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Sexually Transmitted Infections and the 65 and Older Population: Knowledge and Perceived Risk

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SEXUALLY TRANSMITTED INFECTIONS AND THE 65 AND OLDER POPULATION:
KNOWLEDGE AND PERCEIVED RISK

By

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A thesis submitted in partial fulfillment
of the requirements for the

Master of Public Health

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Abstract

Sexually transmitted infections (STI) can impact all persons. Since 2000, the number of STIs has steadily increased among persons aged 50 years and older in the United States (Purpora, 2012). Persons over the age of 60 accounted for the biggest increase of in-office treatments of STIs between 2014 and 2017 (Howley, 2018). The purpose of this study was to use the Sexual Health Model to examine the relationship between various predictors and these persons' perceived risk of STIs, their STI knowledge, and other barriers that impact the sexual health of persons 65 years of age and older. This study used a 30-item survey to assess these predictors. The data collected was analyzed via IBM SPSS version 25 using descriptive statistics, chi-square/correlation, and multiple linear regression. The findings of this study indicated a few predictors that impact sexual health of those 65 years of age and older, including gender, Medicare enrollment, and STI knowledge. Although this study had its limitations, it is one of the few examining sexual health within the 65 and older population. Even though some predictors were identified, this study highlights the need for sexual health education within the 65 and older population, especially between health care providers and patients of this age group.

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Chapter 1: Introduction

Sexually transmitted diseases (STDs), sometimes called sexually transmitted infections (STIs), are very common and can be passed from one person to another via vaginal, oral, or anal sex (CDC, 2018b). Diseases that are spread through sexual contact are usually referred to as STDs; however, a new term is emerging, STI (ASHA, n.d.). The change from “disease” to “infection,” is because disease suggests a clear medical problem with obvious signs and/or symptoms and most STDs do not have any signs and/or symptoms (ASHA, n.d.). If signs and/or symptoms are present, they are most often mild and then can be referred to as an infection, which may or may not lead to a disease (ASHA, n.d.). This term has not been accepted by everyone in the medical and public health fields (ASHA, n.d.), but for the purpose of this paper, STI will be used.

People aged 65 and older are not the first group that comes to mind when discussing STIs. The assumption is that persons 65 and older are less sexually active than their younger counterparts, which is not always the case (Purpora, 2012). STDs/STIs do not discriminate against age, gender, or sexualities; they affect persons from all types of backgrounds (ASHA, n.d.). Due to medical advancements, including medications, people are able to live longer, despite health issues, including sexual health issues (Howley, 2018). Since 2000, the number of STIs has steadily increased among persons aged 50 years and older in the United States (Purpora, 2012). Persons over the age of 60 accounted for the biggest increase of in-office treatments for gonorrhea, syphilis, chlamydia, herpes simplex, hepatitis B, and other STIs between 2014 and 2017, which was a 23% increase compared to previous years (Howley, 2018; Cohen, 2018). The rates of STIs increased by about 20% among Americans 45 years or older between 2015 and 2016; however, an increasing year-over-year trend has been observed since 2012 (Lilleston,

2018). Several factors can account for the increase of STIs within the 65 years of age and older population: the ability to maintain sexual function longer with pharmaceutical assistance, changes in immunity and weakening mucosal tissue, and accessibility in community living (Crawford, 2017).

As of July 2018, Clark County has a population of 2,231,647 persons, with 14.7% of that population being persons 65 years or older (U.S. Census Bureau QuickFacts: Clark County, Nevada, n.d.). In 2016, Nevada was ranked 20th out of all states with the largest rates of STIs (Bekker, 2017). This trend was seen in Clark County, as well, with a ranking of 20 out of 70 nationally ranked counties and independent cities for chlamydia, gonorrhea, primary and secondary syphilis (Bekker, 2017). Based upon the 2016 STD Fast Facts produced by the Office of Public Health Informatics and Epidemiology, persons 65 and older contribute to the STI rates within Nevada; although, their STI rates are lower than other age groups (Office of Public Health Informatics and Epidemiology, 2017.)

To date, little research and educational programs target STI prevention in the 65 and older population (Cohen, 2018). The lack of educational programs is not this population's fault, as persons 65 and older are not associated with sexual activities (Imparato and Sanders, 2012; Letvak and Schoder, 1996). This lack of association between persons 65 and older and sexual activities enables increased levels of STIs to appear without any notice (Minichiello, Rahman, Hawkes, & Pitts 2012). The purpose of this study is to gain a better understanding of persons 65 and older perceived risk and knowledge of STIs. The results of this study could aid in the development of behavioral prevention intervention(s) to help promote sexual health, safer sex, and the prevention of STIs within the 65 and older population and increase awareness of this problem within the Las Vegas community.

Chapter 2: Literature Review

The improved quality of life, medical advancements, better nutrition, and general wellbeing have all contributed to the extension of an active sex life in persons 65 years of age and older (Okuno, Fram, Batista, Barbosa, & Belasco, 2012). In 2010, the U.S. Census Bureau estimated that Americans aged 50 or older comprised approximately 30% of the population (US Census Bureau, 2018). By 2030, persons born in 1954, will be older than the age of 65, meaning that 1 in every 5 persons in the U.S. will be of retirement age (US Census Bureau, 2018). With that being said, the target population of this study is those aged 65 and older. Additionally, by 2035, 78 million people 65 years or older will live in the U.S. compared to the 76.7 million under the age of 18, a first in U.S. history (US Census Bureau, 2018). With this population surpassing the younger population, the healthcare system will face new challenges in regards to the health of persons 65 years of age and older. Although the population is living longer, they are not immune to various diseases or infections, including those that are sexually transmitted (Mather, 2016). For example, baby boomers are five times more likely to have Hepatitis C than any other generation, as well as, and 6% of Americans living with HIV are 65 and older (“Statistics,” n.d.).

Surveillance data show higher rates of STIs in some racial or ethnic minority groups when compared with whites (“STDs in racial and ethnic minorities”, 2017). In 2017, African American/Black males aged 65 years and older had the largest rate of chlamydia within the United States (Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 2018a). The same trend was observed in Clark County in 2017 (Office of Public Health Informatics and Epidemiology, 2018), using CDC WONDER. CDC WONDER is an online database, to analyze the STI rates within different racial groups in Nevada, who are 40 years of age and older. The age limit of

CDC WONDER is 40 years and older; therefore, we are unable to query rates of those explicitly 65 and older. Based upon the CDC WONDER, African American/Black males, who are 40 years of age and older living in Nevada, had the highest rates of chlamydia with 172.62 cases per 100,000 population (US Department of Health and Human Services, 2014). African American/Black women aged 65 years of age and older also had the largest rate of chlamydia in the United States in 2017 (Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 2018a). However, American Indian/Alaska Native women, who are 40 years of age and older living in Nevada, had the greatest rate of chlamydia at 46.00 cases per 100,000 population, based upon CDC WONDER (US Department of Health and Human Services, 2014).

As for Gonorrhea, White persons 65 years of age and older had the largest rate throughout the United States in 2017 (Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 2018b). However, Clark County showed similar trends as chlamydia with African American/Black men and American Indian/Alaska Native women 40 years of age and older living in Nevada, had the highest rates of Gonorrhea with 214.73 cases and 15.33 per 100,000 population, respectively (US Department of Health and Human Services, 2014). In 2016, the overall rate of gonorrhea for Clark County was 129.1 cases per 100,000 populations (Healthy Southern Nevada, 2016.). Approximately 20.9% of those cases were from those 65 years of age or older (Healthy Southern Nevada, 2016).

White persons 65 years of age and older had the largest rate of syphilis throughout the United States in 2017 (Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 2018c). In the

year 2016, there were 11.8 cases per 100,000 population of syphilis in Clark County (Healthy Southern Nevada, 2016). Approximately 17.7% of these cases were from those 65 years of age or older (Healthy Southern Nevada, 2016), with men having more reported cases than women (Office of Public Health Informatics and Epidemiology, 2018). According to CDC WONDER, only male data was observed, with African American/Black males with the highest rate of primary and secondary syphilis of 21.05 cases per 100,000 population (US Department of Health and Human Services, 2014).

The observed trends show that STIs impact persons of all ages including those 65 years of age and older throughout the United States and in Clark County. Since STI rates are increasing in those 65 years of age and older, it is important to review the population's behaviors and knowledge to determine how they contribute to these rates. Some sexual behaviors within the target population will be discussed, as well as, other factors that may contribute to the increasing rates of STIs. Some of these factors include lack of condom usage, physiological factors that contribute to sexual health, the population's sexual health knowledge, and the social norms they grew up with.

Lack of Condom Usage

One of the biggest contributors to increased STI rates within the 65 and older population is lack of condom usage (Schwartz, 2010). Numerous studies have demonstrated how consistent and correct usage of latex male condoms reduces the overall risk of many STIs, including chlamydia, gonorrhea, and syphilis (CDC, 2013). Inconsistent usage or improper usage can lead to the transmission of an STI since transmission can occur with a single-sex act with an infected person (CDC, 2013). Therefore, the importance of proper and consistent latex male condom

usage is extremely important to all age groups for the prevention of all STIs, including the 65 and older population.

Many reasons exist as to why persons 65 and older do not use condoms. One reason is lack of knowledge regarding safe sex measures, such as condoms for men and women (Boskey, 2019). Most people are familiar with common STIs, such as herpes, chlamydia, and gonorrhea; however, more than 30 agents that lead to STIs may be transmitted via sexual and nonsexual means (Letvak and Schoder, 1996). It is possible that persons 65 years of age and older have ignored the public health messages relating to their sex-lives because they have been in long-term relationships until now (Haupt, 2010).

Another reason for lack of condom use is that persons 65 years of age and older tend to associate condoms with the prevention of pregnancy and not the prevention of the disease (Schwartz, 2010). In turn, the 65 and older population relied on other contraceptives, such as oral birth control, because they were more concerned with becoming pregnant than STIs (Haupt, 2010). Women, who are 65 years and older, are post-menopausal thinking pregnancy is no longer an issue; therefore, they perceive that a condom is not needed, but they do not think about or perceive themselves at risk for an STIs (Boyles, 2012; Bodley-Tickell et al, 2008). Additionally, an AARP study reported that men over the age of 50 claimed they do not use condoms since condoms reduce skin-to-skin contact or a condom will cause them to lose an erection (Schwartz, 2010). Whatever the reasoning, the literature shows the lack of condom usage among this population is a contributing factor to the increased rates of STIs (Schwartz, 2010).

An AARP study examined condom usage in heterosexual and homosexual Americans aged 50 and older. Their results indicated that overall one out of five individuals used a condom

regularly, whereas only 12% of men and 32% of women used condoms regularly (Schwartz, 2010; Boyle, 2012). A study conducted at Indiana University found men and women over the age of 60 had the lowest condom usage of any population (Pereto, 2018; Cohen, 2018). The National Survey of Family Growth indicated that approximately 36% of women and 53% of men aged 15-19 indicated consistent condom use, compared to, only 11% of men and 9% of women aged 60 and older ("Survey Shows Condom Use Higher among Young People", 2017). A study conducted at the University of Chicago found that 60% of women aged 58-90 did not use a condom the last time they engaged in sexual intercourse (Purpora, 2012). A qualitative study found similar results in which participants with gonorrhea were interviewed and indicated their inconsistent or lack of condom use (Purpora, 2012).

Furthermore, race can be considered a factor of consistent condom-usage. A study conducted at Florida State University examined condom-usage among low-income women. Their results indicated Black and Hispanic women reported more consistent condom usage than White women (Soler, Quadagno, Sly, Riehman, Eberstein, & Harrison, D.F., 2000). Additionally, 90-95% of White and Black women felt comfortable talking about condom usage with their partner, whereas only 75% of Hispanic women felt comfortable talking condom usage with their partner (Soler, Quadagno, Sly, Riehman, Eberstein, & Harrison, D.F., 2000). On the other hand, another study analyzed condom-usage in men, and their results indicated that Black and Hispanic men reported the lowest consistent condom usage rate (Essien, Ross, Fernandez-Esquer, & Williams, 2006). Based on these two studies, race seems to be a factor in condom usage. However, neither study involved persons 65 years or older, but similar trends can be assumed since epidemiological shows similar trends in STI rates.

Knowledge

There is very little information on the knowledge of STIs within the 65 year of age and older population. No information was found on men's knowledge in terms of sexuality. The following study only focuses on women and their knowledge of sexuality. The Okuno, Fram, Batista, Barbosa, & Belasco study (2012), found a relationship between gender and sexuality knowledge. Women, aged 50 and older, were found to be more knowledgeable in terms of sexuality, especially the transmission of STIs and AIDS (Okuno, Fram, Batista, Barbosa, & Belasco, 2012). Women may be more knowledgeable in terms of sexual health since women often live longer than men, but often have more illnesses than men (Ginter and Simko, 2013).

Due to their longer lifespan, women often seek comfort or companionship after the death of their spouse/significant other (Imparato and Sanders, 2012). Due to the desire for companionship and the lack of condom usage, as mentioned before, they often put themselves at a higher risk of contracting an STI (Imparato and Sanders, 2012).

Physiological Factors

As men and women age, their immune system changes, which increases the risk of contracting an STI compared to their younger counterparts (Boskey, 2019). Additionally, their immune systems have a weaker response to various STI treatments (Imparato and Sanders, 2012; Jennings, 2015). For example, post-menopausal women have an increased risk of contracting an STI. As women age, estrogen levels decrease causing vaginal wall thinness and vaginal dryness (Howley, 2018). During intercourse, a thin vaginal wall is more likely to tear, allowing for the transmission of foreign agents to enter the body more easily (Letvak and Schoder, 1996; Howley, 2018). Furthermore, women who take estrogen inhibitor medications to treat breast cancer can also have further thinness of the tissue. Due to further thinning of the tissues, these women are at

a greater risk of more abrasions and disease susceptibility (Howley, 2018). Therefore, due to the vaginal tissue thinning, women are at an increased risk of contracting an STI due to tears within the vaginal wall.

Men also have physiological factors that can result in an increased risk of STIs. The increased use of erectile dysfunction medications has coincided with the increased rates of STIs within the elder population (Boyles, 2012). Men often encounter erectile dysfunction as a result of aging or as the result of other medications being taken for a chronic illness (Purposa, 2012). Erectile dysfunction is the inability to sustain an erection for intercourse (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). The inability to maintain an erection in men has resulted in erectile dysfunction medications.

It is also possible that these medications have increased the number of sexually active men aged 65 and older, increasing the number of persons at risk for contracting an STI (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). A positive note is the use of these medications has allowed men to talk with their physician about their sexual health, including STIs, which may help to bring awareness to this issue (Purposa, 2012). By becoming more aware of STIs and their potential effects, a drop in STI rates may be observed in the future.

Baby Boomer Generation

Baby Boomers are defined as persons born between 1946 and 1964. The target population of this study is persons born in 1954 or earlier; therefore, a portion of the target population consists of the Baby Boomer generation. The Baby Boomer generation was growing up in the 1960s, during a time of sexual revolution and many healthcare discoveries (Cohen, 2018). The birth control pill, or better known as “the pill,” was the most common means of contraceptive (Cohen, 2018). Penicillin was able to treat anything (Howley, 2018). With these

notions in mind, Baby Boomers had a new sense of freedom that no other generation has had (Pereto, 2018). They were able to have multiple partners and engage in sexual intercourse with fewer consequences than any prior generation (Pereto, 2018).

This population grew up in a time when experimenting with various sexual activities was encouraged. Now, that these individuals are older, they are engaging in the same behaviors as they did when they were in their 20s (Pereto, 2018). Some of these behaviors include extramarital affairs. Persons born around 1954 or before have the highest rates of extramarital status (Wolfinger, 2017). A study published in 2017 indicated 20% of Americans over the age of 55 have engaged in extramarital affairs, whereas only 14% of Americans under the age of 55 have engaged in extramarital affairs (Bort, 2017). The reasoning behind these affairs is the era in which this population became of age (Bort, 2017). Because of their sexual revolution tendencies, they are more likely to engage in sex with someone other than their spouse (Wolfinger, 2017).

Due to their social norms of multiple sex partners and/or extramarital affairs, Baby Boomers are putting themselves at a greater risk of contracting an STI (Nagourney, 2013). STIs were not viewed as a life-or-death matter to Baby Boomers during their sexual revolution (Howley, 2018). However, having multiple sex partners is believed to increase the risk of STIs (Joffe et al., 1992). Therefore, if persons 65 years of age and older carry over their sexual revolution tendencies into their present-day lives, they are often putting themselves at risk for an STI.

Ageist Attitudes

Persons 65 years or older are often overlooked in terms of sexual health. Ageist attitudes, a discrimination based on someone's age, cause many people to assume that persons 65 and older do not engage in sexual activities (Letvak & Schoder, 1996). According to an AARP

survey completed by middle-aged and older men and women across the nation, about 3 out of 10 individuals, aged 45 and older, engaged in intercourse at least once a week (Boyles, 2012).

Another study indicated that sexual activity in persons 65 years of age and older occurs two to four times per month (Letvak and Schoder, 1996). Relatedly, 85% of men and 61% of women who completed the AARP survey indicated sex was an important quality of life (Boyle, 2012).

The CDC recommends screening for STIs in patients between the ages of 13 and 64 (Purposa, 2012). Medicare does not require physicians to ask about a patient's sex life during a patient's annual exam (Howley, 2018). With the CDC's recommendation and assumption of lack of sexual activity, a large portion of healthcare professionals do not talk with their elder patients about their sex lives or screen them for STIs (Howley, 2018; Crawford, 2017). Furthermore, physicians should be completing the Comprehensive Geriatric Survey, annually, for their 65 and older patients (Ward and Reuben, 2020). The Comprehensive Geriatric Survey is a multidisciplinary diagnostic and treatment process that helps to maximize overall health with aging (Ward and Reuben, 2020). This assessment contains various categories, including sexual function, that are not always included in the evaluation (Ward and Reuben, 2020).

Since persons aged 65 and older are often not screened for STIs, they may be misdiagnosed with another disease/infection instead of an STI, because their provider assumes that they are not sexually active (Imparato and Sanders, 2012). Through misdiagnosis, many STI rates within the elder population are underestimated (Imparato and Sanders, 2012) and not discussed.

Talking with Physicians

Many people over the age of 65 often do not feel comfortable talking about sex with their physician (Morton, Kim, & Treise, 2011). Many women said their comfort level talking to their physician was very low; therefore, they did not bring up any sexual health issues (Morton, Kim,

& Treise, 2011). To make the conversation more difficult, the communication skills necessary to understand safe sex practices are less developed in persons 65 years of age and older compared to their young counterparts (Letvak and Schoder, 1996). Many adolescents complete a sex education course as part of their school's curriculum; however, elder adults do not have this option (Purposa, 2012; Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). If persons 65 years of age and older participated in a sex education class, it was over 30 years ago.

Additionally, a lot of the information presented in sexual education courses has changed since this target population has taken the course (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). Therefore, older adults, in particular, those 65 years of age and older, maybe lacking the knowledge and skills associated with talking about sex (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). Younger adults are often bombarded with numerous advertisements on the importance of safe sex, whereas older adults are often overlooked. However, patients are not entirely to blame. Physicians do not open up the dialogue with their elder patients either (Howley, 2018).

Many research studies indicate an inverse relationship between the discussion of a patient's sexual history and age (Ports, Barnack-Tavlaris, Syme, Perera, & Lafata 2014). Surveys have shown that physicians rarely, if ever, discuss a person's sexual history, such as history of STIs, knowledge of safe sex, and condom usage, with patients over the age of 50 (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). Overall, the conversation about sexual health needs to become more common between physicians and their elderly patients (Jennings, 2015). A lack of conversation can be detrimental to a person's health, especially those who are 65 years of age and older. A conversation about STIs, how to prevent them, and other safe sex measures

can ultimately decrease STI rates (Jennings, 2015; Ports, Barnack-Tavlaris, Syme, Perera, & Lafata 2014; Crawford, 2017).

Medicare

Medicare is a federal health insurance policy that covers those that are 65 years of age or older (“What's Medicare?”, n.d.). Medicare covers other persons with certain disabilities as well. There are three parts of Medicare: Medicare A, Medicare B, and Medicare D (“What's Medicare?”, n.d.). Medicare A is known as hospital insurance, whereas Medicare B is medical insurance, and Medicare D is prescription drug coverage (“What's Medicare?”, n.d.). Medicare B covers certain physician services and preventative screening, including STI screening (Medicare Rights Center, n.d.). Additionally, STI screenings are covered annually through Medicare’s yearly “Wellness” visits (U.S. Centers for Medicare & Medicaid Services., n.d.). These yearly “Wellness” visits are to help individuals develop a personalized prevention plan to help prevent disease and disability based on the patient’s health status (U.S. Centers for Medicare & Medicaid Services., n.d.). As previously mentioned, physicians are not required to ask about a patient’s sex life (Howley, 2018). However, if the patient completes the “Health Risk Assessment” indicating potential risk factors of contracting an STI, physicians may then recommend an STI screening (U.S. Centers for Medicare & Medicaid Services., n.d.).

On the other hand, many individuals with Medicare do not know that STI screening is covered (“What's Medicare?”, n.d.). This may be due to lack of communication, or lack of STI screening recommendations from their healthcare providers. As mentioned before, the CDC recommends screening for STIs in patients between the ages of 13 and 64 (Purposa, 2012). In other words, those who qualify for Medicare are not recommended for STI screening. Therefore,

it is important for physicians to inform their patients of annual STI screenings, as well as for the patient to understand that Medicare will cover such charges.

Theory - Sexual Health Model

As demonstrated in the literature review, multiple factors contribute to increasing STI rates in the 65 and older population. These same factors can be found in the sexual health model. The sexual health model was derived from three main concepts: preexisting characteristics from a sexological approach to comprehensive sexuality education, cultural specific and normative models from literature, and previous research on sex attitudes, practices, risk factors of various populations, and safe sex decision making (Robinson et al., 2002). The initial assessment of the Sexual Health Model developed from Sexual Attitude Reassessment (SAR) seminars. These seminars are structured group experiences, that allow individuals to express their values and beliefs surrounding sexuality (Sexual Health Alliance, n.d.). From the evaluation and designs of SAR seminars and other research studies, the Sexual Health Model was developed. The Sexual Health Model contains ten constructs that are believed to be essential aspects of healthy human sexuality (Robinson et al., 2002). These ten constructs are: talking about sex, cultural and sexual identity, sexual anatomy functioning, sexual health care/safe sex, challenges associated with sex, masturbation and fantasy, body image, positive sexuality, intimacy/relationships, and spirituality (Robinson et al., 2002). Each of these constructs mentioned plays a role in how the 65 and older population views their sexual health.

For the purposes of this study, we will focus on four constructs: talking about sex, intimacy and relationships, challenges, sexual healthcare/safer sex. These four constructs were chosen since they are the most represented in the published literature. Many studies indicate the lack of communication between healthcare providers and patients that are 65 years of age and

older. Additionally, intimacy and relationships are a focus of this study due to Baby Boomer's sexual revolution tendencies, such as multiple sex partners and extramarital affairs, that they've carried over to their present-day lives. Some challenges persons 65 years of age and older face in terms of sexual behaviors are ageist attitudes presented by the general public and healthcare professionals, physiological factors that increase their chances of contracting an STI, and their lack of knowledge surrounding STIs and safe sex practices. Finally, sexual healthcare and safer sex will be analyzed since many studies indicate that condom use decreases as age increases (Haupt, 2010). Overall, the sexual health model will be used to evaluate and address perceptions and knowledge of STIs within the 65 years of age and older population.

The general conclusion to be drawn from the literature review is that persons 65 years of age and older do not know about and do not think they are at risk of contracting sexually transmitted infections (STIs). Growing up in the 1960s, persons 65 years of age and older did not face the consequences associated with multiple sex partners or unprotected sex that exist today. They believed that penicillin and "the pill" would be a cure-all. Since this is most likely the only sex knowledge persons 65 years of age and older have, they are likely to believe they can continue or resume these behaviors without any consequences. Therefore, this lack of awareness and perceived vulnerability to STIs leads to the fact that more prevention and educational measures are needed to help combat the increasing rates of STIs within the 65 and older community.

Chapter 3: Methods

Based upon the literature review and the constructs within the sexual health model, the purpose of this study was to assess the 65 and older population’s knowledge of sexual health and perceived risk of contracting STIs. STI rates are continuing to rise and few studies or educational programs have targeted persons 65 years of age or older. Therefore, this study aimed to answer the following questions:

- What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
- What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?
- What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?

Table 1 defined the independent and dependent variables for each research question presented in this study.

Table 1: Independent and Dependent Variables and Relation to their Research Question

Research Question	Independent Variable(s)	Dependent Variable(s)
What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?	Sexual Activity Risk Behaviors Demographics	STI Knowledge
What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?	STI Knowledge Risk Behaviors Sexual Activity Demographics	Perceived Risk
What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?	STI Knowledge Sexual Activity Demographics	Risk Behaviors

Study Design

This study was exploratory in nature. A cross-sectional design and convenience sampling were used. Participants were asked to complete a 30-item survey focused on STI knowledge, perceived risk of contracting an STI, safe sex practices, and discussion of STIs with health care professionals. The survey was available in pencil and paper format and online. Due to the COVID-19 pandemic, recruiting participants in person was difficult, especially because the target population of this study was at a higher-risk for COVID-19. Therefore, completing the online survey instead of in-person became an option for participants.

Study Population

Based upon a sample size estimator for a 95% confidence interval and 10% margin of error, only a total of 87 surveys needed to be completed. The sample size estimator was calculated via a sample size calculator (<https://select-statistics.co.uk/calculators/sample-size-calculator-population-proportion/>). Due to the likelihood of incomplete surveys, at least 150 persons were surveyed in order to increase the likelihood of obtaining 87 completed surveys.

The inclusion criteria for an individual to participate in the study were:

- Must be 65 years or older
- Must reside in Clark County

Persons excluded from this study included those under the age of 65, those residing outside of Clark County, those unable to give consent, or those unable to answer survey questions. Individuals who were not their power of attorney were not able to participate due to legal reasons.

This study focused on individuals 65 years or older. These individuals have access to Medicare. With Medicare, these individuals also have access to STI screening and tests

(Medicare Rights Center, n.d.). If the study had included those under the age of 65, healthcare insurance status could have been a confounding factor.

Methods of Recruitment and Informed Consent

After IRB approval (protocol number: 1459545-3) was achieved, data collection began. Data collection occurred in a physician's office located in Las Vegas, Nevada. Participants were asked to complete the 30-item survey in pencil and paper format by the researcher during the triaging process since the survey does contain some personal information. Participants were given a verbal, general description of the purpose and nature of the study and survey. If the participants chose to participate, the consent form was incorporated into the survey. By completing the consent form, participants agreed to participate in the study. Participants were given a manila folder with the survey, incorporated consent form, clipboard, and pencil to complete the survey. The survey took participants approximately 15 to 20 minutes to complete. Some participants required more time and were asked to complete the remainder of the survey in the check-out area of the office. By having participants complete the remainder of the survey in the check-out area, this ensured that the residing physician would stay on schedule with his patients. Participants were asked to put the survey back into the manila folder once done to ensure privacy and confidentiality. After the participant completed the survey, their participation in the study ended.

Completed surveys were collected either by the researcher or medical assistants, who left the completed surveys in a locked drop-box at the end of each day. The researcher collected the paper surveys every three days. Signed consent forms were separated from completed surveys. Signed informed consent forms and completed surveys were kept in a secure location within the principal investigator's office. No one besides the researchers had access to the data. Once the

desired number of surveys were completed, the data was entered into SPSS for further analysis. Additionally, electronic data was password-protected to protect the privacy of participants.

If participants had any questions during the procedure, they asked the researcher. Both the principal investigator and researcher were listed at the end of the consent form and survey, in case of questions.

Data collection was done during the COVID-19 outbreak; therefore, data collection was more difficult to obtain since the target population of this study is the higher-risk population of COVID-19. To help with data collection, recruitment of participants was also done online via social media (Facebook, NextDoorApp, etc.) with the approval of IRB. Potential participants were contacted via social media and asked if they would be willing to complete the survey online via Qualtrics. Those that were contacted were targeted specifically because their age was known to be 65 or older. The online survey was in the same format as the paper survey, except the removal of one question. Since online participants were not completing the survey in the physician's office, this question was removed. Everything else, including the incorporated consent form, was the same as the surveys completed in the physician's office.

Study Instruments

Data was collected for this survey using a self-administered general STI-knowledge and perceived risk survey developed by the researcher consisting of 30-items. Majority of survey questions were adapted from other surveys; however, some questions were designed by the researcher. The questions from this survey were based on questions from other surveys including the General Social Survey (GSS) and the Behavioral Risk Factor Surveillance Survey (BRFSS). For example, the perceived risk and STI knowledge were adapted from a previous study completed by Denise Pichon at the University of California, Long Beach (Pichon, 2000). Some

of the other STI knowledge and sexual activity questions were based on questions from VOICE/VOCES Pretest (CDC and Macro International Inc., 2008). Demographic, risk behavior, and STI knowledge questions were adapted from the BRFSS (CDC, 2018a). Other risk behavior questions were adapted from GSS (Smith et al., 2018). The remaining questions were from the researcher, based on the literature review.

These questions were selected to examine constructs from the Sexual Health Model, in particular those relating to talking about sex, intimacy and relationships, challenges, sexual healthcare, and safer sex. Table 2 illustrates each survey question, the affiliated construct, and the relationship to each research question. No identifying information will be collected as part of the survey, to protect participants' confidentiality and anonymity.

Table 2: Survey Questions, their Constructs, and Relation to the Research Question

Survey Question	Construct	Research Question
Are you currently sexually active? Sexually active includes engaging in sexual relations, such as oral, anal, or penetrative sex.	Intimacy and Relationships	<p>What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?</p> <p>What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?</p> <p>What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?</p>
Have you ever been screened for an STI?	Sexual Healthcare and Safer Sex	<p>What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?</p> <p>What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?</p>
Since turning 65, how often do you think about your chances of getting or having an STI?	Challenges	What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?
What do you believe are the chances of someone your age getting a STI if they engage in oral sex?	Challenges Sexual Healthcare and Safer Sex	What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?
How likely do you think that someone your age gets a STI if they engage in unprotected sex?	Challenges Sexual Healthcare and Safer Sex	What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?
How likely do you think that someone your age gets an STI if they engage in sexual activities with multiple partners?	Challenges Intimacy and Relationships	What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?

How likely do you think that someone your age gets a STI if they sexual intercourse with a partner with known high-risk sexual behaviors?	Challenges Intimacy and Relationships	What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?
How many sex partners have you had in the past year?	Intimacy and Relationships	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
In the past year, have you only had one main sex partner?	Intimacy and Relationships	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
How long have he/she/they been your main sex partner?	Intimacy and Relationships	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
Since turning 65, how often do you use a condom when you engage in sex (vaginal, oral, or anal)?	Sexual Healthcare and Safer Sex	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
Since turning 65, how often do you talk with your physician about your sexual health, such as STIs/HIV testing, sexual dysfunction?	Talking about Sex	What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?
Since turning 65, how often do you talk about your sexual health with your partner(s)?	Intimacy and Relationships Talking about Sex	What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?
Condoms only prevent pregnancy	Sexual Healthcare and Safer Sex	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
You can tell whether your partner has an STI by physically examining them	Sexual Healthcare and Safer Sex	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
People reduce their chance of contracting an STI by using a condom every time they have sex	Sexual Healthcare and Safer Sex	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
Does Medicare cover STI screening?	Sexual Healthcare and Safer Sex	What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?

Persons over the age of 60 comprise the largest increase of in-office treatments for STIs	Sexual Healthcare and Safer Sex	What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?
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The survey was divided into five sections: Perceived Risk (5 questions), STI Knowledge (5 questions), Sexual Activity (5 questions), Risk Behaviors (5 questions), and Demographics (7 questions). The first portion of the survey was the participant’s perceived risk and susceptibility of contracting an STI of someone in a similar age category. Participants received a possible 0 to 19 points for each response to Questions 1-5. A score of 0 indicated no perceived risk, whereas a score of 19 indicated high perceived risk. The following section of the survey assessed the participant’s STI knowledge. Participants received one point for each correct answer for Questions 6-10. Scores could range from 0 to 5, with 0 being no knowledge of STIs and 5 very knowledgeable of STIs. The next portion was the participant’s sexual activity and history of STI screening, if any. The last portion of the survey assessed participant’s risk behaviors for contracting an STI. This included the number of sexual partners, condom usage, and communication of sexual health with a healthcare professional.

Data Analysis

A total of 155 surveys were completed; 152 in-person on pencil/paper format and 3 online. All data were entered and analyzed using SPSS version 25. Descriptive statistics were obtained to describe the sample, including frequencies, means, and standard deviations of the sample. The manipulation of variables included the creation of an STI knowledge score, which was a sum score with total possible points ranging from 0 to 5. Each correct answer was one point. The perceived risk score was a sum score as well, with total possible points ranging from 0

to 19. Additionally, coding of demographics was required. The risk behavior responses were collapsed to only two answer options instead of four. The ‘everytime’ and ‘sometimes’ responses were collapsed into one answer, whereas the ‘never’ and ‘not sure’ were collapsed into another answer. The data were analyzed via chi-square/correlation tests with a 95% confidence interval to determine any significant relationships. Any significant relationships that were present in each research question was analyzed via multiple linear regression. A collinearity test was completed to verify the model for research questions 2 and 3. Table 3 indicates how each research question was analyzed for this study.

Table 3: Each Research Question and the Statistical Technique that was used Answered it

Research Question	How data will be analyzed
What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?	Sum score Chi-square, Linear regression
What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?	Sum score Chi-square, Multiple-linear regression, Collinearity test
What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?	Collapsing of responses Chi-square, Multiple-linear regression, Collinearity test

Chapter 4: Results

A total of 155 surveys were complete. 152 of the surveys were completed in pencil and paper format, 3 were completed online. The average age of participants was 75 (SD = 6.5) with a range of 65 to 93. A total of 87 males and 66 females completed the survey. Majority of participants identified as White (n = 101), followed by Asian American (n = 17) and African American/Black (n = 17), then Hispanic (n = 8), Pacific Islander (n = 5), Other (n = 5), and finally Native American (n = 3). The most common level of highest education was some college (n = 39) and 106 participants identified their marital status as married. About 27% (n = 42) of the sample stated they were still sexually active. Of those 42 participants, only 15 said they were screened for an STI; however, most of the participants said the STI screening was over three years ago (n = 13). Additionally, a total of 18 participants reported they had been previously diagnosed with an STI. Of those 18 participants, 4 had chlamydia, 10 had gonorrhea, 1 participant had syphilis, and 5 participants had another type of STI. Table 4 provides more demographic data.

Table 4: Demographic Data from Participants Who Completed the Survey

<u>Characteristics</u>	<u>Frequencies</u>	<u>Percentages</u>
Gender		
Male	87	56.8
Female	66	43.1
Race/Ethnicity		
White	101	65.1
African American/Black	16	10.3
Hispanic	8	5.1
Asian American	17	10.9
Native American	3	1.9
Pacific Islander	5	3.2
Other	5	3.2
Medicare Enrollment		
Yes	139	92.1
No	12	7.9
Highest Level of Education		
Less than high school	6	3.8
High school graduate	28	18.1
Some college	39	25.3
2-year degree	25	16.2
4-year degree	22	14.2
Professional degree	27	17.5
Doctorate degree	7	4.5
Marital Status		
Married	106	68.8
Widowed	26	16.8
Divorced	14	10.3
Separated	2	1.2
Never married	5	3.2
Other	1	0.6

Research Question 1: What are the predictors of STI knowledge in persons 65 and older on their sexual risk behaviors in Clark County?

A sum score was calculated to measure participant’s STI knowledge. The average STI knowledge score was 2.59 with a range of 0 to 5, out of a possible 5. The percentage of correct responses to the STI knowledge questions can be found in Table 5. The two questions that participants struggled to answer were related to their age category, persons 65 years of age or older. Only 15% of participants knew that Medicare covered STI screenings (n = 155). Whereas 12% knew that persons over the age of 60 comprise the largest increase of in-office treatments for STIs (n = 155). Approximately 82% of participants had better knowledge related to general topics such as condom usage (n = 155). Women’s average STI knowledge score was 2.5, whereas men’s average STI knowledge score was 2.6.

Table 5: Percentage of Correct Responses to STI Knowledge Questions

STI Knowledge Question	Frequencies	Percentage
Condoms only prevent pregnancy	127	81.9
You can tell your partner has an STI by physically examining them	110	70.9
Persons over the age of 60 comprise the largest increase of in-office treatments for STIs	19	12.2
People can reduce their chance of contracting an STI by using a condom every time they have sex	122	78.7
Medicare covers STI screenings	24	15.4

Pearson chi-square tests were performed between sexual activity, risk behaviors, demographics, and STI knowledge scores to determine if any significant relationships were present. Only one significant relationship was found between the highest level of education and STI knowledge was significant, $\chi^2 (55, N = 155) = 74.53, p = 0.041$. Once further testing was done via linear regression, no significant relationship was found ($F (1, 152) = 2.54, p = 0.11$), with an R^2 of 0.016.

Research Question 2: What are the predictors of perceived risk of contracting an STI in persons 65 and older in Clark County?

A sum score was calculated to measure the participant's perceived risk of contracting an STI at their age. The average perceived risk score was 14.31 with a range of 3 to 19, out of a possible 19. Table 6 indicates the frequencies and percentage of responses to the perceived risk questions.

Table 6: Percentage of Responses to Perceived Risk Questions

<u>Perceived Risk Question</u>	<u>Frequency</u>	<u>Percentage</u>
Since turning 65, how often do think about your chances of get having an STI? (n = 154)		
Never	137	88.9
Occasionally	15	9.7
Frequently	2	1.2
What do you believe are the chances of someone your age getting a STI if they engage in oral, anal, or vaginal sex? (n = 154)		
Very Likely	36	23.3
Somewhat Likely	60	38.9
Not Very Likely	41	26.6
No Chance at all	17	11.0
How likely do you think someone your age can get a STI if they engage in unprotected sex? (n = 154)		
Very Likely	66	42.8
Somewhat Likely	58	37.6
Not Very Likely	25	16.2
No Chance at all	5	3.2
How likely do you think that someone your age can get an STI if they engage in sexual activities with multiple partners (n = 153)		
Very Likely	111	72.5
Somewhat Likely	31	20.2
Not Very Likely	6	3.9
No Chance at all	5	3.2
How likely do you think that someone your age gets a STI if they have sexual intercourse with a partner with known high-risk sexual behaviors (n = 153)		
Very Likely	127	83.0
Somewhat Likely	18	11.7
Not Very Likely	3	1.9
No Chance at all	5	3.2

Pearson chi-square was calculated between STI knowledge, risk behaviors, demographics, and sexual activity, and perceived risk scores to determine if any statistically significant relationships were present. Two statistically significant relationships were discovered between risk behaviors and perceived risk. The first relationship was between length of having one main sex partner and perceived risk, $\chi^2 (56, N = 155) = 95.76, p = 0.001$. The other statistically significant relationship was found between condom usage and perceived risk, $\chi^2 (56, N = 155) = 103.07, p < 0.001$.

In terms of demographics, Medicare enrollment and race/ethnicity had statistically significant relationships with perceived risk, $\chi^2 (42, N = 155) = 128.51, p < 0.001$ and $\chi^2 (140, N = 155) = 182.950, p = 0.009$, respectively. Additionally, one last statistically significant relationship was found via correlation between STI knowledge and perceived risk with, $(\chi^2 (70, N = 155) = 93.24, p = 0.03)$. No statistically significant relationships were found between sexual activity and perceived risk.

Multiple linear regression was calculated to predict perceived risk from risk behaviors, demographics, and STI knowledge based on the chi-square and correlation results presented above. These variables statistically significantly predicted perceived risk, $F (6, 94) = 2.84, p = 0.014, R^2 = 0.100$. This model explains about 10% of the variance, with the STI knowledge score being the most significant ($p = 0.001$). Table 7 provides all the variables within the model and their relative significance.

Table 7: Multiple-Linear Regression Model Examining the Predictors of Perceived Risk of Contracting an STI in Persons 65 and Older in Clark County

Variables	t-statistic	Significance	95.0% Confidence Interval for B	
			Lower Bound	Upper Bound
Length of One Main Sex Partner	-0.608	0.545	-1.102	0.585
Condom Usage	0.638	0.525	-0.431	0.839
Age	-0.457	0.649	-0.096	0.060
Medicare Status	0.359	0.720	-1.560	2.249
Race/Ethnicity	-1.825	0.071	-0.704	0.030
STI Knowledge Score	3.530	0.001	0.350	1.249

Research Question 3: What are the predictors of talking to providers about STI prevention in persons 65 and older in Clark County?

The third research question calculated the predictors of talking to providers about STI prevention in persons 65 and older in Clark County. When asked how comfortable participants were with talking with their physician about their sexual health, 32.6% said they were never comfortable discussing these issues with their physicians. However, 29.1% of the participants said they felt comfortable all the time discussing their sexual health with their physician.

Additionally, when asked how often they talk about sexual health with their physician, 61.3% said they never discussed their sexual health with their physician. Whereas, only 6.8% of participants said they discuss their sexual health every time with their physician. Finally, more men (n = 27) indicated they were more comfortable talking with their physician every time compared to women (n = 15), but both men (n = 47) and women (n = 41) indicated they never talk with their physician about their sexual health. See Table 8 for the results of talking with their physician about sexual health

Table 8: Percentage of Responses to Comfort and Frequency of Talking to Physicians About Sexual Health

Survey Question	Frequency	Percentage
Since turning 65, how comfortable are you talking with your physician about your sexual health, such as STIs/HIV testing, sexual dysfunction?		
Everytime	42	29.1
Sometimes	37	25.6
Never	47	32.6
Not Sure	18	12.5
Since turning 65, how often are you talking with your physician about your sexual health, such as STIs/HIV testing, sexual dysfunction?		
Everytime	10	6.8
Sometimes	38	26.2
Never	89	61.3
Not Sure	8	5.5

This research question calculated the relationship between STI knowledge, sexual activity, and demographics, and comfort of talking with a physician about sexual health. Two statistically significant relationships were present between sexual activity and participants' comfort of talking with a physician about sexual health. The first relationship was between current sexual activity status and comfort of talking about sexual health with a physician, $\chi^2 (18, N = 155) = 170.24, p < 0.001$. The second relationship was between previous diagnosis of an STI and comfort of talking with a physician about sexual health, $\chi^2 (15, N = 155) = 158.75, p < 0.001$. Additionally, many demographics demonstrated statistically significant relationships with comfort of talking with a physician about sexual health, including gender ($\chi^2 (18, N = 155) = 165.16, p < 0.001$), Medicare status ($\chi^2 (24, N = 155) = 172.81, p < 0.001$), race/ethnicity ($\chi^2 (66, N = 155) = 213.115, p < 0.001$), education level ($\chi^2 (72, N = 155) = 219.55, p < 0.001$), and marital status ($\chi^2 (54, N = 155) = 192.65, p < 0.001$).

Additionally, this research question calculated the relationship between STI knowledge, sexual activity, and demographics, and the frequency of talking with a physician about sexual health. The same significant factors in the previous paragraph, were also statistically significant in this question. The statistically significant relationship between current sexual activity status and previous diagnosis of an STI with frequency of discussing sexual health with a physician were as followed, $\chi^2 (15, N = 155) = 171.43, p < 0.001$ and $\chi^2 (15, N = 155) = 169.81, p < 0.001$, respectively. Additionally, many demographics demonstrated statistically significant relationships with frequency of talking with a physician about sexual health, including gender ($\chi^2 (15, N = 155) = 164.72, p < 0.001$), Medicare status ($\chi^2 (20, N = 155) = 166.42, p < 0.001$), race/ethnicity ($\chi^2 (55, N = 155) = 189.48, p < 0.001$), education level ($\chi^2 (60, N = 155) = 191.46, p < 0.001$), and marital status ($\chi^2 (45, N = 155) = 191.08, p < 0.001$).

Multiple linear regression was calculated to predict the comfort of talking with a physician about sexual health from STI knowledge, sexual activity, and demographics. These variables statistically significantly predicted the comfort of talking with a physician about sexual health, $F(7, 124) = 2.39$, $p = 0.025$, $R^2 = 0.069$. This model explains about 7% of the variance, with Medicare status being the most significant ($p = 0.042$).

Table 9: Multiple-Linear Regression Model for Comfort of Talking with Physician About Sexual Health

Variables	t-statistic	Significance	95.0% Confidence Interval for B	
			Lower Bound	Upper Bound
Current Sexual Activity Status	1.808	0.073	-0.016	0.355
STI Diagnosis History	0.586	0.559	-0.178	0.328
Gender	-1.628	0.106	-0.311	0.030
Medicare Status	2.053	0.042	0.012	0.677
Race/Ethnicity	-1.781	0.077	-0.123	0.006
Education Status	0.559	0.577	-0.039	0.071
Marital Status	0.108	0.223	-0.030	0.129

Additionally, multiple linear regression was calculated to predict the frequency of talking with a physician about sexual health. These variables statistically significantly predicted the frequency of talking with a physician about sexual health, $F(7, 127) = 2.79$, $p = 0.010$, $R^2 = 0.086$. This model explains about 8% of the variance, with the current sexual activity status being the most significant ($p = 0.005$), followed by gender ($p = 0.013$).

Table 10: Multiple-Linear Regression Model for Frequency of Talking with Physician About Sexual Health

Variables	t-statistic	Significance	95.0% Confidence Interval for B	
			Lower Bound	Upper Bound
Current Sexual Activity Status	2.866	0.005	0.077	0.422
STI Diagnosis History	1.369	0.173	-0.071	0.391
Gender	-2.523	0.013	-0.358	-0.043
Medicare Status	0.528	0.598	-0.228	0.393
Race/Ethnicity	0.361	0.719	-0.048	0.070
Education Status	0.322	0.748	-0.043	0.059
Marital Status	-0.392	0.695	-0.089	0.060

Chapter 5: Discussion

The purpose of this study was to assess the 65 and older population's knowledge of sexual health and their perceived risk of contracting STIs, as well as the predictors of talking to providers about STI prevention. This study found some relationships between the aforementioned factors. The study's results will be discussed in terms of each research question.

Research Question 1

The first research question aimed to identify the predictors of STI knowledge in persons 65 and older. In terms of overall STI knowledge, participants had, on average, a higher score than was originally expected. Based upon the literature review, many persons who are 65 and older are not sure of condom usages, what sexually transmitted infections are, and how they are contracted (Boskey 2019; Letvak and Schoder, 1996). This study did not show similar results. About 82% of participants were aware that condoms prevent more than just pregnancy, and 79% were aware that condoms reduce contraction rates of STIs. Although participants were able to correctly identify condom usage and how STIs are contracted, only 15% of participants knew that Medicare covered STI screenings. Additionally, only 12% of participants knew that the largest increase of in-office treatments for STIs came from their own age group category. Based upon an analysis of athenahealth's network, in-office treatments of STIs increased 23% between 2014 and 2017 for those 60 years of age and older (Howley, 2018; Cohen, 2018). The results of this study indicated that persons 65 and older are aware of condoms, condom usage, and STIs. The participants were not aware of STIs and STI prevention measures within their age population.

Furthermore, very few studies have been conducted to demonstrate the STI knowledge between men and women. One study found that women were more knowledgeable in terms of

sexuality compared to men (Okuno, Fram, Batista, Barbosa, & Belasco, 2012). In this study, both men and women had a relatively similar knowledge score. Men's mean STI knowledge score was 2.6, with women's average STI knowledge score being 2.5, with a possible score range of 0 to 5. With only 0.1 difference between the two genders, no conclusions can be made as to if one gender is more knowledgeable than the other.

Based on the chi-square analysis, the only predictor of STI knowledge was education level. The general trend observed was that those participants with higher education had a better knowledge score than their counterparts. Overall, based upon the linear regression model no predictors were identified to have an impact on persons 65 and older STI knowledge.

Research Question 2

This research question aimed to identify any predictors of perceived risk of contracting an STI in persons 65 and older in Clark County. Based upon the results of this study, persons 65 years of age and older had, on average, a relatively high perceived risk. In general, participants did not think of themselves as being at risk but thought of someone else their age being at risk if they engaged in risky behaviors. For example, when asked about how often they thought about their chances of contracting an STI, almost 89% said they never thought about that. Whereas when asked about a person their age getting an STI if they engage in sexual activities with multiple partners, almost 73% said it would be very likely for that person to contract an STI. Similar results were observed in another study completed by Denise Pichon who looked at perceived risk of contracting HIV/AIDS (2000). Pichon found that individuals never think about their chances of being exposed to AIDS; however, they believed that someone their age had a very likely chance of getting AIDS if they had sex with multiple partners (Pichon, 2000). In other words, both studies found that persons 65 and older do not think of themselves as being of

high risk for contracting an STI or AIDS; however, if phased in the right context, they perceive others individuals their age at being of higher risk of contracting an STI or AIDS.

A chi-square and linear regression analysis were done to analyze the impact of STI knowledge, risk behaviors, sexual activity, and demographics on perceived risk. Based on the model, these predictors predict perceived risk. The model explained about 10% variance, with the STI knowledge score being the most significant with a p-value of 0.001. None of the other variables demonstrated a strong significance; therefore, STI knowledge is a strong predictor of perceived risk within this population. Therefore, those who are more aware of sexually transmitted infections, how they are contracted, and prevention measures would be more aware of the risk associated with contracting an STI if they were to engage in sex with multiple risk behaviors.

Research Question 3

The third and final research question aimed to identify the predictors of talking to providers about STI prevention in persons 65 and older in Clark County. Previous studies have indicated an inverse relationship between acknowledging sexual history and the age of the patient (Ports, Barnack-Tavlaris, Syme, Perera, & Lafata 2014). Many other studies have found similar results, in which physicians, or other healthcare professionals, do not discuss sexual health with patients who are older (Xu, Schillinger, Aubin, St. Louis, & Markowitz, 2001). This study's results agree with previous studies. When asked how often participants spoke with their physician about sexual health (STIs, STI prevention, sexual dysfunction, etc.) 61% said they never do.

Additionally, when asked how comfortable participants felt about talking with their physician about their sexual health, 32% said they were never comfortable, whereas 29% said

they were comfortable every time discussing this topic. Men were more comfortable talking with their physician about sexual health than women. Based upon the literature review, many women said they had a very low comfort level when discussing their sexual health with their physician (Morton, Kim, & Treise, 2011). This study agrees with those previous findings.

Based on the regression model, Medicare enrollment was the strongest predictor of how comfortable participants were discussing their sexual health with a physician. Those participants with Medicare are more likely to visit their physicians regularly compared to those without insurance, so they would be more comfortable or willing to discuss their sexual health with their physician. Furthermore, current sexual activity status and gender were the strongest predictors of how often participants talked about their sexual health with a physician. Those participants that are currently sexually active are more likely to discuss their sexual health with a physician, versus those who are not sexually active. Additionally, men tend to frequent the physician's office more as they age due to physiological factors that impact sex, such as erectile dysfunction (Purposa, 2012). Therefore, men may discuss their sexual health with physicians more than women. In this study, although most men and women stated they never discuss their sexual health with a physician, men did have a greater response rate ($n = 28$) of sometimes discussing sexual health with a physician as compared to women ($n = 10$). In other words, men discuss their sexual health with a physician more often than women, as well as maintain their sexual activities longer.

Limitations and Threats to Validity

As with all studies, this study had some limitations among which include the small sample size. Due to the pandemic, data collection had to be done differently from what was originally planned. Not a lot of people, especially those 65 years of age and older, were not going

to their usual doctor's appointments or leaving the house for that matter, which resulted in a small sample size.

Additionally, a unique population was sampled for this project as data collection occurred in a physician's office. By sampling a group of persons 65 and older at a cardiologist's office, those individuals could have been more aware of their sexual health status. As such, the participants were potentially more aware of their sexual health than other 65 and older persons who do not frequent the doctor as often. The sample obtained for this study was a highly educated sample with a majority of participants completing some sort of college. These results may not reflect the overall educational levels of persons 65 years of age and older in Clark County. Furthermore, the sample obtained for this study does not reflect the diversity of Clark County. For example, a limited number of Hispanics completed the study, which may be due to cultural reasons; therefore, the results may be different if more Hispanics completed the study.

By doing data collection at a physician's office a potential threat to external validity was social desirability. Although the physician had no impact or participation within the study, participants may have responded to the questions in a way that they believed the physician or researcher wanted them to. Social desirability was minimized by clearly stating within the consent form that the residing physician had no relations to the study or the survey that participants were asked to complete. However, participants may have skimmed that portion of the consent form, or just felt as though they needed to respond a particular way because they were in a physician's office.

The last limitation within this study was the word-choices of a few questions. Some of the questions had difficult verbiage for some participants to understand, as well as how to respond to certain questions. For example, one question asked, "In the past year, have you only

had one main sex partner?” Some participants struggled to answer this because their partner had been deceased, but he/she was their main sex partner throughout their life. Therefore, some clarification was needed by some participants. Another question’s answer choices did not coincide with the question being asked. This question asked participants “Since turning 65, how comfortable are you talking with your physician about your sexual health?” but the answer choices were “Everytime”, “Sometimes”, “Never”, and “Not Sure.” Some participants asked for clarification in terms of how to answer that question. These issues with the wording may have affected the way some participants responded.

Chapter 6: Conclusion

Although this study had its limitations, it is one of the few that studies sexual health within the 65 and older population. This study assessed the 65 and older population's sexual health knowledge, their perceived risk of contracting an STI, and their risk behaviors. The findings of this study indicate a few predictors that impact sexual health of those 65 years of age and older. Although no strong predictors were identified in STI knowledge, this study does show that persons 65 years of age and older still need to improve their knowledge in terms of sexual health within their population. Participants knew that condoms prevent more than just pregnancy but were still not using a condom when engaging in sexual intercourse. It is, therefore, important to demonstrate proper safe sex practices to this population.

Additionally, participants' STI knowledge was a predictor of their perceived risk of contracting a sexually transmitted infection. However, their perceived risk of contracting an STI was very different than their perceived risk of someone else their age contracting an STI. In other words, the individual did not think they were susceptible, but thought other people their age was. In doing so, participants are not aware that some of the risk behaviors they are engaging in can impact them. Once again, it is important to help this population realize they are at risk of contracting an STI, especially if they are engaging in risky sexual behaviors.

Finally, this study showed the lack of comfort and frequency of sexual health discussions between persons 65 years of age and older and their physicians or other health care professionals. Ageist attitudes are common among healthcare professionals, especially in terms of sexual health of those 65 and older (Jennings, 2015). This study demonstrated that participants are not discussing their sexual health with their physician, which is a potential risk factor for contracting an STI (Ports, Barnack-Tavlaris, Syme, Perera, & Lafata 2014; Crawford, 2017). Overall,

persons 65 years of age and older are somewhat aware of STIs in general but are not aware of them within their age group. With this being said, efforts should be made into assisting these individuals to learn about the importance of safe sex practices.

Future research should further assess sexual health within the 65 and older population. As noted, a limitation of this study was a small sample size and the type of individuals completing the study. Persons who completed the survey were in a physician's office, so they were a part of a unique population that may have been more aware of their overall health status. Completing future studies within different areas of Clark County, as well as with a more racially diverse group would allow for an examination of the difference in their STI knowledge, perceived risk, or risk behaviors that were not represented by this study's sample. Additionally, future research should study the health care professional's ageist attitudes and how they share safe sex practices with their older patients. This study showed that individuals do not talk frequently with their physician about their sexual health. Further study is needed to determine if that is the choice of the patient or if the physician does not give the patient the option based on the assumption that the patient is not engaging in sexual activities anymore due to their age. To combat ageist attitudes towards the sexual health of persons 65 years of age and older, students in professional health schools may need more specific training related to sexual health and safe sex measures of this population.

Appendix



INFORMATION SHEET Department of Environmental and Occupational Health

TITLE OF STUDY: SEXUALLY TRANSMITTED INFECTIONS AND THE 65 AND OLDER
POPULATION: KNOWLEDGE AND PERCEIVED RISK
INVESTIGATOR(S) AND CONTACT PHONE NUMBER: Melva Thompson-Robinson, DrPH,
Alexus Miranda; (702)-985-9102

The purpose of this study is to use the Sexual Health Model to examine the relationship between various predictors, perceived risk of STIs, STI knowledge, and other barriers that impact persons 65 years of age and older sexual health, in particular sexually transmitted infections (STIs). You are being asked to participate in the study because you meet the following criteria: Aged 65 years or older and reside in Clark County.

If you volunteer to participate in this study, you will be asked to do the following: Complete a pencil and paper survey related to your sexual health knowledge, such as sexually transmitted infections (STIs), sexual risk behaviors, sexual history, and perceived risks associated with sex at your age.

Voluntary Participation

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You do not have to complete the survey in its entirety or you can skip any questions you do not wish to answer. The completion of this survey and submission back is part of your consent to participate. If you have any questions about the survey, you may contact Dr. Melva Thompson-Robinson at melva.thompson-robinson@unlv.edu or Alexis Miranda at mirana7@unlv.nevada.edu or (702)-985-9102.

Questions in this survey are asking about your sexual health knowledge, such as sexually transmitted infections (STIs), sexual risk behaviors, sexual history, and perceived risks associated with sex at your age.

Participation in this study is not related to the physician or to your appointment today. Participation does not hinder your appointment time with the physician. Dr. Cres Miranda, M.D., F.A.C.C., F.A.C.P., F.S.C.A.I., does not have any responsibility within this study.

This study includes only minimal risks. The study will take 20 minutes of your time. You will not be compensated for your time.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-581-2794, or via email at IRB@unlv.edu.**

Your participation in this study is voluntary. You may withdraw at any time. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Consent:

I have read the above information and agree to participate in this study. I am at least 18 years of age.

Do you live in Clark County?

Yes

No

Are you 65 years of age or older?

Yes

No

If you have answered "No" to any of the previous questions, please stop the survey now.

If you have answered "Yes" to all of the previous questions, please continue with the remaining questions.

Thank you.

Perceived Risk: This section asks questions regarding your perceived risk of contracting an STI. Please answer to the best of your ability.

1. Since turning 65, how often do you think about your chances of getting or having an STI?

- Never
 - Occasionally
 - Frequently
-

2. What do you believe are the chances of someone your age getting a STI if they engage in oral, anal, or vaginal sex?

- Very Likely
 - Somewhat Likely
 - Not Very Likely
 - No Chance at All
-

3. How likely do you think that someone your age can get a STI if they engage in unprotected sex?

- Very Likely
 - Somewhat Likely
 - Not Very Likely
 - No Chance at All
-

4. How likely do you think that someone your age can get an STI if they engage in sexual activities with multiple partners?

- Very Likely
 - Somewhat Likely
 - Not Very Likely
 - No Chance at All
-

5. How likely do you think that someone your age gets a STI if they sexual intercourse with a partner with known high risk sexual behaviors?

- Very Likely
 - Somewhat Likely
 - Not Very Likely
 - No Chance at All
-

STI Knowledge: This section tests your STI knowledge. Please answer to the best of your ability.

6. Condoms only prevent pregnancy

- True
 - False
 - I don't know
-

7. You can tell whether your partner has an STI by physically examining them

- True
 - False
 - I don't know
-

8. Persons over the age of 60 comprise the largest increase of in-office treatments for STIs

- True
 - False
 - I don't know
-

9. People can reduce their chance of contracting an STI by using a condom every time they have sex

- True
 - False
 - I don't know
-

10. Medicare covers STI screenings

- True
- False
- I don't know

Sexual Activity: This next section asks questions regarding your sexual activity. Please answer truthfully and to the best of your ability.

11. Are you currently sexually active? Sexually active includes engaging in sexual relations, such as oral, anal, or penetrative sex.

Yes

No

12. If you have selected "No" to Question 11, please skip to Question 14. If you have selected "Yes" to Question #11, please answer the following question: Have you ever been screened for an STI?

Yes

No

I don't know

13. If you have selected "Yes" to Question #12, please answer the following question: When was the most recent screening?

Less than three months ago

Three to six months ago

Six months to a year ago

Over a year ago

Over three years ago

14. Have you ever been diagnosed with a sexually transmitted infection (STI), such as chlamydia, gonorrhea, or syphilis?

Yes

No

15. If you have selected “No” to Question #14, please move onto the next section. If you have selected "Yes" to Question #14 please answer the following question: What STI were you diagnosed with

Chlamydia

Gonorrhea

Syphilis

Other

Risk Behaviors: The next section asks questions regarding potential risk behaviors. Please answer truthfully and to the best of your ability.

16. In the past year, have you only had one main sex partner?

Yes

No

17. If you have selected "Yes" to Question #16 please answer the following question: How long have he/she/they been your main sex partner?

- Less than three months
 - Three to six months
 - Six months to a year
 - More than a year
-

18. If you have selected "No" to Question #16 please answer the following question: How many sex partners have you had in the past year?

- 0
 - 1-3
 - 4-7
 - 8-10
 - 10 or more
-

19. Since turning 65, how often do you use a condom when you engage in sex (vaginal, oral, or anal)?

- Everytime
 - Sometimes
 - Never
 - Not Sure
-

20. Since turning 65, how comfortable are you talking with your physician about your sexual health, such as STIs/HIV testing, sexual dysfunction?

- Everytime
 - Sometimes
 - Never
 - Not Sure
-

21. Since turning 65, how often are you talking with your physician about your sexual health, such as STIs/HIV testing, sexual dysfunction?

- Everytime
 - Sometimes
 - Never
 - Not Sure
-

22. During these conversations, who initiates the conversation of sexual health?

- Myself
 - My partner
 - The physician or nurse
 - Other family member
 - Other _____
-

23. Since turning 65, how often do you talk about your sexual health with your partner(s)? Such as history of STIs, condom usage, number of sex partners, etc.

- Everytime
 - Sometimes
 - Never
 - Not Sure
-

Demographics

24. What is the reasoning for your visit today?

- General Follow-up Appointment
 - Medication Refill
 - Sexual Health Issue (Sexual dysfunction, Erectile dysfunction, Lack of sexual desire)
 - Other _____
-

25. What is your age?

26. What is your gender?

- Male
 - Female
 - Transgender
 - Prefer not to answer
-

27. Are you currently enrolled in Medicare?

- Yes
 - No
-

28. Which of the following best describes your race/ethnicity

- African American/Black
 - Pacific Islander
 - Native American
 - White
 - Hispanic
 - Asian American
 - Other
-

29. What is the highest level of education you have completed?

- Less than high school
 - High school graduate
 - Some college
 - 2-year degree
 - 4-year degree
 - Professional degree
 - Doctorate degree
-

30. What is your current marital status?

- Married
 - Widowed
 - Divorced
 - Separated
 - Never married
 - Other
-

Thank you for your participation and time completing this survey. If you have any questions or concerns, feel free to contact Alexis Miranda at mirana7@unlv.nevada.edu or Dr. Melva Thompson-Robinson at melva.thompson-robinson@unlv.edu.

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