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## Oral Sex and HSV-1 Knowledge Among College Freshmen Females

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Oral Sex and HSV-1 Knowledge Among College Freshmen Females

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### Abstract

**Purpose** Herpes simplex 1 (HSV-1) disease transmission to the genitals has life long health consequences for young women. The aim of this DNP project was to assess knowledge among female college freshmen regarding HSV-1 transmission to the genitals during oral sex.

**Methods** A voluntary and anonymous online survey was e-mailed to 648 female college freshmen using their college e-mail account. **Results** A 19% ( $N=121$ ) survey response rate was achieved. Seventy-three percent of the college females reported receiving oral sex. Ninety-five percent of the college females knew the possible risk of HSV-1 transmission during oral sex. Ninety-six percent of the female students did not use a barrier device when they received oral sex. None of the females identified themselves as being at high risk for contracting HSV-1 and more than 60% were not concerned about contracting genital HSV-1. **Discussion** Survey findings were presented to college health services staff through informal discussion and a brief movie. Oral sex and HSV-1 teaching information was also provided to the staff to encourage dialogue between students and providers. Dental dam barriers were left with staff to promote safer oral sex practices among the students. **Conclusion** The results of the survey did not demonstrate a knowledge deficit of HSV-1 disease or possible HSV-1 transmission to the genitals during oral sex. However, the survey did reveal gaps in knowledge regarding the students' own susceptibility to HSV-1 through unprotected oral sex, skin-to-skin transmission risk of HSV-1, and barrier device availability for oral sex.

**Keywords:** HSV-1, oral sex, oral-genital transmission, prevention, education

### **Introduction and Background**

In previous decades, genital herpes ulcers were most commonly attributed to herpes simplex virus 2 (HSV-2) (Looker et al., 2015a). Currently, in many developed countries, herpes simplex virus type 1 (HSV-1) accounts for half of all new cases of herpes lesions in the genitals. HSV-1 has been found to be responsible for up to 85% of genital herpes in certain populations including females (Horowitz, Aierstuck, Williams & Melby, 2010), Hispanics and non-Hispanic whites, adolescents, and people between the ages of 18 and 22 (Bernstein et al., 2013; Gilbert, Levandowski & Roberts, 2010). The once called “oral” herpes, HSV-1, is now being identified as the most common cause of genital lesions among females and those being diagnosed are younger than in previous generations (Horowitz et al., 2010; Peña, Adelson, Mordechai & Blaho, 2010). HSV-1 is more likely to be spread to the female genitalia than to male genitalia (Gray, Morgan & Lindeman, 2008) during oral sex. This puts sexually active women of all ages at high-risk for HSV-1 genital infection and the need for education programs, which include HSV-1 transmission, essential prior to engaging in sexual activity.

HSV-1 genital infection transmission can occur when individuals are symptomatic as well when they are asymptomatic through viral shedding, when no lesions are present in the mouth at the time of oral sex (CDC, 2015). Roberts (2005) highlighted the lack of data collection on the incidence of HSV-1 and attributed it to state and federal infection control agencies not requiring routine HSV-1 statistics, which is still true today. These factors affect the ability to gather accurate numbers of genital HSV-1 cases. Looker et al. (2015b) performed the only known HSV-1 systematic review and estimated the global prevalence and incidence of HSV-1 among all people up to the age of 49. Worldwide, in 2012, 3,709 million people aged 0–49 years were infected with HSV-1 and 50% (140 million) of those cases were HSV-1 genital

infections among those aged 15-49 (Looker et al., 2015b). Although HSV-1 may vary in incidence and prevalence among age groups, various ethnic populations and geographic regions, it is a significant problem. HSV-1 as the primary cause of genital herpes lesions is most likely underestimated. Based on their prevalence research, Looker and colleagues (2015b) identified the America continents as having the highest prevalence of genital acquired HSV-1.

Researchers have also reported a trend of increased oral sex among adolescents and young adults from 2000-2005 (Edgardh, 2000; Halpern-Felsher, Cornell, Kropp & Tschann, 2005; Lafferty, Downey, Celum & Wald, 2000; Prinstein, Meade & Cohen, 2003). More recently Copen, Chandra and Martinez (2012) noted oral sex rates among 15-19 year olds in the United States (U.S.) between 2007-2010 were close to 50% with approximately 80% of both sexes having engaged in oral sex by age 24. Among teenagers, oral sex is still more common than vaginal sex. Chernes, Meyn and Hillier (2005) found that oral sex and vaginal intercourse were both risk factors for HSV-1 acquisition in women. For young people, acquiring a lifelong recurrent infection such as genital herpes, is not only an unfortunate surprise diagnosis, it can also invoke anxiety, guilt and social-sexual isolation (Azwa & Barton, 2009).

The United States Preventative Task Force (USPTF) recommended counseling to assist with high-risk behavior change for all sexually active adolescents and adults who are at increased risk for sexually transmitted infections (STIs) (LeFevre, 2014). O'Connor and colleagues (2014) found that high-intensity (greater than two hours of time) STI risk reduction counseling and interventions provided in clinical settings among sexually active adolescents and adults decreased STI occurrence by twofold. Eaton et al. (2012) performed a meta-analysis of 20 studies that utilized control groups and education intervention groups. They examined whether evidence-based single-session risk reduction education interventions targeting a STI would have



a positive effect on STI outcomes. The authors found those intervention groups, which received an evidence-based intervention, had on average, over a 30% less likelihood of STI infection.

Eaton and colleagues (2012) stated that a single session education encounter impacts STI transmission with minimal time and financial burden. It was expected that long-term behavior changes could be reinforced through repeated health promotion encounters with providers.

Although none of these studies focused on oral sex and HSV-1 transmission to the genitals, the potential for similar outcomes could be assumed. It is evident that there is a research gap investigating HSV-1 knowledge among young people and their need for prevention education.

### **Sexually Transmitted Infection Education**

Lazarus, Sihvonon-Riemenschneider, Laukamm-Josten, Wong and Liljestrand (2010) conducted a systematic review of STI education interventions. The review included 19 eligible studies that matched inclusion criteria for being either randomized control or intervention-only designs and examined change over time. Evidence from their review reflected the long-standing difficulty with equating increased knowledge to a change in high-risk sex behavior. The studies selected demonstrated that peer led, school-based, health provider initiated and community outreach designed education interventions were able to increase knowledge about STIs among adolescents and young adults. Out of the 19 studies, three studies showed changes in high risk-behavior sexual behavior (Lazarus et al., 2010). However, even though behaviors did not change in most of the studies they reviewed, it was found that sex education did improve health-seeking behaviors.

Lin, Whitlock, O'Connor and Bauer's (2008) systematic review did show that among adolescents and adults behavioral counseling and multiple education sessions reduced STI incidence. Oral sex education interventions targeting females may be an effective strategy to

delay first vaginal or an oral sex encounter. A randomized control study by Stephenson et al. (2004) showed the most significant behavior change occurred following a peer-led school based intervention among females. Sales, Milhausen and Diclemente (2006) conducted a review of 39 varied STI/HIV interventions that included strategies such as aiming at a specific behavior, tailoring a program to the population and layering approaches to include the individual, family, provider, community and peers. Overall, they noted that various interventions did significantly reduce high-risk sex behaviors.

### **Targeted STI Education**

Education strategies and interventions for oral sex may need to be tailored to age, gender, ethnicity, culture, religion, education level and income in order to enhance acceptability. Lazarus and colleagues (2009) found that gender, alcohol and drug use, national religion, and socioeconomic status were all variables that could be correlated with an individual's decision or ability to use a condom. The behavior change most often sought when trying to prevent STIs is condom use, but condom use does not provide 100% protection against skin-to-skin contracted STIs, such as HSV-1. Although a condom may provide some protection it is insufficient in providing protection to the entire external genital area. Schick et al. (2015) found that approximately 30% of people who reported having penile-vaginal intercourse also engaged in oral sex after intercourse and 15% acknowledged contact with the genital area at two different time points during the encounter. When there is no condom use, significant HSV-1 exposure can occur during skin-to-skin contact in these later scenarios.

Genius (2008) encouraged a more comprehensive educational approach for skin-to-skin contact diseases such as HSV-1. Educational programming should consider human developmental stages and be geared not only toward barrier use, but also emphasize the benefits

of delaying or abstaining from sexual behavior and limiting the number of lifetime partners. Social and cognitive learning theory frameworks, which incorporate role modeling, resilience building, and focus on increasing self-esteem and self-efficacy have been most successful when trying to increase safer sex behavior practices among adolescents (Sales et al., 2006).

Individuals require adequate knowledge regarding skin-to-skin and oral-genital transmission of HSV-1. Research shows there is not enough education regarding certain STIs that may not be viewed as life threatening. The perception that HSV-1 is benign is a falsehood. A need exists for a variety of educational interventions geared toward sexually active and inactive individuals. Health providers in all settings should take every opportunity to provide accurate sex education and information.

### **Problem Statement**

Young females predominately identify oral sex as having fewer diseases consequences and as being safer than vaginal intercourse. The myth that oral sex is risk-free needs to be addressed. Unnecessary pain, emotional despair, later life complications and permanent cognitive impairments in exposed newborns are all linked with HSV-1 and can be avoided. Prevention of chronic and incurable infections can also decrease susceptibility to other diseases. Healthcare providers, including college health services providers, are in key positions to educate females regarding HSV-1. Female students who have not received adequate oral sex information prior to attending college are at especially high-risk for HSV-1.

### **Review of the Literature**

In 2007 study, 98% of the individuals surveyed indicated that penile-vaginal intercourse was sex and 78% identified penile-anal intercourse as an act of sex. However, only 20% perceived oral-genital contact as being sex (Hans, Gillen & Akande, 2010). This illustrates how

many individuals do not view oral sex as a legitimate form of sex. Accompanying this belief is denial regarding the risks associated with oral sex.

Approximately 66% of females aged 15-24 reported having had vaginal and oral sex. (Copen, Chandra & Martinez, 2012). Fava and Cheng (2012) reported that adolescent and young adult females as young as 12 and as old as 21 are engaging in oral sex with the average age of initiation being age 17. Looking at the context of when oral sex occurs, Vanier and O'Sullivan's (2012) study of 431 young adults showed that the majority of oral sex encounters happened in a committed relationship and often occurred during the same timeframe right before intercourse. However, Fielder, Carey and Carey (2013) found that about 40% of occasional hook ups by females during the first year of college included oral sex compared to a modest difference of 58% engaging in oral sex with romantic partners before college.

### **Condom Use Common for Vaginal Intercourse, But Not for Oral Sex**

The American College Health Association's (ACHA) conducted a Spring 2016 Undergraduate Reference Group Executive Summary of its National College Health Assessment II (NCHA II) of 80,139 students (approximately 53,290 female) from 137 different United States' college campuses. Approximately 44% of females who answered the NCHA II survey reported they had engaged in oral sex during the last 30 days and another 24.1% of females had engaged in oral sex, but not within the past 30 days. Therefore, a total of 70% of the 53,290 college females reported engaging in oral sex. Of the, 70% of females who engaged in oral sex, only 5.2 % of them reported use of a barrier device during the act. In contrast to barrier device use during oral sex, 47.7% of females used a barrier device use during vaginal intercourse. With nearly the same numbers engaging in vaginal sex and oral sex in the past 30 days, students used condoms almost ten times more often during vaginal sex than oral sex. Barely 1% of students

reported using a female condom in contrast to the 63% reported using a male condom for vaginal intercourse. These numbers suggest that female college students do not view oral sex as “real sex”, which comes with consequences of STI exposures such as HSV-1.

### **HSV-1 is Not a Benign Virus**

Latent HSV-1 that becomes reactivated is the leading cause of ocular blindness (Khan et al., 2015) and is widely discussed. However, HSV-1’s link with cognitive impairment has received little public attention. Recent studies have linked HSV-1 with schizophrenia, characteristics of schizophrenia-like behavior, problems with working memory, verbal memory and executive functioning, and cognitive impairment among healthy individuals and patients with bipolar disorder (Fruchter et al., 2015; Prasad, Watson, Dickerson, Yolken & Nimgaonkar, 2012). Herpes simplex encephalitis caused by HSV-1, although rare, remains the most common cause of encephalitis in humans and has a high mortality rate (Kennedy & Steiner, 2013). HSV-1 has also been identified as a risk factor for the development of Alzheimer’s Disease (Itzhaki et al., 2016), but this fact is not readily shared and further research is necessary (Álvarez, Aldudo, Alonso, Santana, & Valdivieso, 2012).

### **Reproductive Health and Future Reproduction**

Very seldom are the effects HSV-1 discussed in terms of long-term reproductive health. Why this is the case, has not been identified. Perhaps the ramifications associated with HSV-1 sequelae are not as common or maybe it is not discussed in order to avoid creating fear in those millions of people infected. Whatever the reason, it is imperative that young women understand the possible long-term complications of HSV-1 on reproductive health. In a study of 135 Saudi women of reproductive age, 31.8% of them were identified as having one or two STIs and of the ones who had ectopic pregnancies 42.85% of them had one or two STIs (chlamydia 27.4%;

gonorrhea 20.2%; HSV-1 /HSV-2 21.4%) demonstrating that STIs are a significant risk factor for ectopic pregnancy (Ashshi et al., 2015). Puhakka, Sarvikivi, Lappalainen, Surcel and Saxen (2016) studied HSV-1 when acquired during pregnancy and estimated that approximately 48% of women are at risk for primary HSV-1 infection during pregnancy. Forty-one percent of babies infected with HSV-1 at birth with were at significant risk of systemic infection leading to infant death in 70-90% of those cases (Street, 2015). Females should also be aware that in order to reduce the risk of neonatal herpes; elective cesarean section is the standard of practice for all laboring patients with active lesions (Jo Groves, 2016).

### **Education Is Imperative: Knowledge is Power**

Changing behavior is a challenging task. However, the health of young female students relies on the willingness of health providers and educators to cultivate a sense of empowerment of control over their own bodies and their sexual health status by sharing accurate risk information, encouraging reduction of risk and safer sex practices. Eaton et al. (2012) showed that a single session STI behavioral intervention could reduce infection rates by 35% when compared to a control group. Communication strategies using visual messages, straightforward written brochures as well as visual aids to promote the use of condoms (Garcia-Retamero & Cokely, 2015) have been effective education strategies that have shown to change attitude and behavior thereby decreasing STI exposure. These strategies should be employed to promote dental dam use during oral sex as well.

Young people desire sexual health information to be delivered in a safe environment. With 50% of new cases of STIs occurring in individuals younger than 24 years old (Song & Halpern-Felsher, 2011), interventions provided to young people should focus not only on safer vaginal sex, STI risk reduction, increase in length of abstinence, but also include comprehensive

education and interventions for oral sex, which are often not addressed. One study showed that young adults even preferred having single sex classes taught by sexual health experts from the community and/or peer educators rather than their classroom teachers. (Pound, Langford & Campbell, 2015). Numerous education strategies have proven effective.

### **While Waiting For a Cure: Health Providers Need to Step Up**

There is no current vaccine for HSV-1 and there is no cure. Belshe et al. (2012) presented data regarding the most recent HSV-1 and HSV-2 vaccine trials in 50 clinical sites across the United States and Canada and shared that protection against infection was primarily gained for HSV-1. This is promising news for HSV-1, but until better efficacy is attained behavioral management of exposure is the only solution. Knowledge regarding transmission of HSV-1 is still critical to managing the disease while awaiting vaccine finalization and licensure.

Khurana and Bleakley (2015) emphasized the need for practitioners to ask young people about sexual encounters, including oral sex, and advised patients about the risks of various forms of sex, including oral sex. Physicians pointed to lack of time as the largest barrier to addressing preventive care (Jozkowski, Geshnizjani & Middlestadt, 2013). Narouz, Allan and Wade (2002) surveyed United Kingdom general practitioners' (GP) knowledge about HSV-1 and found that only 56% of GPs answered all questions correctly, only 47% percent were aware that HSV-1 was on the rise and only 77% were aware that the virus could be transmitted through viral shedding when patients were asymptomatic. Practitioner HSV-1 updates could also prove beneficial. University healthcare providers, including advanced practice nurses, may have more time to spend on disease prevention education. Their role may be essential in increasing female patients' involvement in preventative sexual health behaviors. The challenge lies in a lack of literature exploring university healthcare providers potential role (Jozkowski et al., 2013).

### **Theoretical Framework**

A theoretical framework such as The Health Belief Model (HBM) (Hochbaum, Rosenstock & Kegels, 1952) (see Appendix A) allows for a single narrow intervention to be taken to a broader level and also allows for a holistic approach to gathering and disseminating data. This framework was originally created to determine why people did or did not access prevention services offered by public health departments. The HBM is a model for disease prevention and early detection, but at the same time addresses lifestyle behavior change. The concepts of the HBM include: 1) a person's belief about whether or not she is at risk for a disease or health problem; 2) her perceptions of what the benefits of taking action to avoid it would be; 3) what influences or barriers exist affecting change; 4) a cue to act; and 5) the individual's level of confidence in her ability to make a change.

When using the HBM, socioeconomic status (SES), knowledge, personality, gender, ethnicity, environment, and age are considered modifying factors that influence an individual's beliefs, which then affect one's willingness to, act or not act, access or not access, and change or not change. It can take several "cues to action" or "interactions with an individual" or even attempts by the individual to learn something or to make behavior change that will last. Patience, persistence, repetition, and consistency are key components in the HBM and important during an intervention in order for a health behavior change to occur. These key components were the foundation to the overall approach of this project.

The underpinnings of the HBM include providing emotional support, encouraging self-efficacy, and addressing barriers and variables. These are things that can happen within an academic setting, a home environment, a community setting and a healthcare provider's office. Downing-Matibag and Geisinger (2009) demonstrated that the HBM can be a useful framework



for comprehending college student's sexual risk taking when their results of 71 student interviews on hooking up on campus revealed that students' perception of their own risk as well as friends' risk for sexually transmitted infections were often incorrect.

The HBM's foundation for encouraging an individual to change is to first assess one's risk. By creating an online survey about oral sex and HSV-1 this project allowed for the female college student to begin assessing her risk by reading and answering the questions related to sexual history. This process by itself invokes thought and reflection. Even though the survey did not determine one's risk for HSV-1 the female is left thinking about the connection between HSV-1 and oral sex. Her perception of her level of risk and whether or not she is personally at no, low or high risk for HSV-1 is part of the knowledge building and behavior change process. Her personal assessment of risk will determine whether changing her behavior is necessary or would be worth doing in order decrease the risk of HSV-1 transmission. The female student will have to consider what influences her to participate in or refrain from high-risk sexual activity. She will also begin to identify what barriers exist for safer decision-making and how can she make a change if she desires. The cue for the individual to act could simply be participating in the online survey, attaining new awareness, or having a conversation with a peer or a healthcare provider.

The final piece of the HBM is the individual's level of confidence: Her self-efficacy and belief that she has the ability to control her situation and her behavior in order to affect sexual behavior change and her level of risk. Knowledge and identification of the problem is the first step in decision-making. Review of literature inferred a possible knowledge gap regarding HSV-1 transmission from oral sex when a dramatic increase of HSV-1 was being found in cultures taken from lesions in female genitals (Bradley, Markowitz, Gibson & McQuillan, 2013) during

the same timeframe that research revealed a significant increase in oral sex behavior (Chandra, Copen & Mosher, 2013).

## **Project Design and Methods**

### **Design**

The DNP project was conducted using a cross-sectional descriptive design. Data was collected over a three-week period via an online self-administered, voluntary and anonymous questionnaire created on SurveyMonkey during the fall semester of 2016 (see Appendix B).

### **Setting and Population**

This project recruited a convenience sample of 648 United States freshmen female college students from a small co-ed public university in a suburb of Western Massachusetts. In the fall of 2016, the college had a total undergraduate enrollment of 5,590 and a freshman class size of approximately 1300 of which 648 were female. Female participants were recruited directly through their student e-mail accounts. Inclusion criteria were: 1) English speaking student living on campus or off campus, 2) female freshman student aged 18 years or older. Individuals who did not meet the inclusion criteria were excluded based on survey presets.

Exclusion criteria included if students could not read English independently. These females would have been unable to complete the survey independently and anonymously without an interpreter as it was written in English. Participants that did not have easy and/or private access to a computer to take the survey might also have excluded themselves. Student sensory or cognitive impairments could have interfered with student ability to take the survey as well. Therefore, these students would have been excluded from participating as well.

The sample size goal for enrollment was 100 females, based on a study performed by Montgomery, Bloch, Bhattacharya, and Montgomery (2010) where they assessed HPV and cervical cancer knowledge of 149 older women between the ages of 40-70.

### **Project Site and Stakeholders**

This DNP project was conducted in collaboration with the college's health service director and the college's information technology (IT) staff. The college health services operated with limited hours from 9 a.m. to 5 p.m. Monday through Friday. Staff of the college health services consisted of a director, who was also a registered nurse and whose role was daily facility oversight, one full-time and one part-time nurse practitioner, a patient care registered nurse and a secretary. College health services also received indirect and contracted medical consultation oversight from a local emergency department physician.

### **Facilitators, Constraints and Barriers**

Resources included the DNP candidate's time and effort devoted to project planning, creation of the online questionnaire, implementation of the survey, and evaluation of data. Collaboration with facilitators included multiple meetings and online communication with the director along with a designated IT person at the college during regular school hours. The health services director arranged for the online survey to be implemented through the college's e-mail communication system and for the IT personnel to assist the DNP candidate with the development of the survey tool. The IT personnel was essential in making the online survey accessible to the participants along with allowing for the DNP candidate to track the data real-time over the three week period. The director e-mailed the 648 students from her on campus e-mail. Other resources included the development of a brief movie presentation of the completed student survey data and results along with sample written materials and short video clips

regarding oral sex and HSV-1. Sample dental dams were left with the health services providers in order to use as teaching tools during to student health visits.

There were multiple potential barriers to this project, which included a possible lack of college student interest and participation, inability to schedule time with health services director, health services staff, and IT personnel, inability to obtain a signed stakeholder agreement and timely Institutional Review Board (IRB) approval from both the student's home institution and the project site institution.

Sappleton and Lourenço (2016) discussed the issue of low online survey response rate because individuals receive so many e-mails on a daily basis. This "e-mail overload" can cause potential participants to ignore or not read an e-mail completely. E-mail overload could cause students to open the survey and then decide not to complete it. Some students may not have had enough time to take the survey or could have been interrupted while taking the survey affecting response rate. Galesic and Bosnjak (2009) found the longer the online questionnaire the less likely the participant would complete it. Although Hamilton (2009) found college students to be more responsive to Web surveys, FluidSurveys (2017) pointed out that if a survey was about a sensitive topic that the overall response rate would likely be lower. Due to the sensitive nature of oral sex and herpes it was anticipated that the students' willingness to access the survey and complete it could be a barrier. Whether or not participants were honest with the information provided is also a consideration.

Other possible barriers included the IT personnel not dedicating time to the DNP project; the stakeholders not communicating promptly or sustaining interest in the project and potential technical issues with the SurveyMonkey website. Also, the DNP candidate did not have direct access to student e-mails. This meant that the student had to rely on the health services director

to send the survey out to the students. Site IT personnel suggested Sunday afternoon as the best day and time to send out the e-mail survey. However, this day was not used because the director did not have access to her campus e-mail list on her non-work days of Saturday or Sunday. It is possible that there would have been a higher participation rate if the survey had been sent on Sunday afternoon, as the IT personnel had suggested. There were also delays in when the survey was resent due to the director's daily schedule and her ability to send the survey out at a particular time.

In order to avert barriers, the DNP candidate communicated early in order to give stakeholders and collaborators time to process requests. The DNP candidate maintained consistent e-mail and phone communication in order to prompt director's e-mailing of the survey on each occasion and follow up with IT on data collection. The DNP candidate made multiple trips to campus to meet face-to-face with IT personnel and health services director to monitor project progress. To increase college female participation the questionnaire was kept brief with 15 questions and the format was kept simple allowing for quick answers. The consent for participation was clearly articulated in the main body of the e-mail along with a description of the survey and IRB contact names. The link to the HSV-1 survey was presented at the end of the same e-mail, which furnished the consent and the survey description and contact information of project collaborators. The e-mail was also sent on four separate occasions over a period of three weeks during the first eight weeks of the fall semester in order to increase the likelihood of student participation.

### **Goals and Outcomes**

This project was completed in order to determine if a knowledge deficit existed among college female freshmen regarding the sexually transmitted disease HSV-1 and its ability to be

transmitted from the mouth to the genitals during oral sex. General knowledge of this population was assessed, which included the percentile of English-literate college female freshmen ages eighteen and over who could correctly identify their personal level of risk, signs and symptoms, modes of HSV-1 transmission as well as what percentile knew about and used a barrier device when receiving oral sex and if a barrier was not used what were possible reasons. Knowledge about other sexually transmitted diseases that could be transmitted orally was also obtained. Another set of questions inquired about what percentile of the college females had learned about oral sex prior to coming to college and where that information was received. Finally, in order to determine the best way to provide oral sex education in the future, questions were asked of the female freshmen regarding what age they felt females should be provided oral sex education and in what manner the majority of the population would prefer to receive oral sex education.

College students who participated in a study regarding access to sexual health resources on campus, conducted by Eisenberg, Garcia, Frerich, Lechner and Lust (2012), stated that communication about available campus resources was most important to them with priorities being given to: Condom access (88.5 %), availability of on campus health services (80.8 %), nearby off-campus clinics (75.6 %), and readily available sexual health information (71.8 %).

## **Goals**

Goals specific to this capstone project included:

- Obtaining at least 100 female college freshman participants to consent to and complete the HSV-1 and oral sex SurveyMonkey.
- Gathering objective data to determine if a knowledge gap among college female freshmen regarding oral sex behavior and HSV-1 transmission to the genitals exists.
- Determining if students have conversations with healthcare providers about oral sex.

- Identifying how students want to receive sexual health information and at what age.
- Dissemination of survey data to stakeholders and health services staff.

**Outcomes:**

- Increased awareness of oral sex and oral-genital HSV-1 transmission among the college's freshmen females.
- Increased awareness among the college health services providers of the female college students' gap in knowledge regarding their susceptibility as females to STIs from oral sex and how to use a barrier to reduce their risk of HSV-1 in their genitals.
- Identified potential gaps and missed opportunities for oral sex education and intervention during college health service visits by college health services staff.
- Increased written literature provided on campus about oral sex, in particular oral sex and HSV- 1.
- Provided education about female barrier devices and recommended equal access to dental dams similar to how to male condoms are available by health services.
- Health service provision of dental dams.

**Cost-Benefit Analysis/Budget**

There was no direct cost to the site for the DNP project. The health services director and the IT personnel were salaried by the college and all project work occurred during their normally scheduled hours. Since the information gathered was utilized by health services as part of the health education for the college there was no cost to use the site. The costs of this project were nominal and included only travel, paper for printing data and dental dams for staff education.

The primary benefits of this DNP project included increased awareness by female college students about HSV-1 transmission through oral sex as well as improved access to general oral

sex health information and oral sex barrier device information as well as access from their health services providers. A secondary benefit of this project was to meet the DNP project requirement.

### **Ethics and Subjects Protection**

Due to the design of this project recruitment of human subjects from the university was necessary in order to gain necessary data to analyze. IRB approval was received from both the DNP candidate's institution and the project site. Following IRB approvals the building of the online SurveyMonkey HSV-1 survey with the university's IT department and health services director began along with obtaining e-mails of female freshmen. A cover letter (see Appendix C) was presented at the beginning of the survey and with the general e-mail sent to all female freshmen describing the purpose of the study, its voluntary and anonymous design and how data would be gathered and utilized. The survey did not ask for any identifiable information. SSL encryption was automatically done by SurveyMonkey to protect student anonymity. IRB contact information was available in the e-mail and at the end of the survey. Completion of the online SurveyMonkey on oral sex and HSV-1 was used as additional consent for the participant.

Foreseeable risks to participants could have included emotional stress due to the sensitivity of the subject matter being surveyed. However, it was made clear at the beginning of the survey that the participant was free to stop the survey at any point and there was an exit option on each question page of the survey. If a participant required assistance she was encouraged to follow up with campus health and or counseling services. Information for those resources was made available at the end of the survey.

### **Implementation Plan**

The project was conducted over a period of approximately six months. A Gantt chart was used to display particular project milestones (see Appendix D). Initiating contact with personnel



at the college site commenced in the spring of 2016. Due to summer schedules communication was done primarily through e-mails and phone conversations. IRB approvals from the DNP candidate's institution as well as the project site institution were received in August 2016. A site visit was made in early September 2016 after obtaining the signed stakeholder agreement. Collaboration with IT personnel and building of SurveyMonkey online questionnaire was completed in September 2016. In late September, the Health Services Director accessed female freshman student e-mails and created an e-mail list to include all 648 registered female college freshmen.

During the fall semester of 2016, 648 female freshmen college students were e-mailed an anonymous online survey (see Appendix B) regarding oral sex and HSV-1 four times over the course of three weeks. The goal was to have the survey open for no longer than six weeks and to capture 100 female participants. Visits to residence halls at various hours and meeting with freshman resident hall advisers could not occur per the site IRB agreement so the only way the survey was advertised was through the 648 individual e-mails.

Once data was obtained the site IT person and DNP candidate's used SurveyMonkey data analysis software and statistical analysis was completed by setting filters and comparison rules in order to obtain percentiles for each survey question. Data was tabulated and presented in bar graphs and numerical formats to be shared with stakeholders and the DNP candidate's mentors.

### **Dissemination of Information**

Project information was shared with the project site's stakeholders, health services and the academic institution of the DNP candidate. The primary audiences served were the female freshmen college students and the site's health services providers. The outcomes included increased student awareness about HSV-1 transmission and oral sex along with health service

providers' increased awareness about where student knowledge was lacking and where practice improvements could occur in order to reduce student risk of contracting HSV-1 in their genitals. The secondary audience included the college stakeholders. They were in a position to encourage safer oral sex practices by encouraging their care providers to ask about oral sex during each health service encounter. The stakeholders were also seen as instrumental in providing access to free female barrier devices as well as condoms along with accurate written information and media resources on oral sex and HSV-1 through the college health services. Further reach out to campus residence halls to share HSV-1 information was also at the will of the stakeholders. Future dissemination activities should include presentation of oral sex content to the freshman class during an orientation program at the beginning of each school year.

### **Results**

A sample of 121 female students ( $N=121$ ) aged 18 or older consented to and completed the online anonymous HSV-1 survey. Due to the sensitive content of HSV-1 and to minimize potential identifying characteristics of the participants, no demographic data was collected. Of 121 female college freshmen, 88% identified themselves as heterosexual, 3% as homosexual, and 9% selected bisexual. One hundred and twenty students out of the 121 answered the question about being recipients of oral sex. Of those 120 students, 73% of them reported that they had received oral sex.

When asked if a barrier device was used when receiving oral sex, 86 students responded to the question and 97% reported no use of a barrier device. Only 2% reported covering their genitals with a barrier device and 1% could not remember if one was used. Eighty-four female freshmen shared their reasoning for not using a barrier device during oral sex and the results were as follows: 39% said they had never heard of a barrier device for use during oral sex, 23%

didn't use a barrier because their partner had no STI symptoms, 20% didn't think to use one, 16% said it would ruin the experience and 2% reported not having one at the time. No female student selected lack of access to a barrier device from college health services or that there was no risk for STIs from unprotected oral sex as being reasons why they did not use one.

Freshmen females were also asked about their use of a drug substance when they received oral sex. Eighty-three female students responded, with 70% of those participants reporting no use of marijuana, alcohol or any other drug when they received oral sex. However, about 28% did report being under the influence of a drug and 2% could not remember.

Whether participants worried about HSV-1 infection, saw themselves at risk for HSV-1, or if they felt a sense of control over their exposure during oral sex was also asked (see Table 1).

Table 1

*Personal Risk Assessment for HSV-1 in the Genitals*

Question	Response	Yes	No	Maybe	Never thought about it	Have genital HSV-1	Never heard of HSV-1	Don't know
Do you worry about contracting HSV-1 in your genitals?	<i>n</i> =84	35%	44%		17%	0%	5%	
Do you think you are at high risk for contracting HSV-1 in your genitals?	<i>n</i> =116	0%	66%		14%			21%
Do you think you can control your exposure to HSV-1 from oral sex?	<i>n</i> =114	40%	5%	25%	30%			

Statements were used to assess the female college freshmen's general knowledge of HSV-1 along with its transmission and treatment (see Table 2).

Table 2

*General HSV-1 Knowledge (n=108)*

Statement	True	False
There is a vaccine for Herpes Simplex 1 (HSV-1)	38%	62%
HSV-1 can cause cold sores on the mouth.	97%	3%
HSV-1 can be transmitted to the genitals through oral sex.	99%	1%
HSV-1 can be transmitted by skin-to-skin contact.	46%	54%
HSV-1 can be prevented 100% by using a barrier device during oral sex.	46%	54%
HSV-1 can be cured with an antibiotic.	34%	66%
HSV-1 can be spread when the infected person has no signs or symptoms.	94%	6%
HSV-1 is be diagnosed by a doctor from taking a swab from a herpes lesion.	90%	10%
HSV-1 in the genitals can cause pain in the genital area and painful urination.	94%	6%
HSV-1 is only found among people who have had multiple sex partners.	14%	86%
HSV-1 has no cure, but symptoms can be controlled with medication	81%	19%

Participants were asked where they had obtained their sex education. One hundred and eight females responded to the survey question with 39% answering that they learned about oral sex in a health class at school, 24% never learned about oral sex while in school, 19% learned from a friend, 12% learned primarily from the Internet, 3% learned from a family member and less than 1% learned from a magazine. No student learned about oral sex from a television show.

When females were asked how they would want oral sex education provided to them during adolescence and young adulthood, ninety-nine participants shared their preferences as well as prioritized them as being a first, second or third choice (see Table 3).

Table 3

*Oral Sex Education Preference (n=99)*

Format Preference for Oral Sex Education	(n) of students who selected education option as either 1 <sup>st</sup> , 2 <sup>nd</sup> or 3 <sup>rd</sup> choice	(n) of students who selected the education option as their first choice
In a health class during middle or high school	54	25
Free website	36	12
In a visit with my healthcare provider	34	14
College course for credit	27	14
Brochure	25	7
Short internet video	22	11
Brief presentation in a campus residence hall	20	2
College orientation program before classes start	16	2
App on a phone	16	7
Fact poster	13	2
Senior year seminar the last week of high school	11	2
Powerpoint	9	0
Oral sex education should not be provided	3	0

Ninety-nine female students provided their opinion about which grades they thought students should begin to learn about oral sex with 43% choosing grades 7 or 8 followed closely by 42% selecting grades 9 or 10. Grades 5 or 6 and grades 11 or 12 each received 7% of the female responses. No college female thought sex education should wait to be taught during the freshman year of college or that sex education should not be taught in school.

Communication regarding sexual activity between female college students and their healthcare providers was also assessed. Ninety-nine students answered the question, 91% reported that their healthcare provider had asked about their sexual activity, 7% were not asked, 2% could not remember if they were asked. No student selected that they did not visit a healthcare provider regularly.

Respondents were then asked about their willingness to give their healthcare providers an accurate sexual history during a patient visit. Ninety-seven females responded to the question and 78% of those participants replied that they were honest with healthcare providers regarding their sexual health, possible exposures and relationships, 14% answered that they were embarrassed and shared only some of their information, 5% shared nothing because a parent was in the room and 3% deemed that sexual activity was not something that their healthcare provider needed to know.

Finally, knowledge of diseases capable of being transmitted during oral sex was obtained (see Table 4). A result within Table 4 of extreme relevance was that 95% percent of the 96 respondents who answered this question identified that HSV-1 could be transmitted via oral sex.

Table 4

*Disease Transmission Risk from Oral Sex (n=96)*

Diseases Transmitted Via Oral Sex	Percentage of Students Who Identified the Risk
HIV	76%
Gonorrhea	63%
Syphilis	55%
Chlamydia	62%
Herpes Simplex 1 (HSV-1)	95%
Herpes Simplex 2 (HSV-2)	74%
HPV (Human Papilloma Virus)	71%
Hepatitis B	46%
Hepatitis A	46%
Hepatitis E	34%
Hepatitis C	44%
Bowel Microorganisms (E.coli)	35%
Worms	30%
Parasites	29%

### Discussion

The majority of college freshmen females who completed the survey identified themselves as heterosexuals who had received oral sex. Ninety-five percent of respondents knew that HSV-1 could be transmitted to the genitals through oral sex and many were aware of several other diseases that can be contracted during oral sex. The students were also knowledgeable

about the signs and symptoms of HSV-1. However, even though students demonstrated an understanding of HSV-1 by 80% reporting there are medications that can help control symptoms, but there is no cure for HSV-1, only 2% used a barrier device to cover their genitals when receiving oral sex. When asked why a barrier was not used the most common most response was that they had never heard of a barrier for oral sex, followed by not choosing to use one because their partner was asymptomatic for STIs. Another 20% responded that they never thought to use one. Fifteen percent refrained from barrier use because they thought it would ruin the experience. Not one student answered a barrier was not necessary because oral sex carried little risk for STIs. Therefore, it is evident that students know barriers can be used to reduce risk of disease and that there is risk involved with oral sex.

### **Denial: The Titanium Complex**

Female freshmen appear to be in denial regarding their personal risk for HSV-1. When asked about their HSV-1 exposure worry and risk of contraction more than 60% of participants did not worry or even think about the possibility of contracting HSV-1 and over 75% selected being not being at risk. In conjunction with not seeing themselves at risk for HSV-1 only 40% saw themselves as having control over their HSV-1 exposure during oral sex. Not a single female college freshman thought she was at high risk for contracting HSV-1 in her genitals.

**“It Won’t Happen to Me”.** None of the female participants who received oral sex identified themselves as being at high risk for HSV-1 even though those same women rarely used a barrier during oral sex. It is likely that their personal risk perception of acquiring HSV-1 is built upon the belief that contracting HSV-1 is something that happens to other people and not them. These young females see themselves as invulnerable. Steinberg (2015) proposed the concept that adolescents take risks because they are adolescents and that is part of the natural



course of their development. In order to help young adults deter high-risk behavior it is suggested that public health policy change is necessary and should focus on ways to avert a situations of high-risk temptation for adolescents rather than to try to change adolescents themselves. Attention and commitment towards reducing opportunities for risky behavior would be the priority. Risk reduction of disease from oral sex among young college females would require access to dental dams where there is access to condoms. Access to barrier devices in residence halls, bathrooms, on campus stores and at the college health services is reasonable and doable.

Many behaviors such as smoking, alcohol, drug use, promiscuity, high-speed driving, not wearing a seatbelt all have negative consequences associated with them, yet people still participate in the behaviors even after education is provided and individuals are aware of the potential adverse risks. It would be presumed that knowing that one is at high risk for something detrimental would be enough for the person to cease or change her behavior. However, it appears knowledge alone is not influential enough to bring about change. Beyond having information, a cue to act for change in conjunction with, a sense self-efficacy is integral to successful negotiation by females for safer oral with partner.

### **Understanding Risk Perception**

To decrease the risk of HSV-1 transmission through oral sex knowledge is key. However, one's perceived risk is essential to applying what is known about the potential consequence of a high-risk situation. The HBM is grounded in the idea that one's perceived higher risk of a disease such as HSV-1 will lead the individual to be more inclined to take preventive health action such as using a barrier device. However, based upon the survey data, the female freshmen

did not see themselves at risk. If the female freshmen do not perceive that they are at risk, then according to the HBM, they would not see the need to change their behavior.

The findings from this project should call into question a need to rethink education and public policy efforts to promote dental dam use to reduce STI exposure, such as HSV-1 through oral sex. This survey revealed that increasing HSV-1 awareness alone is insufficient to effect preventative behavior change. There needs to be a better understanding of the actual barriers that freshmen college females encounter which deter them from engaging in safer oral sex behavior and perceiving their own personal risk. Once the barriers are identified the focus should be on alleviating those barriers.

### **Prevention Education**

**Oral Sex Education.** Early sex education regarding what diseases can be transmitted through oral sex must be provided to all females before their first sexual encounter in order to prevent HSV-1 transmission as well as all other STIs. The availability and ease of access to barrier devices for use during oral sex must also be put forth for future policy deliberation. As the survey respondents suggested, discussions about oral sex should begin during grades 7 or 8. De Rosa et al. (2010) advised that discussions about oral sex and overall sexual health issue should start before sixth grade, which would support this survey respondents' suggestion. Oral sex and disease transmission information should occur in the home, in school, and in the healthcare provider's office starting around middle school age.

Providing sensitive sex information in a public forum to young people has always been a topic of debate. Funding and health education policy varies from state to state with less funds being allocated for prevention programming. As Schalet et al. (2014) stated in their review, the United States education system primarily focuses on and funds abstinence only sex education

programming. Lerner and Hawkins (2016) suggested the need to incorporate comprehensive sex education as well. Politics and religion also play a major role in what information gets taught in schools particularly in the U.S. southern states (Canan & Jozkowski, 2016). Standardized and comprehensive sex education in schools does not exist in uniformity across the U.S.. Hall, Sales, Komro and Santelli (2016) stressed “critical gaps” in curriculum such as a lack of information on contraception and how to use barrier devices. They also pointed out that sex education, if taught, was often provided too late with students already sexually active (Hall et al., 2016).

**Comprehensive Health Education.** Bryan, Gillman and Hansen (2016) argued that comprehensive sex education is not commonplace in schools and health programming in schools has dwindled over the past decade. Without consistent delivery of sex education in the U.S. many young people who are about to engage in first intercourse at age 17 (Finer & Philbin, 2013) will do so without adequate sexual health information. Bryan et al., (2015) provided valid rationale for the need of ongoing developmentally appropriate health and sex education in school by linking it to the overall risk reduction. By teaching what safer sex means and by providing young people with tools to assist them sexual health decision-making, it is more likely they will take steps to reduce their risk. However, it is still important to recognize that simply encouraging disease reduction policies and improving sexual health knowledge does not guarantee safer sex behavior (Ellis et al., 2012).

Song and Halpern-Felsher (2011) highlighted that most health education practices and protective measures related to sexual behavior focus on vaginal sex. Clinicians and researchers typically focus on reducing sexual risk through abstinence or safer sex methods. This content concentration ignores variations in timing sequence of sex acts as well as the types of sexual behaviors, and the motivational factors that lead to the behaviors (Song & Halpern-Felsher,

2011). In the end, educational efforts typically ignore oral sex, perhaps because oral sex is associated with lower risk of STIs and no risk for pregnancy.

However, Song and Halpern-Felsher (2011) showed that 20% of students had participated in oral sex by the end of ninth grade and that oral sex appeared to be a risk factor for vaginal sex. They found a 57% likelihood that adolescents who refrained from oral sex until the end of eleventh grade would also refrain from vaginal sex. This suggests that risk-reduction interventions could likewise delay adolescent oral sex initiation. Therefore, healthcare providers being cognizant of the fact that oral sex is occurring before vaginal sex should prompt them to include discussions of oral sex along with or even before discussions of vaginal sex transpire. The results from this study reinforce the importance of oral sex when considering a comprehensive evidence-based approach to adolescent sex education and interventions.

Because research has shown that middle school students are having oral sex and sexual intercourse, preventive interventions need to begin before middle school. Interventions that address communication and relationship skills, wellness and disease information, safe and proper use of barrier should begin prior to sixth grade (De Rosa et al., 2010). Middle school interventions should address the entire range of adolescent sexual activity within a comprehensive health education curriculum

**Now's The Time to Start the Talk: Here's the How and When.** The CDC (2016) announced that the U.S. now has the highest rates of STIs ever recorded and point to budget cuts to health departments across the U.S. and closing of STI clinics as detrimental to the war on these preventable diseases. In the 2010 decade, a decrease in adolescent pregnancy was noted as well as improved rates of contraception use, yet there is an endemic of STIs (Hall et al., 2016).

When asked how and when sex education information should be provided, 55% of the female college freshmen in this project, selected they would want to learn in structured format during middle or high school. The participants' responses were split regarding exactly when oral sex education should start with 43% believing it should be done during grades 7 or 8 and another 43% in grades 9 or 10. No respondent answered that sex education should wait to be offered until college age.

Thirty six percent of the females wanted access to a free website that provided education and 36% wanting oral sex information to come from their healthcare provider. Twenty-seven percent of responders were willing to learn in a college course for credit. Only a total of three responders thought oral sex education should not be provided. A desire for sex education in school is clearly apparent.

### **Risk Reduction Considerations**

**Alcohol and Drugs: Not a Significant Factor.** Many studies have linked unsafe sex with the use of alcohol and drugs. For example, a recent study done by Moore et al. (2017) found 67% of college students who had used alcohol during their last sexual encounter also had unprotected sex. However, surprisingly 70% of students in this project reported no use of drugs or alcohol during their last oral sex encounter and still had unprotected sex. This project asserts that most students are engaging in oral sex without cognitive impairment related to a substance, which conflicts with other study findings. Further investigation regarding drug use during oral sex specifically is warranted.

**Barrier Availability and Use.** Charania et al. (2011) found that programs that distributed condoms increased the likelihood that safe sex would be practiced. If condoms are being used with a focus for STI prevention versus as a form of contraception, then increasing

dental dam availability should lead to their increased use during oral sex. However, studies have shown that even with access to dental dams women do not use them (Rowen et al, 2013).

Surveys completed by lesbian and bisexual women reported that up to 97% of those women had engaged in oral sex with only 1% reporting always using a dental dam. So although oral sex is a majority practice among women who have sex with other women it appears that dental dams are hardly ever used (Richters, Prestage, Schneider & Clayton, 2010).

**Oral Sex: It's Not a Single Event.** Research by De Rosa et al. (2010) showed that youth concurrently engage in oral sex and sexual intercourse. When considering oral sex and HSV-1 transmission to the genitals it is important to consider that oral sex often does not happen as a single sexual encounter. Oral sex is not often performed exclusively. Oral sex often occurs in combination or within a sequence of other sex acts such as vaginal, anal or other forms of skin-to-skin contact of a sexual nature. Reciprocal oral sex may also be part of a sequence of sexual acts. Therefore, talking about transmission of HSV-1 during oral sex in the context of it being a sole encounter may not be accurate.

**Oral Hygiene and Pubic Hair Grooming.** Two potential risk reduction methods when engaging in oral sex may include good oral health and delayed sexual activity after pubic grooming. Oral sex when oral lesions are present or when unhealthy periodontal disease exists can lead to increased risk for oral, respiratory and genital pathogen transmission from person to person (Saini, Saini and Sharma, 2010). Because of this they strongly recommended the use of a makeshift dental dam made from a condom or a real dental dam.

Most recent research has identified that younger individuals and females who were extreme or frequent pubic area groomers were at a 3.5 to 4-fold increased risk for skin-to-skin infections such as herpes and the human papilloma virus (Osterberg et al., 2016). Grooming

consisted of waxing and shaving most, if not all, of one's pubic hair. Those participants that groomed were also more likely to report more frequent sexual activity than those participants who reported less extreme or less frequent pubic grooming habits (Osterberg et al., 2016).

The idea of epidermal microtears and risk for infection is not new. This has been known for over forty years when the use of manual razors before surgery was found to increase the incidence of wound infection when compared to no hair removal, or if hair was clipped or removed with chemical creams. (Alfonso-Sanchez, Martinez, Martín-Moreno, González & Botía, 2017). The concept of microtears of the skin being linked with increased risk for contraction of STIs is a reasonable connection. Small openings in the skin, more frequent sex with multiple partners along with other contributing factors put these individuals who groom at higher risk.

### **Healthcare Providers**

Alexander et al.'s (2014) study confirmed that about 30% of visits between adolescents and their care providers contained no discussion about sexual health and if discussions did occur they were brief. More research is necessary to determine how to elicit these sensitive, but vital conversations with young people. If providers do not bring up the subject a missed opportunity for an intervention has most likely occurred. Barriers to open dialogue such as a parent in the room, provider bias, and embarrassment or presumptions or assumptions by either party must be brought to light. Unfortunately, increased risk taking by young people occurs during the same time they enter the developmental stages of life where personal information is shared less with their parents, guardians, and healthcare providers. Because of this time of life discordance it is vital to bring sexual health to the forefront of conversations with young people.

### **Strengths and Limitations**

In this project, using student e-mail accounts for recruitment of participants was considered a strength. It most likely increased the student participation rate. The fact that the survey was voluntary, anonymous and could be completed online increased the likelihood that the females would view and complete the survey. According to Benchmark Internet Group (2017), an “open rate” of an online survey of 15-20% is considered good and it would therefore be anticipated, that the completion rate of the survey would likely be less than 20% of those who open and view the survey, but do not complete it. There were 31 views of the survey on top of the 121 surveys that were completed. Combining the two numbers would reveal that the survey was opened 152 times, which would be 23.5% of the 648 students. What is not known is how many of the 31 views were from students who later completed survey or did not.

A response rate of 24.8% would be anticipated when surveying the general public (FluidSurveys, 2017). Although some may argue that a lower response rate means that data collected may be inaccurate or not representative of the sample, the American Association for Public Opinion Research Results (n.d.) argued that, in some cases, results from surveys with smaller completion rates showed the least bias in results. Due to the approximately 20% survey return rate with this project, which some may deem low, the findings from it are congruent to the much larger American of College Health Assessment II (ACHA) (2016) national survey of over 50,000 undergraduate college students on campuses across the United States. This is reassuring and validating. The ACHA (2016) results showed approximately 70% of the females surveyed had participated in oral sex with less than 5% using a barrier device. So although this project had a 20% return rate, it did in fact, seem to capture a representative college freshmen sample for the same query of information.



Limitations for this survey included its small sample size of homogenous heterosexual orientation, its lack of ethnic diversity, and a non-standardized survey tool. Ethnicity information was not collected during the survey, but overall the campus population was approximately 77% Caucasian. Socioeconomic status was also not part of the survey data collection. This project relied on student self-reporting with no way to verify if the information they shared was true or accurate, which was another limitation. Some students may not have wanted to provide personal information about their sexual behavior or knowledge and this could have affected the final data. The survey tool was created by the DNP candidate and was not tested for validity or reliability. Generalizing these findings to all populations would not be possible. However, it may be possible to generalize these findings to other college campuses with similar demographic configurations.

### **Future Research**

Public health departments, primary care providers, gynecologists and college campus health services have an obligation to provide young people with oral sex education and safer oral sex interventions. A comprehensive and collaborative campaign is imperative to making a change in how oral sex is viewed and discussed in order to impact this women's health issue.

This project did not investigate or address distinct actions necessary to motivate females toward safer sex behaviors. It also did not look at how to reduce risky behaviors that lead to increased STI prevalence. Insight into the sequence of how sexual events occur, such as oral sex prior to intercourse or use of a barrier at initial onset of sexual contact, may also be helpful in determining how to affect risk of STIs that are transmitted skin-to-skin (Schick et al., 2015).

The freshmen college females' lack of perceived vulnerability to STIs appears to be leading to high-risk oral sex behavior. A future survey addressing knowledge about the negative

lifelong consequences of HSV-1 may be helpful to assess if there is a gap in knowledge about HSV-1 effects on overall health and wellness and future complications related to HSV-1 acquisition.

Nurse practitioners and other healthcare providers who provide care to women with potential risks for STIs, such as HSV-1, should promote strategies to assist with the denial of risk among young college women. Education focused on HSV-1 should emphasize that all sexually active individuals are at risk of this infection through skin-to-skin contact. Barrier protection use prior to sexual skin-to-skin contact occurring would be the next best method of prevention, after abstinence from skin-to-skin contact, to decrease risk of HSV-1 transmission. An understanding by all providers of pubic grooming among younger women and its connection with increased sexual frequency and increased number of partners as a reason to inquire about sexual health and provide education should be added to the patient visit. Until future studies can prove that there is no increased risk for STIs from extreme and frequent pubic grooming, such as Osterberg et al., (2106) suggested, then abstaining from sex for a period of time until epithelial areas are healed may be beneficial.

A medical care approach that minimizes shame and potential stigma by young women who contract these infections may be advantageous to opening lines of communication. A trusting provider-patient dialogue about sexual wellness may reduce a delay in a young female seeking care. Consistent and timely verbal exchanges improve overall health care assessment, intervention and sexual health outcomes. When addressing female sexuality what may hinder a woman's ability to advocate for safer sex practice with her partner with the use of a dental dam, must be acknowledged. The current societal imbalances among the sexes should be considered when planning public health campaigns geared toward safer oral sex and women.

### **Conclusion**

This population of college women did not believe themselves to be susceptible to contracting HSV-1 in their genitals. The DNP candidate anticipated finding a knowledge deficit among college freshmen females regarding the transmission of HSV-1 to the genitals during oral sex. Instead, the findings of this project primarily showed a lack of identification of personal HSV-1 risk. Half of the female sample population was also unaware of the fact that HSV-1 was contracted through skin-to-skin contact. Finally, a significant gap existed in their knowledge about the availability and the importance of consistent barrier device use during oral sex.

Prevention and risk reduction efforts are essential in protecting the overall health of young females during their developmental stage of invincibility. HSV-1 has no cure and can have long-term health consequences. Emphasis on increasing awareness of barrier device availability and promoting barrier device use during oral sex is necessary to reduce the risk of HSV-1 transmission to the female genitals. Healthcare providers and college health services are in key positions to educate and advise young women about HSV-1 and the risks associated with unprotected oral sex.

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## Appendix A

## Health Belief Model

# Health Belief Model

Belief	Definition
Perceived susceptibility	What chance individuals believe they have of getting a specific health condition.
Perceived seriousness	How seriously individuals believe a certain condition will affect their life situation.
Perceived benefits	The benefits individuals believe there are in taking action address the health condition.
Perceived barriers	The road blocks or threats individuals anticipate in trying to address the health condition.
Cue to action	External or internal factors that stimulate individuals to act (based on their perceptions)
Self-efficacy	The level of confidence individuals have in their ability to act.

Source: Powers, M. A., Carstensen, K., Colon, K., Richeim, P. and Bergenstal, M. R. (2006). Diabetes BASICS: Education, Innovation, Revolution. *Diabetes Spectrum*. 19(2): 90-98.

## Appendix B

## Online HSV-1 Survey

**Oral Sex and Herpes Simplex 1 Virus (HSV-1)  
Knowledge Among College Freshmen Females:  
Prevention Education**

**If you can read English are age 18 or older and identify yourself as a current \_\_\_\_\_ female freshmen student, you may proceed with the survey.**

**This survey includes 15 multiple choice or true false questions. It is estimated that this survey will take 10 minutes to complete. Some of the questions are in regards to your sexual practices. These questions are personal and will be kept confidential. There is no use of names or identifying information. You are able to stop this survey at any point. At the end of this survey you can choose to submit your survey or not submit it.**

**Thank you in advance for your participation.**

1. How do you describe your sexual orientation?  
Heterosexual   homosexual   bisexual   I don't know
2. Have you received oral sex?  
Yes   No   Don't know  
*If you answered No, please skip to question #7*
3. When you received oral sex was a barrier device used to cover your genitals (dental dam, plastic wrap, cut condom)?  
Yes   No   Don't remember   I have not received oral sex  
*If you answered Yes, skip to question #6*
4. If you did not use a barrier device during oral sex why?
  - Never heard of a barrier device used for oral sex
  - Not available from health services
  - Didn't have one at the time
  - Didn't think to use one
  - Didn't use one my partner does not have STI symptoms
  - No barrier is needed, there is no risk for sexually transmitted disease from oral sex
  - It would ruin the experience
5. The last time you received oral sex had you used marijuana or alcohol?  
Yes   No   I don't remember   I have not had oral sex
6. Do you worry about contracting Herpes Simplex 1 Virus (HSV-1) in your genitals?  
Yes   No   I don't think so   I already have HSV-1 in my genitals



## Appendix B (continued)

7. Do you think you are at high risk for contracting HSV-1 in your genitals?  
 Yes    No    I don't think so    I never thought about it

8. Do you think you can control your exposure to HSV-1 from oral sex?  
 Yes    No    I don't think so    I never thought about it

9. To the best of your knowledge, answer True or False to each statement below.

There is a vaccine for herpes simplex 1 (HSV-1)	True	False
HSV-1 can cause cold sores on the mouth.	True	False
HSV-1 can be transmitted to the genitals through oral sex.	True	False
HSV-1 can be transmitted by skin-to-skin contact.	True	False
HSV-1 can be prevented 100% by using a barrier device during oral sex.	True	False
HSV-1 can be cured with an antibiotic.	True	False
HSV-1 can be spread when the infected person has no signs or symptoms.	True	False
HSV-1 is be diagnosed by a doctor from taking a swab from a herpes lesion.	True	False
HSV-1 in the genitals can cause pain in the genital area and painful urination.	True	False
HSV-1 is only found among people who have had multiple sex partners.	True	False
HSV-1 has no cure, but symptoms can be controlled with medication.	True	False

10. In high school I learned about oral sex primarily from: (only choose one)

- ☐ a family member
- ☐ a health class at school
- ☐ a friend
- ☐ the internet
- ☐ a magazine
- ☐ a t.v. show
- ☐ my doctor
- ☐ I don't know what oral sex is

11. If you were going to learn about oral sex as an adolescent or young adult how would you want the education provided? (may select up to 3 choices)

- ☐ Brochure
- ☐ Free website
- ☐ Brief presentation in a campus residence hall
- ☐ App on a phone
- ☐ College course for credit
- ☐ College orientation program before classes start
- ☐ Senior year seminar the last week of high school
- ☐ Powerpoint
- ☐ Short internet video
- ☐ Fact poster
- ☐ Visit with my doctor
- ☐ I don't think oral sex education should be provided

## Appendix B (continued)

12. What is the earliest grade you think students should be educated about oral sex?
- ☐ grade 5 or grade 6
  - ☐ grade 7 or grade 8
  - ☐ grade 9 or grade 10
  - ☐ grade 11 or grade 12
  - ☐ freshmen year in college
  - ☐ Oral sex should not be taught or discussed in school
13. The last time you visited your doctor for an annual exam:
- ☐ I was asked about my sexual activity
  - ☐ I was not asked about my sexual activity
  - ☐ I don't remember if I was asked about my sexual activity
  - ☐ I don't go to the doctor regularly
14. The last time you visited your doctor and discussed sexual activity:
- ☐ I told the truth about my sexual health, possible exposures and relationships.
  - ☐ I shared only some of my information, because I was embarrassed.
  - ☐ I shared nothing because my parent was in the room.
  - ☐ I shared nothing because it isn't something my doctor needs to know.

**Disease Transmission**

15. To the best of your knowledge, click next to each disease you think can be transmitted through oral sex.
- ☐ HIV
  - ☐ Gonorrhea
  - ☐ Syphilis
  - ☐ Chlamydia
  - ☐ Herpes Simplex 1 (HSV-1)
  - ☐ Herpes Simplex 2 (HSV-2)
  - ☐ HPV (human papilloma virus: genital warts)
  - ☐ Hepatitis B
  - ☐ Hepatitis A
  - ☐ Hepatitis E
  - ☐ Hepatitis C
  - ☐ Bowel microorganisms (such as E.coli)
  - ☐ Worms
  - ☐ Parasites

Please feel free to add comments:

**If you have concerns about your physical or mental health  
after completing this survey please contact**

## Appendix B (continued)

**Health Services located in \_\_\_\_\_ Hall back entry. Phone: \_\_\_\_\_**

Monday-Thursday 8:30AM to 5PM Fridays 10AM-5PM Closed daily from 1PM-2PM

**Counseling Center, \_\_\_\_\_**. Phone \_\_\_\_\_ Monday-Friday (9am-5pm). If you require *after hours crisis services you can contact Crisis Intervention Program, \_\_\_\_\_* or consider doing one or more of the following:

- If you are a residential student, contact your **R.A or R.D.**, who can access the on-call counselor.
- If you are on campus and need assistance, you may contact **Public Safety** who can access the on-call counselor.
- In cases of domestic violence or For more information, or to schedule an appointment, please call: \_\_\_\_\_

**Inpatient & Outpatient Psychiatric Services:** Referrals can be made easily and directly by calling the program at \_\_\_\_\_. We accept referrals from a variety of sources: crisis clinicians, private practitioners, inpatient and outpatient providers. Inquiries regarding clinical criteria, insurance preauthorization and other issues pertaining to the program may be made to any of our staff

- Sexual assault, you may speak to someone at \_\_\_\_\_ **24 hour hotline at 1-800-**

**Public Safety can be reached X or dial 911**

**This survey is being conducted for by a UMASS doctoral in nursing student. If you have any questions or concerns regarding the survey please contact**

Karen A. Hendry RN, BSN, M.Ed.  
DNP Student

\_\_\_\_\_  
Associate Professor  
Director DNP Program

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Committee, Institutional Review Board at \_\_\_\_\_

## Appendix C

## SurveyMonkey Introduction Letter

UNIVERSITY OF MASSACHUSETTS-AMHERST INFORMED CONSENT FORM FOR  
Oral Sex and HSV 1 Knowledge Among College Freshmen Females: Prevention Education

Dear Student,

I am a University of Massachusetts at Amherst Doctorate of Nursing Practice and Family Nurse Practitioner student. Every female freshman on campus has received this e-mail and survey link inviting each one to participate in an anonymous online survey on SurveyMonkey. This survey is being conducted for two purposes. First, to identify a potential knowledge gap regarding oral sex and HSV-1 transmission and provide helpful information for your campus health center to use when planning programs and when providing care and materials. Second, to allow me to gather valuable information for my doctoral capstone project at UMASS-Amherst.

The survey is brief and should only take approximately 5 to 10 minutes to complete. The survey will help answer the question of current knowledge level of female freshmen regarding oral sex health and herpes simplex 1 infection (HSV-1). It is my goal to have 100 female freshmen complete this survey whether they are sexually active or not.

All answers are confidential as far as possible under the law and anonymous: Nothing collected will be identifiable to any student who participates. SSL encryption is automatically turned on for all surveys done through SurveyMonkey. Participation is solely voluntary. There is no cost to take the survey and there is no incentive for participating other than helping the DNP student collect vital data to determine if there is a gap in knowledge and to allow your campus' health center to better serve your needs.

If you agree to participate in this survey, please click on the website link below. All answers are confidential and the information is reported strictly using numerical values. By clicking on the survey link below, you are giving your consent for participation. At the end of the survey, you will be given an option to withdraw from the survey.

Thank you in advance for your participation and if possible, please complete the entire survey.

Karen A. Hendry RN, BSN, M.Ed.  
UMASS-Amherst DNP/FNP student

Pamela Aselton, PhD, FNP-BC  
Associate Professor  
Director DNP Program  
413-545-5089  
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## Appendix D

## Project Gantt Chart

Task	August 2016	September 2016	October 2016	November- December 2016	February -March 2017	May 2017
IRB approval	X					
Recruitment of eligible participants		X				
SurveyMonkey on HSV- 1 and Oral Sex		X	X			
Analysis of data			X	X		
Survey results presented to project site supervisor				X		
Survey results and educational materials presented to providers					X	
Dissemination of results on Scholar Day						X