.

Education. Future education implications of computer-based sex education should include school based nurses, school boards, and school HSCs. School based nurses should be educated with the empirical evidence of improving student knowledge and satisfaction with computer-based sex education. School boards, specifically in this rural Midwestern County should be educated on the benefits, financially and academically, of computer-based sex education. Over time, utilization of computer-based sex education programs that are developed by a licensed healthcare professional can decrease costs and time for reproductive health educators.

Conclusion

Computer-based sex education was provided to freshmen biology students in a rural Midwestern HS. Freshmen and senior students completed a pre and post-test with survey, prior to the freshmen receiving computer-based sex education and then two months after the education. MRM nursing theory and the EBP model for change guided the development, implementation, and analysis of this project. Freshmen students

increased knowledge of sexual health and did not have an increase in sexual activity within the two months after computer-based sex education. However, freshmen did not decrease high risk sexual behaviors with an increase in condom use. Continued work with EBP within this HS is warranted, specifically with use of peer-led sex education in combination with computer-based sex education.

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BIOGRAPHICAL MATERIAL**Ashley Jones**

Ashley Jones is in the first class of Bachelor of Science in Nursing (BSN) to Doctor of Nursing Practice (DNP) program students to graduate from Valparaiso University. Following in her parent's footsteps, Ashley graduated with her associate degree in nursing (ADN) in 2004 from Kellogg Community College. During the first year of her nursing career, she worked on a medical, surgical floor as a staff nurse and charge nurse. With the experience gained in her first year, she set out on a journey of travel nursing around the country (Hawaii, Boston, San Diego, Dallas, Wichita, and Ann Arbor). Travel nursing provided valuable experiences and skills not only as a medical surgical nurse, but also as a cardiac, emergency room, critical care, and her personal favorite IV therapy at Boston Children's Hospital and University of Michigan Medical Center. Gaining these experiences encouraged Ashley to continue with her education. May of 2009, she graduated from Robert B. Miller College in Battle Creek, MI with her BSN. Throughout her nursing career she has been on multiple medical mission trips to Mexico and volunteered at the prescription drug access program in Calhoun County, MI. While in the DNP program she joined the MidWest Nursing Research Society, and presented a poster presentation of her evidence based practice project, *Computer-Based Sex Education for High School Students*, at the annual conference in Dearborn, MI. After graduation, Ashley hopes to extend her computer-based sex education program throughout all of the public high schools in her county, as well as begin practicing as a family nurse practitioner in a community health center setting.

ACRONYM LIST

AIDS: Acquired Immune Deficiency Syndrome

CBI: Computer Based Intervention

CD-ROM: Compact Disc-Read Only Memory

CDC: Center for Disease Control

CINAHL: Cumulative Index of Nursing and Allied Health

EBP: Evidence Based Practice

ERIC: Education Resources Information Center

HIV: Human Immunodeficiency Virus

HS: High School

HSC: Human Sexuality Committee

HPV: Human Papilloma Virus

IRB: Institutional Review Board

IT: Information Technology

MDCH: Michigan Department of Community Health

MI: Michigan

MRM: Modeling, Role-Modeling

PICOT: Population Intervention Comparison Outcome Time

RCT: Randomized Control Trial

ROL: Review of Literature

SMD: Standardized Mean Difference

STD: Sexually Transmitted Disease

STI: Sexually Transmitted Infection

US: United States

APPENDIX A

Freshmen Pre-Test and Survey

Freshmen Sex Education Pre-Survey and Test By filling out this survey and test, you (the student) are agreeing to take part in this evidence based project. This project provides computer-based sex e



Results Overview

Date: 4/4/2012 5:47 AM PST
 Responses: Completed
 Filter: No filter applied

1. What grade are you in?

9th grade (Freshman)		141	100%
12th grade (Senior)		0	0%
Total		141	100%

2. Are you male or female?

Female		75	49%
Male		77	51%
Total		152	100%

3. How old are you?

13 years old		8	5%
14 years old		97	64%
15 years old		42	28%
16 years old		4	3%
17 years old		1	1%
18 years old		0	0%
19 years old		0	0%
Total		152	100%









4. What is your race?

White (Caucasian)		131	86%
Black (African American)		8	5%

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Asian		0	0%
Native American		3	2%
Pacific Islander		0	0%
Other		7	5%
I do not want to say		3	2%
Total		152	100%

5. How old were you when you became sexually active? (This includes oral (mouth) sex, vaginal sex, and anal (butt) sex)




I have not had oral (mouth) sex, vaginal sex, or anal (butt) sex		113	74%
10 years old		2	1%
11 years old		0	0%
12 years old		3	2%
13 years old		8	5%
14 years old		14	9%
15 years old		5	3%
16 years old		0	0%
17 years old		0	0%
18 years old		1	1%
I do not want to answer		6	4%
Total		152	100%

6. At what age did you first have sexual intercourse? (vaginal or anal sex)





I have not had sexual intercourse.		127	84%
11 years old		2	1%
12 years old		3	2%
13 years old		1	1%
14 years old		10	7%
15 years old		6	4%
16 years old		0	0%
17 years old		1	1%
18 years old		0	0%
I do not want to answer		2	1%

Total	152	100%
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



7. Have you been sexually active within the last three months? (This includes oral (mouth), vaginal, and anal (butt) sex.)

Yes		18	12%
No		126	84%
I do not want to answer		6	4%
Total		150	100%






8. If you answered "yes" in question 7, please check all that apply.

Oral		15	29%
Anal		4	8%
Vaginal		13	25%
I do not want to answer		33	65%

9. How many sexual partners have you had in your lifetime? (This includes oral (mouth), vaginal, and anal (butt) sex.)







I have not had any sexual partners.		114	76%
1		15	10%
2		10	7%
3		0	0%
4		2	1%
5 or more		5	3%
I do not want to answer.		4	3%
Total		150	100%

10. How many sexual partners have you had in the last three months? (This includes oral (mouth), vaginal, and anal (butt) sex.)






I have never had any form of sex.		108	72%
I have not had any form of sex in the last three months.		12	8%
1		14	9%
2		4	3%
3		1	1%

4		0	0%
5 or more.		1	1%
I do not want to answer.		9	6%
Total		149	100%

11. In the last three months, how often did you or your partner use a condom (a rubber)?

I have never had sex.		120	80%
I have not had sex in the last three months.		6	4%
Always		7	5%
Sometimes		5	3%
Never		6	4%
I do not want to answer.		6	4%
Total		150	100%

12. In the last three months, what have you used to prevent pregnancy when having sex? Please circle all that apply.

I have never had sex.		117	79%
I have not had sex in the last three months.		8	5%
Condoms		12	8%
Birth control pills		9	6%
Depo Provera Injections (shots)		1	1%
Other		3	2%
I do not want to answer.		7	5%

13. Having sex includes vaginal sex, anal (butt) sex, and oral (mouth) sex.

True		125	83%
False		6	4%
I do not know.		20	13%
Total		151	100%

14. You can get sexually transmitted infections from oral sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		122	82%
False		11	7%
I do not know.		15	10%
Total		148	100%

15. You cannot get sexually transmitted infections from anal (butt) sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		15	10%
False		107	71%
I do not know.		28	19%
Total		150	100%

16. Human papilloma virus (HPV or warts) can cause throat cancer from oral sex.

True		77	52%
False		14	9%
I do not know.		58	39%
Total		149	100%

17. If someone has herpes simplex virus (herpes) on his or her mouth, during oral sex it can be passed on to the vagina or penis.

True		98	64%
False		11	7%
I do not know.		43	28%
Total		152	100%

18. Most people with chlamydia or gonorrhea do not even know they have it. They do not feel sick.

True		91	60%
False		14	9%
I do not know.		46	30%
Total		151	100%

19. Not having sex is the only way to make sure you do not get a sexually transmitted infection.

True		100	66%
False		27	18%
I do not know.		24	16%

APPENDIX B

Freshmen Post-Test and Survey

Freshmen Sex Education Post-Survey and Test
Results Overview



Date: 4/4/2012 5:53 AM PST
Responses: Completes
Filter: No filter applied

1. What grade are you in?

9th grade (freshman)		149	100%
12th grade (Senior)		0	0%
Total		149	100%

2. Are you male or female?

Female		73	48%
Male		78	52%
Total		151	100%

3. How old are you?









13 years old		1	1%
14 years old		87	58%
15 years old		55	37%
16 years old		6	4%
17 years old		1	1%
18 years old		0	0%
19 years old		0	0%
Total		150	100%

4. What is your race?

White (Caucasian)		126	85%
Black (African American)		7	5%
Asian		0	0%
Native American		4	3%
Pacific Islander		0	0%
Other		9	6%

I do not want to say		3	2%
Total		149	100%

5. How old were you when you became sexually active? (This includes oral (mouth) sex, vaginal sex, and anal (butt) sex)

I have not had oral (mouth) sex, vaginal sex, or anal (butt) sex		112	75%
10 years old		2	1%
11 years old		2	1%
12 years old		1	1%
13 years old		7	5%
14 years old		14	9%
15 years old		4	3%
16 years old		0	0%
17 years old		0	0%
18 years old		0	0%
I do not want to answer		7	5%
Total		149	100%

6. At what age did you first have sexual intercourse? (vaginal or anal sex)

I have not had sexual intercourse.		120	81%
11 years old		3	2%
12 years old		1	1%
13 years old		6	4%
14 years old		8	5%
15 years old		3	2%
16 years old		0	0%
17 years old		0	0%
18 years old		0	0%
I do not want to answer		7	5%
Total		148	100%

7. Have you been sexually active in October and November? (This includes oral (mouth), vaginal, and anal (butt) sex.)

Yes		17	11%
No		127	85%
I do not want to answer		6	4%
Total		150	100%

8. If you answered "yes" in question 7, please check all that apply.

Oral		8	16%
Anal		2	4%
Vaginal		13	27%
I do not want to answer		33	67%

9. How many sexual partners have you had in your lifetime? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have not had any sexual partners.		111	76%
1		13	9%
2		8	5%
3		1	1%
4		2	1%
5 or more		3	2%
I do not want to answer.		9	6%
Total		147	100%

10. How many sexual partners have you had in October and November? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have never had any form of sex.		110	75%
I have not had any form of sex in October and November		14	10%
1		14	10%
2		1	1%
3		0	0%
4		0	0%
5 or more.		1	1%
I do not want to answer.		7	5%

Total	147	100%
-------	-----	------

11. In October and November, how often did you or your partner use a condom (a rubber)?

I have never had sex.		114	78%
I have not had sex in October and November.		10	7%
Always		8	5%
Sometimes		3	2%
Never		7	5%
I do not want to answer.		4	3%
Total		146	100%

12. In October and November, what have you used to prevent pregnancy when having sex? Please circle all that apply.

I have never had sex.		110	77%
I have not had sex in October and November.		14	10%
Condoms		11	8%
Birth control pills		7	5%
Depo Provera Injections (shots)		2	1%
Other		2	1%
I do not want to answer.		10	7%

13. Having sex includes vaginal sex, anal (butt) sex, and oral (mouth) sex.

True		135	91%
False		3	2%
I do not know.		10	7%
Total		148	100%

14. You can get sexually transmitted infections from oral sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		125	85%
False		10	7%
		12	8%

I do not know.			
		Total	147 100%

15. You cannot get sexually transmitted infections from anal (butt) sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		32	22%
False		101	69%
I do not know.		13	9%
		Total	146 100%

16. Human papilloma virus (HPV or warts) can cause throat cancer from oral sex.

True		102	70%
False		7	5%
I do not know.		37	25%
		Total	146 100%

17. If someone has herpes simplex virus (herpes) on his or her mouth, during oral sex it can be passed on to the vagina or penis.

True		123	84%
False		8	5%
I do not know.		15	10%
		Total	146 100%

18. Most people with chlamydia or gonorrhea do not even know they have it. They do not feel sick.

True		116	79%
False		8	5%
I do not know.		22	15%
		Total	146 100%

19. Not having sex is the only way to make sure you do not get a sexually transmitted infection.

True		109	74%
False		22	15%
I do not know.		16	11%
		Total	147 100%

20. I prefer learning about sex education on my laptop with ear buds.

True		59	40%
False		23	15%
It does not matter to me.		67	45%
Total		149	100%

21. Sex education is a requirement by the State of MI, would you rather have sex education be taught:

Face to face (what was done in Mrs. Driscoll's class)		26	18%
Computer-based (what was done in Mrs. Hammond's or Fleisher's class)		52	35%
It does not matter to me.		70	47%
Total		148	100%

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APPENDIX C

Senior Pre-Test and Survey

Senior Sex Education Pre-survey and test
Results Overview



Date: 4/4/2012 5:48 AM PST
Responses: Completes
Filter: No filter applied

1. What grade are you in?

9th grade (freshman)		0	0%
12th grade (Senior)		118	100%
Total		118	100%

2. Are you male or female?

Female		57	48%
Male		61	52%
Total		118	100%

3. How old are you?











13 years old		0	0%
14 years old		0	0%
15 years old		0	0%
16 years old		8	7%
17 years old		87	74%
18 years old		20	17%
19 years old		2	2%
Total		117	100%

4. What is your race?








White (Caucasian)		107	91%
Black (African American)		2	2%
Asian		0	0%
Native American		1	1%
Pacific Islander		1	1%
Other		5	4%

I do not want to say		1	1%
Total		117	100%




5. How old were you when you became sexually active? (This includes oral (mouth) sex, vaginal sex, and anal (butt) sex)

I have not had oral (mouth) sex, vaginal sex, or anal (butt) sex		36	31%
10 years old		1	1%
11 years old		0	0%
12 years old		2	2%
13 years old		6	5%
14 years old		18	15%
15 years old		22	19%
16 years old		20	17%
17 years old		11	9%
18 years old		1	1%
I do not want to answer		1	1%
Total		118	100%

6. At what age did you first have sexual intercourse? (vaginal or anal sex)

I have not had sexual intercourse.		44	37%
11 years old		1	1%
12 years old		1	1%
13 years old		2	2%
14 years old		11	9%
15 years old		21	18%
16 years old		26	22%
17 years old		10	8%
18 years old		1	1%
I do not want to answer		1	1%
Total		118	100%








7. Have you been sexually active within the last three months? (This includes oral (mouth), vaginal, and anal (butt) sex.)

Yes		65	55%
No		52	44%
I do not want to answer		1	1%
Total		118	100%

8. If you answered "yes" in question 7, please check all that apply.

Oral		51	69%
Anal		6	8%
Vaginal		57	77%
I do not want to answer		11	15%

9. How many sexual partners have you had in your lifetime? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have not had any sexual partners.		36	31%
1		30	25%
2		14	12%
3		12	10%
4		10	8%
5 or more		10	8%
I do not want to answer.		6	5%
Total		118	100%

10. How many sexual partners have you had in the last three months? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have never had any form of sex.		35	30%
I have not had any form of sex in the last three months.		16	14%
1		48	41%
2		12	10%
3		4	3%
4		1	1%
5 or more.		1	1%
I do not want to answer.		1	1%

Total	118	100%
-------	-----	------

11. In the last three months, how often did you or your partner use a condom (a rubber)?

I have never had sex.		41	35%
I have not had sex in the last three months.		10	9%
Always		31	26%
Sometimes		15	13%
Never		18	15%
I do not want to answer.		2	2%
Total		117	100%

12. In the last three months, what have you used to prevent pregnancy when having sex? Please circle all that apply.

I have never had sex.		42	36%
I have not had sex in the last three months.		13	11%
Condoms		38	32%
Birth control pills		26	22%
Depo Provera Injections (shots)		17	15%
Other		8	7%
I do not want to answer.		4	3%

13. Having sex includes vaginal sex, anal (butt) sex, and oral (mouth) sex.

True		105	90%
False		9	8%
I do not know.		3	3%
Total		117	100%

14. You can get sexually transmitted infections from oral sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		91	77%
False		18	15%
		9	8%

I do not know.			
		Total	118 100%

15. You cannot get sexually transmitted infections from anal (butt) sex. (Chlamydia, Gonorrhoea, HIV, AIDS)

True		19	16%
False		89	75%
I do not know.		10	8%
		Total	118 100%

16. Human papilloma virus (HPV or warts) can cause throat cancer from oral sex.

True		60	51%
False		14	12%
I do not know.		44	37%
		Total	118 100%

17. If someone has herpes simplex virus (herpes) on his or her mouth, during oral sex it can be passed on to the vagina or penis.

True		99	85%
False		4	3%
I do not know.		13	11%
		Total	116 100%

18. Most people with chlamydia or gonorrhoea do not even know they have it. They do not feel sick.

True		86	74%
False		12	10%
I do not know.		19	16%
		Total	117 100%

19. Not having sex is the only way to make sure you do not get a sexually transmitted infection.

True		81	69%
False		30	26%
I do not know.		6	5%
		Total	117 100%

APPENDIX D

Senior Post-Test and Survey

Senior Sex Education Post-test and Survey
Results Overview



Date: 4/4/2012 5:52 AM PST
Responses: Completes
Filter: No filter applied

1. What grade are you in?

9th grade (freshman)		0	0%
12th grade (Senior)		112	100%
Total		112	100%

2. Are you male or female?

Female		56	50%
Male		56	50%
Total		112	100%

3. How old are you?










13 years old		0	0%
14 years old		0	0%
15 years old		0	0%
16 years old		2	2%
17 years old		70	62%
18 years old		38	34%
19 years old		2	2%
Total		112	100%

4. What is your race?

White (Caucasian)		96	86%
Black (African American)		3	3%
Asian		1	1%
Native American		1	1%
Pacific Islander		2	2%
Other		6	5%

I do not want to say		2	2%
Total		111	100%

5. How old were you when you became sexually active? (This includes oral (mouth) sex, vaginal sex, and anal (butt) sex)

I have not had oral (mouth) sex, vaginal sex, or anal (butt) sex		32	29%
10 years old		0	0%
11 years old		2	2%
12 years old		0	0%
13 years old		6	5%
14 years old		12	11%
15 years old		21	19%
16 years old		17	15%
17 years old		12	11%
18 years old		6	5%
I do not want to answer		3	3%
Total		111	100%

6. At what age did you first have sexual intercourse? (vaginal or anal sex)

I have not had sexual intercourse.		37	33%
11 years old		1	1%
12 years old		0	0%
13 years old		6	5%
14 years old		12	11%
15 years old		16	14%
16 years old		20	18%
17 years old		11	10%
18 years old		4	4%
I do not want to answer		4	4%
Total		111	100%

7. Have you been sexually active in October or November? (This includes oral (mouth), vaginal, and anal (butt) sex.)

Yes		58	52%
No		50	45%
I do not want to answer		3	3%
Total		111	100%

8. If you answered "yes" in question 7, please check all that apply.

Oral		41	59%
Anal		4	6%
Vaginal		47	68%
I do not want to answer		14	20%

9. How many sexual partners have you had in your lifetime? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have not had any sexual partners.		34	30%
1		24	21%
2		21	19%
3		8	7%
4		9	8%
5 or more		12	11%
I do not want to answer.		4	4%
Total		112	100%

10. How many sexual partners have you had in October or November? (This includes oral (mouth), vaginal, and anal (butt) sex.)

I have never had any form of sex.		35	31%
I have not had any form of sex in October or November.		15	13%
1		48	43%
2		4	4%
3		1	1%
4		0	0%
5 or more.		4	4%
I do not want to answer.		5	4%

Total	112	100%
-------	-----	------

11. In October or November, how often did you or your partner use a condom (a rubber)?

I have never had sex.		37	33%
I have not had sex in October or November.		16	14%
Always		26	23%
Sometimes		11	10%
Never		17	15%
I do not want to answer.		4	4%
Total		111	100%

12. In October or November, what have you used to prevent pregnancy when having sex? Please circle all that apply.

I have never had sex.		37	34%
I have not had sex in October or November.		14	13%
Condoms		32	29%
Birth control pills		24	22%
Depo Provera Injections (shots)		14	13%
Other		7	6%
I do not want to answer.		8	7%

13. Having sex includes vaginal sex, anal (butt) sex, and oral (mouth) sex.

True		91	82%
False		12	11%
I do not know.		8	7%
Total		111	100%

14. You can get sexually transmitted infections from oral sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		88	79%
False		15	13%
		9	8%

I do not know.			
		Total	112 100%

15. You cannot get sexually transmitted infections from anal (butt) sex. (Chlamydia, Gonorrhea, HIV, AIDS)

True		16	14%
False		88	79%
I do not know.		7	6%
		Total	111 100%

16. Human papilloma virus (HPV or warts) can cause throat cancer from oral sex.

True		69	62%
False		14	12%
I do not know.		29	26%
		Total	112 100%

17. If someone has herpes simplex virus (herpes) on his or her mouth, during oral sex it can be passed on to the vagina or penis.

True		92	83%
False		8	7%
I do not know.		11	10%
		Total	111 100%

18. Most people with chlamydia or gonorrhea do not even know they have it. They do not feel sick.

True		89	79%
False		11	10%
I do not know.		12	11%
		Total	112 100%

19. Not having sex is the only way to make sure you do not get a sexually transmitted infection.

True		87	78%
False		19	17%
I do not know.		6	5%
		Total	112 100%

APPENDIX E

Letter to Parents from High School

PENNFIELD SCHOOLS
8587 PENNFIELD ROAD BATTLE
CREEK, MI 49017

*Superintendent's Office
 Business Office
 Phone 961-9781,
 Fax 961-9799*

*Technology Department
 Phone 961-9750 Fax
 961-9799*

*Transportation Department
 Phone 961-9793
 Fax 961-9799*

*Athletic Department
 Phone 961-9777
 Fax 961-9748*

*Purdy Elementary
 Phone 961-9795
 Fax 961-9764*

*North Penn Elementary
 Phone 961-9797
 Fax 961-9765*

*Central Elementary
 Phone 961-9789
 Fax 961-9756*

*High School
 Phone 961-9770
 Fax 961-9799*

*Middle School
 Phone 961-9784
 Fax 441-5535*

Area Code 269

www.pennfield.k12.mi.us

Dear Parents,

In 1992, the Pennfield Board of Education adopted a K-12 Health and Reproductive Education program. An advisory committee, consisting of parents, students, teachers, clergy, health professionals and administrators recommended this program after two years of study and work. The advisory continues to meet to review and recommend new materials for adoption consideration by the Board of Education.

At the present time your child may encounter discussion, materials or assignments in any of the following courses: Social Problems, Parenthood, Individual Instruction (i.e. Learning Disabled), Family Relations, Introduction to Psychology, Health, Biology and Physical Education.

You have the right to review the materials to be used in these courses. Contact Tom Faber, Assistant High School Principal, and/or Mary Jo Andrysiak, co-chair of the Human Sexuality Advisory Committee, if you wish to preview the materials. Additionally, you will find on the district's website a link to more information regarding program guidelines, frequently asked questions, a parent resource library, meeting minutes, and committee membership. If interested, go to www.pennfield.net, click on the District tab, which will take you to the Curriculum link and the Reproductive Health program information.

As a parent you also have the right to observe reproductive health instruction in the classroom. If you wish to make arrangements for review of the materials or to observe classroom instruction, please contact Mr. Faber at 961-9770 .

Your child is eligible to participate in this instruction. By law you have the right to excuse your child from participation in the classes, which includes reproductive health and/or family planning instruction if you choose. If you wish to exercise your right to excuse your child from the specific reproductive health instruction, alternative work will be provided. If your child was excused last school year, he/she will automatically be excused this school year unless you notify the school that you wish to have your son or daughter participate in the instruction.

Please send a written request excusing your child, if you do not wish for him/her to participate in the unit in which this topic may be discussed. Please send it to Thomas Faber, High School.

Assistant Principal.

Thomas Faber, Assistant Principal
 Pennfield High School

APPENDIX F

Letter from DNP Student

August 2011

Dear Parents,

As explained in the letter sent home by the high school, sexual education is taught in the freshman Biology class as a required by the State of Michigan. Education includes sexually transmitted infections, including HIV, and AIDS. My name is Ashley Jones; I am registered nurse currently attending Valparaiso University's Doctor of Nursing Practice program. As part of this program, I am conducting a project based on research and evidence from the Center for Disease Control and Prevention (CDC) and other experts to fulfill these educational requirements from the state of Michigan.

Based on current research, computer-based education modules increase student knowledge of sexually transmitted infections, HIV, and AIDS, as well as decrease sexual activity and risky sexual behaviors. Computer-based sex education modules will be taught in the freshman biology class. Prior to the class, a survey and pretest will be given. Then two months after the class, another survey and post-test will be given to see if the modules have increased knowledge, decreased sexual activity, and decreased risky sexual behaviors. The surveys with pre/post-tests will not include students' names. There will be no way to identify students based upon the surveys and pre/post-tests. Since this project is a type of research, parental consent is required for students to take part. To review the modules that will be taught to your students and to ask questions regarding the research, two sessions will be available to meet with me **dates to be added**. Modules will also be available on the Pennfield School District website.

Senior students will not be receiving or participating in the sex education modules. However, by request of Pennfield School District's Human Sexuality Committee, seniors will be taking the survey and pretest in October as well as survey and post-test in December. Parental permission is needed for seniors to participate in the survey and pre/post-tests. If you do not want your student to take part in the survey, please return the bottom portion of the letter.

Sincerely,

Ashley Jones, RN BSN Doctoral Student
Valparaiso University

Please return the bottom portion of this form by October 1, 2011 to either the freshman biology class or Senior English class.

Student name: _____

If you wish for your student not to participate in this project please check here _____.

If you do not want your student to participate in sex education please send written request excusing your student.

Please note if you check the above, the student will still receive the sex education modules. If you check above and send written request to excuse your student, they will not participate in the surveys with pre/post-tests or sex education modules.

APPENDIX G

Outline for Sex Education Modules

- I. Overview of Sexual Health
 - A. What is sex?
 - i. Vaginal sex
 - ii. Oral sex
 - iii. Anal Sex
 - B. Effects of Sex
 - i. Emotional
 1. Short term
 2. Long term
 - ii. Physical
 1. Pregnancy
 2. Sexually transmitted infections (STI) HIV/AIDS
 - a. Short term effects
 - b. Long term effects
 - C. How do I protect myself against emotional and physical effects of sex?
 - i. Abstinence
 - ii. Condoms
 - iii. Use other forms of intimacy
 1. Hugging
 2. Kissing
 3. Hand holding
 4. Mutual masturbation
 - iv. Waiting until emotionally mature enough to cope with emotional and physical effects of sex.
- II. Bacterial STI
 - A. Chlamydia
 - i. Transmission
 - ii. Signs and symptoms of infection
 - iii. Long term effects if not treated
 - iv. Treatment
 - v. Prevention
 - B. Gonorrhea

- i. Transmission
 - ii. Signs and symptoms of infection
 - iii. Long term effects if not treated
 - iv. Treatment
 - v. Prevention
 - C. Syphilis
 - i. Transmission
 - ii. Signs and symptoms of infection
 - iii. Long term effects if not treated
 - iv. Treatment
 - v. Prevention
- III. Viral STI
 - A. HIV/AIDS
 - i. Transmission
 - ii. Signs and symptoms of infection
 - a. HIV
 - b. AIDS
 - iii. Prevention of acquiring disease
 - iv. Prevention of spreading disease once acquired
 - v. Medication treatment
 - B. Human papillomavirus (HPV)
 - i. Transmission
 - ii. Types of HPV
 - a. Cancerous
 - b. Noncancerous
 - iii. Signs and symptoms
 - iv. Treatment
 - v. Vaccination
 - vi. Prevention
 - C. Herpes simplex Virus (HSV) I and II
 - i. Transmission
 - a. HSV I
 - b. HSV II
 - ii. Signs and symptoms

- iii. Treatment
 - a. During breakout
 - b. Without breakout
 - c. During pregnancy
 - iv. Prevention
- IV. Recap of education
- A. What is sex?
 - B. How can I protect myself against STI and Pregnancy?
 - C. Bacterial STI
 - D. Viral STI
 - E. Where can I go get tested, treated, or ask questions?

