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Assessing Beliefs, Attitudes, and Perceived Risks of HIV as Predictors of HIV Testing Behavior Among Seniors in the Coachella Valley, California

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ASSESSING BELIEFS, ATTITUDES, AND PERCEIVED RISKS OF HIV AS PREDICTORS OF HIV TESTING BEHAVIOR AMONG SENIORS IN THE COACHELLA VALLEY, CALIFORNIA

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We hereby certify that this dissertation, submitted by Gillian A. Sealy, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirement for the degree of Doctor of Philosophy in Health Science.

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Abstract

According to the Centers for Disease Control and Prevention (CDC) (2017), at the end of 2014, approximately 428,724 people 50 years or older were diagnosed and living with HIV in the United States. A contributing factor to the high incidence of HIV in this population is unknown HIV/AIDS serostatus (Fenton, 2007). The U.S. Department of Health and Human Services (2018), terms serostatus as the state of having or not having detectable antibodies against a specific antigen (https://aidsinfo.nih.gov/understanding-hiv-aids/glossary/1632/serostatus). Contributing to the lack of knowledge about HIV serostatus, is that those over 50 are less likely to be tested for HIV even when engaging in sexually risky behavior and may underestimate their risk for acquiring the disease (Pilowsky & Wu, 2015) This dissertation research study will examine how people over the age of 50 perceive their risks for contracting HIV and the reasons why they are or are not getting tested for the disease. The study will also assess whether there is a difference in HIV testing behavior among those 50, 60, 70 and 80+ years of age. Finally, this research will evaluate whether there is a relationship between obtaining a routine health screening like cholesterol, diabetes or blood pressure and the likelihood of seniors in the Coachella Valley, California getting a HIV test. This is a cross sectional study using secondary data from the Health Assessment and Research for Communities (HARC) with variables and related data being analyzed using frequency analyses and logistic regression.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

The Human Immunodeficiency Virus (HIV) is often viewed as a disease that impacts young people and those who engage in risky sexual and other behaviors like drug abuse (Brooks, Buchacz, Gebo, & Mermin, 2012). Increasingly however, this thinking is evolving into a false narrative. In fact, seniors over the age of 50 are less likely to be viewed as being at risk for HIV, thus less likely to be tested or asked about getting a HIV test which further contributes to the rising numbers of seniors infected with the disease. The Centers for Disease Control and Prevention (CDC) reported that in 2008, there were approximately 862 HIV cases in individuals aged 65 and over, 1,140 cases in those aged 60-64, 2,242 cases in those aged 55-59, and 3,946 cases in those aged 50-55 (CDC, 2013). This again underscores the rising rates of HIV among this population with the following reasons for the rise due to seniors being less likely to be tested or to seek testing for HIV given their own perception that they are not at risk for contracting the disease (Pilowsky & Wu, 2015). Individuals' perceptions about their own health risks can be helpful in explaining their lack of self-protective behavior. Theoretical frameworks like the Health Belief Model (HBM) have been used by researchers to understand and predict health behaviors, and it has been used as a tool in disease prevention (Glanz, Rimer, & Lewis, 2002). For this study. the components of the HBM were used as a theoretical framework to explain why seniors in this study might or might not engage in self-protective behavior as it relates to HIV testing among seniors in the Coachella Valley, California.

HIV surveillance data from 2014 estimated that seniors over the age of 50 diagnosed with HIV was at 42%. This was an increase over 2010, when rates were estimated at 35% for seniors over the age of 50 living with the disease (CDC, 2016). In 2013, along racial and ethnic lines, HIV rates among people over the age of 50 showed that the largest percentage of those affected

was among African Americans (40%). Among the remain groups, the percentages were 38% whites, 17% Hispanic and 1% Asian with less than 1% each for American Indian/Alaska Native and Native Hawaiians/other Pacific Islanders (CDC, 2016). This illustrated that the highest burden of disease felt by those over the age of 50 seemingly falls along racial/ethnic lines with African Americans sharing the highest burden.

According to the CDC (2017c), geographical disparities data from 2010 showed that the highest rates of newly diagnosed AIDS cases were in the Northeast (14.2/100,000), followed by the South (13.0/100,000), and the West (8.8/100,000). In 2009, among the 50 states, the South accounted for 48% of the 17,774 deaths among people diagnosed with AIDS; the Northeast accounted for 24%, the West accounted for 17%), and the Midwest accounted for 11%], (CDC, 2017c). While the west is the not the location with the most HIV-related deaths, this location is still heavily affected by the HIV virus. As this research study is centered on HIV testing among seniors in the Coachella Valley, California, rates in California were also examined. From 2011 to 2015 there was an increase in people living with HIV from 118,000 to over 128,000. In 2015, the prevalence rate of diagnosed HIV infection cases was 330.1 per 100,000 population compared to 313.8 in 2011(California Department of Public Health, Office of AIDS, 2015).

HIV prevalence in Riverside County, where the Coachella Valley is located, "is 67 percent higher and AIDS is 500 percent higher than the national average" (Pelham, 2013, para. 2). Compounding these dire statistics is that according to the CDC (2008), one in five people do not know they were infected with the HIV virus. Additionally in 2013, the CDC reported that HIV rates had been increasing for seniors over the age of 50 (CDC, 2008).

The rise in HIV rates among seniors can be attributed to a variety of reasons. According to Lindau, Leitsch, Lunberg, and Jerome (2006), as post-menopausal women no longer require

birth control, they may not be consistently using condoms during intercourse and practicing safe sex, which might provide some explanation of a rise in HIV among these groups. Neundorfer, Harris, Britton, & Lynch, (2005) further posited that in addition to the decrease in condom use in menopausal women, it has also been shown that women have difficulty negotiating sexual safety as they seek a desire for relationships that provide male companionship. Since sexual activity does not decrease with age and given that seniors are less likely to be tested for HIV even when engaging in sexually risky behavior (Lindau, Leitsch, Lunberg, and Jerome 2006), there are implications for dismissing and not educating this population on the need for HIV testing, diagnosis, and early treatment of the disease. In addition to the aforementioned reasons for increases in HIV rates among older Americans, additional reasons have not been extensively studied (CDC, 2013). However, there are some additional reasons that have been proposed to explain the phenomenon. According to Levy, Ory, and Crystal (2003), the recently divorced or widowed who were previously in long-term monogamous relationships often do not see themselves at risk for HIV even when starting new relationships. Levy et al. explained that these women are often less likely to use consistent forms of protection like condoms.

Another example of the amplified HIV risk among older Americans is the 2008 National Survey on Sexual Health and Behavior which highlighted that with all people over the age of 50 who participated in the survey, condoms were not used during the most recent sexual encounter, with respondents reporting these encounters to be with casual partners (91.5%), friends (76%), new acquaintances (69.9%), and transactional encounters (33.3%) (Schick, Herbenick, Reece, Sanders, Dodge, Middlestadt, et al., 2010).

Researchers who study the elderly and HIV rates use various terms when referring to seniors and/or the elderly and aged. Roebuck (1979) explained that in 1875 in Britain through the

Friendly Society Act, the definition of old age was anyone over 50 even as the country's pension schemes used 60 to 65 years of age for eligibility. The World Health Organization (WHO; 2016) provided a working definition of older or elderly as 50 years of age or older. While there had been commonly used terms for old age, there was no general agreement or consensus on what constituted old age. Most pension schemes used between 60 and 65 as an identifier of old age, and some countries defaulted to this age range to signify old age as it often relates to retirement age (Kowal & Peachey, 2001). Gorman (1999) suggested that while age is a biological function that is outside of human control, it is also a construct of what societies believe make sense when referring to old age. Gorman also offered that in developed countries, life stages are marked by chronological age, while in developing countries, old age is seen as the beginning point when being able to actively contribute to society is no longer possible. According to Kowal and Peachey (2001), at the Minimum Data Set conference in 2000, participants agreed to use the chronological age of 60 to define old age. However, it was later decided at the same conference that 50 years of age and older better represented "old age" especially in Sub Saharan Africa and this age category was believed to better represent a realistic working definition of old age (Kowal & Peachey, 2001). Other researchers have operationalized older Americans as 50 years of age and older (Brooks et al. (2012). For the purpose of this research study on HIV testing behavior, the terms senior, elderly, and aged refer to persons over the age of 50.

HIV is spread through bodily fluids that affect specific cells in the immune system-specifically, the CD4 or T cells (US Department of Health & Human Services, 2017). This process prevents the body from being able to fight off infections and disease due to the weakened immune system (U.S. Department of Health & Human Services, 2015). The CDC (2017c) posits that 1 in 8 people (12.8% are unaware that they are infected (CDC, 2017c).

While researchers generally refer to seniors as those over the age of 50, statistics indicate that additional new HIV cases are being diagnosed in those over 65 (CDC, 2016). In a study evaluating the progression of HIV in patients over the age of 50 diagnosed with HIV and in treatment, the researcher found that age was an independent prognostic factor affecting the clinical progression of AIDS or death (Egger, 2002). Given that advanced age can result in the accelerated progression of the disease, it is even more imperative that seniors be tested and linked to care early.

With senior populations living longer, it is expected that not only will they engage in sexual activity, but unsafe sexual activity could potentially put them at increased risk for HIV, making it imperative to develop interventions to decrease HIV transmission (Nguyen & Holodniy, 2008). Given what is known about HIV, how it is transmitted and how attitudes and belief about perceived risk can dictate self-protective or lack therefore, this research study conducted an examination of the knowledge, attitudes, and beliefs about HIV among seniors in the Coachella Valley, California. In addition, an analysis of Coachella Valley seniors' perceived risk for contracting HIV as well as the role that routine health screenings like cholesterol, and diabetes might play as predictors for HIV testing behavior among seniors, a correlational analysis was also conducted. Results of this research study can inform and support effective and comprehensive public health programs that (a) educate seniors on the transmission pathways for HIV; (b) dispel myths about HIV infection among seniors; and (c) implement policies and recommendations to address HIV prevention in this demographic.

More testing and educational information has increased awareness about HIV and AIDS for the general U.S. population. In 2010, then President Barack Obama developed a comprehensive National HIV/AIDS Strategy that outlined four key objectives: (a) to reduce new HIV infections;

(b) to increase access to care and improve health outcomes for people living with HIV; (c) to reduce HIV-related disparities and health inequities; and (d) to achieve a coordinated national response to HIV/AIDS (Health Resources and Services Administration [HRSA], 2015).

According to HRSA (2015), the strategy called for a coordinated, multi-pronged comprehensive approach to addressing HIV/AIDS in communities across the United States, specifically connecting those infected to care as early as possible. In addition, a provision was made to provide the uninsured under the Affordable Care Act with improved access to insurance coverage specifically allowing people with pre-existing conditions including HIV/AIDS to obtain coverage. (HRSA, 2015).

The U.S. White House HIV strategic plan encouraged the examination of HIV rates among disparate and vulnerable populations and called for a more intent focus on those populations and communities where there are increases in HIV (White House Office of National AIDS Policy [ONAP], 2015). The term "disparate and vulnerable populations" is traditionally used for ethnic and racial groups like African American and Latino populations; however, given the increasing rates of HIV in the elderly, this age group should also be viewed as a vulnerable or disparate population.

Age appears to be a predictor for HIV testing among different age groups. For instance, examining more closely those residents in the Coachella Valley who were tested for HIV, there were differences by age group—62% of adults aged 35 to 44 were likely to be tested when compared to 53% of those aged 25 to 34 (HARC, 2014). The numbers decreased even more significantly for young people aged 18 to 24 at 39% while elderly residents over the age of 70 were only being tested at a rate of 8% (LeComte-Hinely, 2014; HARC, 2014).

Researchers have suggested various reasons for why seniors are less likely to get an HIV test than their younger counterparts, even when those seniors are engaging in risky sexual behavior. For example, Nguyen and Holodniy (2008) found that reasons included perceived level of risk for contracting the disease, seniors' beliefs and knowledge about HIV, health care professionals not routinely testing seniors for the HIV virus, and misdiagnoses in the early stages of the disease because early symptoms can appear to be normal signs of the aging process. There are also complex socioeconomic factors that drive the lack of HIV testing in disparate and vulnerable populations including lack of access to medical care and insurance, discrimination, stigma, and poverty (CDC, 2015c). Specifically, as it relates to the social conditions of discrimination, poverty and stigma, this can result in delays in seeking treatment when tested positive for the disease which in turn has a negative impact on HIV treatment adherence (Basta, Shacham, & Reece, 2009; Peretti-Watel, Spire, Pierret, Lert & Obadia, 2006),

The Get Tested Coachella Valley (GTCV) campaign is a region-wide public health campaign which grew out of a need to address the high prevalence of HIV among residents in the Coachella Valley, California (LeComte-Hinely, 2014). The campaign was initiated in 2013 and follows the CDC universal guidelines for HIV testing (HARC, 2014). The CDC recommends HIV testing for everyone between the ages of 13 and 64 years of age at least once as part of a routine healthcare screening in all healthcare settings (CDC, 2013). The aim of this public health campaign was to dramatically decrease the prevalence rates of HIV, to make HIV testing a routine and voluntary part of medical practice, and when HIV/AIDS is diagnosed, to ensure that there are early linkages to care.

It is anticipated that in addition to making HIV testing a routine part of medical practice, when HIV/AIDS is diagnosed, it will result in needed and early medical interventions like anti-

retroviral medications as appropriate (HARC, 2015). In general, the added benefit of educating the population as well as encouraging people to know their serostatus (as outlined in the goals of the U.S. White House's HIV Strategy) could potentially result in significant behavior change, such as a reduction in risky sexual behavior and an increase in HIV testing especially among seniors (HRSA, 2015). These at-risk behaviors can include having multiple sexual partners, having unprotected sex, or having sex while under the influence of alcohol or drugs (CDC, 2010). Behavioral and social science researchers on HIV agree that preventing the acquisition and transmission of HIV is rooted in one or more behavioral components that can influence its efficacy (National Institutes of Allergy and Infectious Disease [NIAID], 2017). Theoretical models like the HBM, which is a conceptual framework that scientists use to predict health behaviors, can often be used to develop strategies to develop effective public health, health education, and health promoting campaigns (Glanz et al., 2002). An analysis of the HBM and seniors perceived risks of contracting HIV can provide insight into the HIV testing behaviors among this group and the development of appropriate interventions.

Statement of the Problem

The prevalence of HIV among the elderly is increasing. However, providing HIV prevention education is important to 1) preventing HIV transmission; and 2) ensure early intervention and treatments if HIV status is positive. In this research study, the examination of how seniors in the Coachella Valley, California, perceive their risk for contracting HIV, as well as their knowledge, attitudes, and beliefs about the disease and HIV testing behavior among this demographic. Knowledge and attitudes about risk as well as testing behavior were assessed by examining secondary data collected by HARC and the GTCV campaign.

Seniors have misconceptions about contracting HIV as they believe they are not at risk for contracting the disease. This belief can put them at greater risk for HIV contraction if not using self-protective methods when engaging in sexual intercourse. For instance, some studies suggest that in post-menopausal women, because of the decreased levels of estrogen, that this can result in a thinning of the vaginal epithelium and decreased mucus production. This can make the tissue more susceptible to abrasions and facilitate HIV infection (Meditz, Moreau, MaWhinney, et al., 2012). Additionally, data also suggests that the cervix in post-menopausal women might go through immune changes that become favorable to HIV infection especially when these tissues become more enriched with target cells e.g. CD4+ and CCR5+ T cells (Meditz, et al., 2012). It should also be noted that the co-morbidities like cancer and cardiovascular disease can be exacerbated from HIV disease and are often more serious in older adults, not to mention the psychological stresses involved with such a diagnosis (Brooks et al., 2012).

While some sexual activity decreases with age, Lindau et al. (2007) found that the majority of Americans between 57 and 65 as well as a portion aged 66 and over remain sexually active. This number includes those who might be HIV positive and unware of their serostatus. Due to the lack of knowledge about serostatus in conjunction with at-risk behaviors, there has been in recent years increased calls for effective prevention programs, including discussions at a U.S. White House summit in 2010 on HIV and aging (ONAP, 2015).

Public health interventionists and medical providers seek to test and then change behavior. Studies (Hormik, 2002) have indicated that social marketing campaigns have been very successful in international countries, for example the use of mosquito nets to prevent malaria. However, some social marketing campaigns in the United States appear to have had less of an

impact (Hormik, 2002). Additionally, it has been noted by public health and social scientists that even though some public health programs (e.g., seatbelt use, healthy eating, and anti-smoking campaigns) have been successful in changing behavior, they may not be as effective for certain subgroups of a population, meaning they may be disproportionately impacted by the disease or risky behavior. For instance, when looking at such campaigns more closely, especially across demographic lines, African Americans and Latinos are still disproportionately affected by obesity, comorbidities associated with lack of exercise and chronic diseases, and unintended injuries due to lack of seatbelt use (Hormik, 2002). Despite education, information and research about HIV and AIDS, the same conclusion could be drawn for why seniors are not being tested for HIV and for the increasing incidence of HIV among this group despite education about how HIV is spread and its deleterious effects. Understanding the motivation for behavior change in a particular group as well as understanding why and how some groups are considered more vulnerable for contracting HIV can assist in developing an effective model to combat the disease (Andersen & Davidson, 2007). Considering the attitudes, beliefs, and knowledge about HIV and identifying predictors about HIV testing behavior among seniors in the Coachella Valley, can add to the knowledge about testing behaviors among seniors in the United States.

Practical Applications of Research Findings

It is anticipated that the data presented in this research study can be used to aid communities, healthcare professionals, and policy makers in developing and implementing successful public health campaign models that can result in significant HIV testing behavior change. In addition, replicating a successful HIV testing model can also result in the development of successful strategies that target those disproportionately affected in other areas of disease such as chronic disease, maternal and infant mortality, and unintended injuries. The approach to identifying

barriers that inhibit specific groups from accessing resources that would result in advantageous behavior change is vital to improving health indicators (Glanz, Rimer, & Lewis, 2002).

Relevance and Significance

The CDC recommends universal opt-out HIV testing for all persons from aged 13 to 64 in an effort to decrease the number of persons who are unaware of their HIV status and to provide linkages to care for those infected (CDC, 2013). However, the CDC does not specifically recommend universal opt-out HIV testing for those 65 years old and over. According to Sanders, Bayoumi, Holodniy, and Owens (2008) the HIV prevalence among this group does not make generalized testing cost effective. However, with the rising rates of seniors testing positive for HIV, the healthcare costs of treating someone in the late stages of the disease could warrant a revision of the recommendation.

A better understanding of what challenges exist that prevent seniors from being tested for HIV, assessing predictive behavior around HIV testing, and then developing programs and policies that encourage this age group to be tested can have implications for decreasing the HIV prevalence among seniors.

Theoretical Foundation

There have been many theoretical perspectives used in HIV/AIDS health promotion, disease prevention, and research. Some of these theoretical frameworks include: The Theory of Planned Behavior (Ajzen & Madden, 1986), AIDS Risk Reduction Model (Catania & Kregels, 1990), The Theory of Reasoned Action (Fishbein, Middlestadt, & Hitchcock, 1994) and the Health Belief Model or HBM as it is often termed (Rosenstock, Stretcher, & Becker, 1988). Many of these models have been used to understand diseases like HIV as well as understanding why some people engage in self-protective behavior while others do not. The tenets of these

theories often overlap when examining behaviors, attitudes, beliefs, and intentions about a disease or disease prevention. Depending on the theory, some look at long-term behavior change while others assess short-term behavior change. The HBM is typically used to determine screenings and prevention. For the purposes of this research study, the Health Belief Model was used as the theoretical framework to understand HIV testing behavior among seniors.

HBM is most often used in health education and health promotion, was developed in the 1950s, and popularized by the United States Public Health Service to understand the failure of screening programs like screening for tuberculosis (Hochbaum, 1958). HBM is a psychological model that attempts to explain and predict an individual's health behavior. The underlying foundation of the HBM is that health behavior is determined by a person's beliefs about a particular disease and the strategies that are available to lessen its occurrence (Hochbaum, 1958). There are four constructs that make up the HBM:

- Perceived Susceptibility
- Perceived Severity
- Perceived Benefits
- Perceived Barriers

These constructs are used to explain health behavior. Additional constructs were added to the model to include cues to action, motivating factors, and self-efficacy (McCormick-Brown, 1999).

Perceived Susceptibility. Susceptibility is one of the more compelling perceptions that influences individuals' choices to lead healthier lives. The greater the perception of risk, the more motivated an individual is to mitigate that risk. According to Belcher, Sternberg, Wolotski, Halkitis, and Hoff (2005), an example of perceived susceptibility is what prompts men having

sex with men to use condoms in an effort to decrease the susceptibility of contracting HIV. When people perceive they are at great risk for contracting a disease, they are more likely to do something about it. Conversely, if people do not believe they are at risk or believe the risk to be minimal, they are less likely to take preventive measure to minimize such risk. Maes and Louis (2003) suggested that this is especially true for older people and HIV prevention behavior. Because older adults do not see themselves as being at risk for contracting HIV, safer sex is not practiced consistently. Perceived susceptibility, when coupled with the seriousness of a particular disease, results in the person perceiving a threat (Stretcher & Rosenstock, 1997). Perceived threats tend to occur when there is real risk of serious disease, often resulting in behavior change. Mullens, McCaul, Erickson, and Sandgren (2003) pointed to colon cancer as an example of a perceived threat. Behavior change can be observed in colon cancer survivors because colon cancer is a serious disease that has a high rate of recurrence. In short, when people have been previously treated for a disease, they are more likely to change their behavior, such as making changes in diet, exercise, and weight.

Perceived severity. Perceived severity relates to an individual's belief about the seriousness or severity of a disease. A person's belief about a disease can come from medical information but can also be attributed to the perceived effects they view it will have on their health and lives (McCormick-Brown, 1999). An example of this would be in the case of sexually transmitted infections (STIs) which are universally regarded by the medical profession as harmful to one's health. Although this is a widely held view among medical professionals as a serious disease, an individual must decide whether STIs are a risk to them personally.

Perceived benefit. Perceived benefit refers to a person's belief about the benefits or usefulness of a new behavior that decreases the likelihood of developing a disease. Behavior

change is likely to occur if people believe that the new behavior will decrease the chance of getting the disease (e.g., someone quitting smoking because of the belief that it improves their health). Perceived benefits are especially important in encouraging people to adopt screening behaviors. However, for health screenings (e.g., colonoscopy, mammograms) to be adopted, people have to believe in the benefit of such screenings (Hochbaum, 1958).

Perceived barriers. Behavior change is often stymied by perceived barriers. According to Janz and Becker (1984), of all the HBM constructs, perceived barriers is the most influential on behavior change. Frank, Swedmark, and Grubbs (2004) explained that the individual first assesses the barriers that are in the way of adopting a new behavior. Thus, the benefits of the new behavior must be seen as a benefit to the individual contemplating the change. The benefit must outweigh the consequences of continuing the old behavior (Frank et al., 2004). An example of a perceived barrier is trying to increase breast self-examinations (BSE) among women. The risk of breast cancer is significant enough to be a motivator to adopt early detection methods. However, some of the barriers to performing BSEs include starting a new or unfamiliar behavior, fear of doing BSE incorrectly, and embarrassment (Umeh & Rogan-Gibson, 2001).

Cues to action. In addition to the four perceptions outlined, the HBM also suggests that there are cues that influence behavior change. Rosenstock (1966) termed these cues to action These cues can include events, people, or things that are factors in the decisions to make behavioral changes (Rosenstock, 1966). Examples of these cues include illness of a family member, social media campaigns, media reports, or health warnings about products (Graham, 2002).

Motivating factors. Additionally, motivating factors can also be influential in creating behavior change. On the advice of HBM scholars, self-efficacy was added to the HBM model.

Self-efficacy is the belief that a person can complete the behavior despite potential barriers that might affect progress (Rosenstock, Stretcher & Becker, 1988). According to Bandura (1977), self-efficacy refers to a person's belief about their abilities to do something. In the context of the HBM, if a person believes that if they adopt a new health behavior and it has a benefit (perceived benefit) but they do not think they are capable of doing it (perceived barriers), then the adoption will not take place. Carpenter (2010) points out however that self-efficacy is rarely included in HBM studies.

Examining the tenets of the HBM and its perceptions can be used to understand the low rates of HIV testing behavior among seniors.

Research Questions

In this research study, there was an investigation of the attitudes, beliefs, and knowledge about HIV and risk factors for contracting the disease among seniors in the Coachella Valley, California. In addition, HIV testing behavior was evaluated to better understand factors that can predict HIV testing. Effective prevention and health promotion programs that are specific and appropriate for senior populations will aid seniors in better understanding the risks associated with the disease and provide strategies to help keep them from contracting the disease. Interpreting study results used in this research study can aid in helping healthcare professionals devise strategies on how to increase awareness and testing among seniors. At the outset of this study there were three overall themes that were highlighted through the research questions as part of this cross sectional study:

1. What are the beliefs and attitudes about HIV and HIV testing among seniors in the Coachella Valley, California?

2. Is there a statistically significant difference in HIV testing behavior between different senior age grouping?
3. Can routine health screenings be used as a predictor for HIV testing among seniors?

These themes evolved into three specific research questions that looked at beliefs, attitudes, and knowledge about HIV testing, reasons for seniors getting or not getting tested for HIV and evaluating whether routine health screenings can be used as predictors for HIV testing. The utilization of such study results can not only be used in HIV testing program development but also be used to explore new opportunities to test seniors for HIV within a healthcare setting especially if they are already seeking out such facilities for routine health screenings. For an increase in HIV testing among seniors, individual considerations like the effect of individual factors such as self-efficacy, age, and self-esteem can have an impact on the success of desired behavior change.

Summary

Current research suggests that there is a rise in HIV among people over the age of 50. Further, this age group is less likely to be tested for HIV when compared to their younger counterparts (LeComte-Hinely, 2014; HARC, 2014). Researchers suggest that there are many reasons for this behavior, but an overarching reason cited is that seniors do not perceive themselves at risk for contracting the disease. Specifically, Levy et al. (2003) reported that widowed and divorced seniors who had previously been in long term monogamous relationships did not consider themselves at risk for contracting HIV/AIDS when entering into new sexual relationships. Further, according to Loeb, Lee, Binswanger, Ellison, and Aagaard (2011), physicians are generally poor at collecting or discussing a patient's sexual history in patients over the age of 50. Reasons cited by physicians are that they assume that patients in this age

group are at low risk for contracting the disease, they are uncomfortable discussing sexual activity with patients of this age, and they avoid this discussion for fear of angering or offending older patients (Loeb et al., 2011).

The goal in this research study was to examine how knowledge about HIV and the perceived risk of HIV among seniors over the age of 50 can serve as predictors for predicting HIV testing behavior.

Chapter 2: Review of the Literature

The increase in HIV/AIDS, especially among vulnerable populations is of grave public health concern. This literature review illustrates the knowledge, attitudes, and perceived risk of HIV/AIDS among seniors 50 years and older as well as reasons that may help or hinder seniors from being tested for the disease.

Vouri and Blaszczyk (2012) purport that advances in medicine are resulting in increased longevity, which can have important implications as HIV rates are increasing in elderly populations. Vouri and Blaszczyk explained that those seniors infected with HIV are often harder to diagnose and treat, often due to the comorbidities (e.g. liver related disease, hypertension, pneumonia) and physiological effects associated with this age group. In addition, HIV/AIDS is sometimes diagnosed later in seniors than in younger patients due to symptoms often mirroring those of advanced aging. Althoff, et al., (2010) found that in a large national cohort study of HIV infected adults, the number of people over the age of 50 presenting for HIV care between 1997 and 2007 significantly increased from 17% to 27%. Further, among this age group the CD4 cell count was consistently lower for those over 50 when compared to their younger counterparts, and a greater number of older patients had diseases that are associated with AIDS or AIDS-defining diagnosis at or within 3 months before their first presentation for care compared with those younger (Althoff et al., 2010).

Late diagnosis of HIV in older adults often results in poorer prognosis. Data from 46 states that report HIV infections to the CDC showed only 14% of those under the age of 25 diagnosed with HIV during 2009 progressed to AIDS in 1 year, while the rate of progression to AIDS was much higher for those in older age groups (42% of people aged 50-54, 45% of people aged 55-59, and 49% in of people over the age of 60 (Brooks et al., 2012).

Compounding the challenge of early HIV diagnosis among the elderly population is their perceived risk of contracting HIV. According to Goodroad (2003), despite seniors engaging in behavior that can put them at risk for contracting HIV, seniors' own perception of their risk for contracting the disease is small. Due to this perception, seniors are less likely to adopt safer sexual behavior. Additionally, while sexual activity declines with age, the majority of Americans aged 57 to 65 years of age and a substantial fraction aged 66 and older remain sexually active (Lindau et al., 2007). Fisher (2010) reported, in a report from the American Association of Retired Persons (AARP), that asked 1,670 men and women about condom use. Fisher looked at homosexual and heterosexual single people over the age of 50 who engaged in sexual intercourse at least once a month during the past six months. Fisher found that only 1 in 5 of those who were sexually active said they regularly used a condom. Further, only 12% of men and 32% of women stated they used one each time (Fisher, 2010).

Therefore, seniors in this age group could potentially be exposed to and expose others to HIV/AIDS if they are not practicing safe sex (e.g., monogamy, being tested for HIV, using condoms). As people age, there are physiological changes in the body that can increase the risk for HIV infection including being diagnosed later than those younger, a more rapid progression of the disease, and shorter survival times (Goodroad, 2003).

Goodroad (2003) also suggested that there are sociological factors that can influence the risk behavior and risk reduction efforts, as well as health care and social response to the epidemic. Understanding these sociological perspectives can be useful in developing successful public health intervention strategies specific to this population.

The CDC recommends that people between the age of 13 and 64 in the United States should be tested at least once for HIV as part of a routine health care visit (CDC, 2013). However

according to Ford, Godette, Mulatu, and Gaines (2015), older adults aged 50 to 64 are less likely to receive HIV testing. Ford et al. looked at data from the 2010 Behavioral Risk Factor Surveillance System (BRFSS) survey and identified factors that are associated with HIV testing in older adults in three age groups—50 to 54 years, 55 to 59 years, and 60 to 64 years. Using multiple logistic regression, the researchers examined the prevalence of HIV testing across and within the age groups and by race and ethnicity. They found that the prevalence of HIV testing was low, at 5%, and that this rate varied by race and ethnicity as well as by age (Ford et al., 2015). Ford et al. (2015) discovered that within and across age groups, the odds of HIV testing were highest among blacks, and higher among Latinos and the oldest and youngest age categories of American Indian/Alaska Native, when compared to whites. Respondents who indicated that they had had a recent doctor's visit or HIV risk behaviors were more likely to get HIV tests (Ford et al., 2015). However, Ford et al. (2015) found that the oldest of the older adults, whites, and older women, regardless of risk, were less likely to ask for or receive HIV tests even during routine screenings or doctor's visits. The researchers concluded that more research is needed to understand why eligible older patients seen by a physician are not being screened for HIV (Ford et al., 2015). To extrapolate from Ford et al.'s (2015) conclusions, there is also the need for additional research that examines how and why HIV testing behavior differs within older age groups.

Public health campaigns and models that encourage HIV education, testing, and diagnosis help in aiding the population in knowing their serostatus and help facilitate early linkages to care for those diagnosed. Researchers like Zielinski et al., (2015) have suggested that healthcare professionals are less likely to have conversations with older patients about HIV risk factors that can contribute to the disease, less likely to encourage testing during routine health screenings,

and sometimes fail to identify signs and symptoms of HIV instead contributing the symptoms to old age or dementia. Zielinski et al. (2015) proposed that to see a reduction in HIV prevalence rates among seniors, physicians are strongly encouraged to routinely discuss risk factors associated with contracting HIV. Zielinski et al. (2015) provided the example of the state of New York, which enacted the New York State HIV Testing Law in 2010 that requires medical professionals to offer HIV testing to patients aged 13 to 64 years of age; the authors found that despite the law, the practice was not consistent. In a sample of 973 physicians across New York State, a minority of physicians "always" or "frequently" practiced behaviors consistent with routine HIV testing: 41.7% routinely offered HIV testing to patients aged 13-64 years of age, 40.5% to new patients, and 33.3% to those during routine physicals (Zielinski et al., 2015). Zielinski et al. (2015) reported that only 61.4% of respondents said they were aware of the new law. Further, when using multivariate analysis to examine physicians' practices, beliefs, attitudes, and knowledge about routine HIV testing, it was found that physicians' specialty, perceived barriers, and familiarity with the law were among some of the more significant predictors for providing routine HIV testing in a healthcare setting (Zielinski et al., 2015).

Similarly, a survey developed by HARC and GTCV was disseminated to approximately 50 doctors practicing medicine in the Coachella Valley, California, and was used to assess physician beliefs, attitudes, and behaviors when caring for patients (HARC, 2015). HARC (2015) reported the following characteristics of the survey respondents:

- The average time spent practicing medicine was 19 years.
- Forty-four of the 50 physicians surveyed were male.
- The majority of physicians saw patients who were covered by Medicare or Medi-Cal, and HIV testing was covered under the plan.

The researchers noted that insurance coverage was not seen as a barrier to receiving an HIV test (HARC, 2015). Medi-Cal is the California Medical Assistance Program or California's Medicaid Program that serves low income individuals including seniors (California Department of Healthcare Services, 2014).

Of the physician cohort surveyed in the HARC (2015) study, 49% reported seeing adults and teens in their practice and should therefore be following CDC guidelines of providing an HIV test at least once for those unaware of their serostatus. Physicians were also asked about providing HIV testing as part of a standard practice, specifically: (a) how many patients they had personally seen within the past 30 days, and (b) how many HIV tests they had personally ordered or conducted on their patients within the last 30 days (HARC, 2015). Three physicians reported seeing 600 patients within the past 30 days with 3 physicians noting that they had not seen any patients within the past 30 days, but overall the average number of patients seen within the past 30 days was approximately 235 (HARC, 2015). However, when looking at HIV tests conducted within the past 30 days, HARC (2015) reported that only 8 total HIV tests were ordered and only four physicians (9.5%) had ordered those 8 tests.

To understand what barriers might exist that caused physicians to not order HIV tests as part of a standard practice, physicians were asked "what factors, if any, reduce the number of HIV tests you order?" (HARC, 2015, p.13). Some physicians reported that at the time of the survey, their patients had already been tested for HIV and so did not need to be tested again, while others reported that they had other priorities during the visit and were unable to fit in an HIV test (HARC, 2015). HARC (2015) reported that 16 physicians checked "other" when asked about the barriers preventing them from conducting an HIV test; when asked to elaborate, physicians offered that the test was "not appropriate," "not applicable in my practice," or "not in

the scope of my practice" (p.14). HARC (2015) data revealed that some physicians believed that HIV tests were not necessary especially in the settings where they practiced; for example, some physicians felt that the "ER is not the correct setting for such testing," the test was not "necessary for trauma," or "not every patient setting is the correct setting for the discussion and follow up for HIV testing" (p.14). Several of the physicians in the study noted that some of the reasons for not testing patients included that the patients they saw were at low or extremely low risk for the disease (HARC, 2015). In another instance, the electronic health record system did not allow for the population of HIV test results (HARC, 2015).

Through the HARC (2015) survey, researchers also sought to understand the physicians' training on HIV testing as well as their attitudes and beliefs about HIV testing. The conclusion from the study results were that physicians play a pivotal role in making HIV testing a routine part of their standard practice. In addition, recommendations on training and interventions for both physicians and the public at large were suggested. Training for healthcare providers, especially about the CDC recommendations on HIV testing, could have an advantageous impact on providers' testing patients for HIV and subsequently decreasing the prevalence of the disease in seniors (HARC, 2015). To assess physician training and sentiment about HIV testing protocols, physicians were asked about their training. Results showed that 47 physicians (95%) said there was not a standard protocol for HIV testing at their training institution (where they did their residency or fellowship); only 2 physicians reported that there was such a protocol (HARC, 2015). However the HARC (2015) data did suggested that the majority of physicians believed that routine HIV testing of every teen and adult was "critically important," while about 9% had no professional opinion one way or the other about HIV testing, and 7% did not agree with the CDC recommendations or did not feel that routine HIV testing was important (HARC, 2015

p.17). This impact could be even greater for physicians who were unaware of the CDC recommendations. It can also result in increased education to the general public on the risks for contracting HIV (HARC, 2015). Finally, physicians were asked in the HARC (2015) study to provide their own perspective on increasing the rates of HIV testing. Some of the overarching themes included more education for the public, a social media campaign encouraging HIV testing, more training for providers, and reducing the stigma of the disease (HARC, 2015).

Researchers often look at the psychosocial aspects of behavior to understand; often looking to and drawing from theoretical frameworks to make inferences. The HBM theory has been used as a framework when assessing health promotion implementation specifically as it relates to individual behavior change (Glanz, Rimer, & Lewis, 2002). The HBM theory purports that a person's belief about a particular threat from a disease or illness coupled with the belief in the effectiveness of a recommended intervention, will predict the likelihood that the person will adopt the behavior (Boston University School of Public Health, 2016). Using secondary data, this research study looked at the reasons seniors in the Coachella Valley are and are not being tested for HIV, examined their perceived risk for contracting the disease and assessed a correlation between routine health screenings and predicting HIV testing. The HBM was identified and used as a theoretical framework as an explanation for the behavior that explains limited HIV testing in seniors.

Chapter 3: Research Methods

Within this chapter is an overview of the methods, research design, sample population, and the inclusion and exclusion criteria for this study. Secondary data was used to answer the stated research questions. In the first part of the study, there was an examination of the survey results about beliefs, knowledge, and attitudes about HIV and HIV testing among seniors 50 years of age or older. In the second part of the study, the reasons why seniors are or are not being tested for the disease and whether there is a relationship between routine health screenings and the likelihood that seniors would be tested for HIV was explored. Study findings were used to understand where there might be missed opportunities for HIV testing among this vulnerable population. In addition to the study results, a theoretical framework was used to provide context and further explanation of behavior specifically about lack of self-protective behavior. The HBM model was originally used to illustrate lack of tuberculosis health screening participation in the 1950s (Rosenstock, Stretcher, & Becker, 1994). It was also used as a resulting theory to explain health behavior as well as reasons for lack of participation in health screenings (Becker & Rosenstock, 1984). In this methods section, the research strategies, design, data collection, population sample, research questions, hypothesis and analysis will be described.

Research Strategies

In social science research, there are two research strategies: the quantitative and qualitative approaches. The quantitative approach as defined by Creswell (1994) is "an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analyzed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true" (p.42). Quantitative research requires concepts, variables, and hypotheses to be developed prior to the start of the project and continually be

referenced throughout the project (Creswell, 1994). According to Creswell, a qualitative study is "an inquiry process of understanding a social or human problem from multiple perspectives (p.42). Qualitative research seeks real-life experiences, meaning, rich description, and a comprehensive worldview (Creswell, 1994). In this research study, secondary data was utilized in both quantitative and qualitative approaches to understand HIV testing behavior among seniors in the Coachella Valley, California.

Research Design

A cross sectional design was used to assess perceived risk among seniors for contracting HIV and HIV testing behavior. Specifically, for this research, this design allowed for the identification of any patterns in relationships that existed in the data while not assigning causation. The variables and related data was analyzed using frequency analysis and logistic regression.

Secondary data from a community survey developed and administered by HARC (2014) for the GTCV Campaign illustrated the attitudes, knowledge, and behavior of Coachella Valley residents to HIV testing and the reasons people are tested for HIV. GTCV is a region-wide public health campaign dedicated to dramatically reducing HIV by making voluntary HIV testing a part of standard and routine medical practice. A partnership between HARC and GTCV was formed in 2013 to evaluate the components of the campaign (HARC, 2014). In addition, the campaign also ensures linkages to care for those who test positive for HIV/AIDS (HARC, 2014).

The survey instrument used by HARC was patterned after the CDC's Behavioral Risk Factor Surveillance System (BRFSS) survey. In the HARC (2014) study, a non-randomized, non-probability sample was used.

Data Collection

The secondary data used in this study was collected from the GTCV Community Survey developed by GTCV and HARC (HARC, 2014). The survey instrument used was patterned after the CDC's Behavioral Risk Factor Surveillance System (BRFSS) survey (HARC, 2014). The timeframe for data collection ran from June 2014 to August 2014 with recruitment beginning on June 25, 2014. Survey results were collected in person and online with in person data collection concluding on August 19, 2014, and online data collection ending on August 21, 2014. In person data that was collected was entered into an online database and then merged with the online data collected. Based on the original study, a total of 33.9% of the respondents took the survey online, while 66.1% of respondents participated in the paper survey. The survey was provided in both English and in Spanish (see Appendix A and Appendix B). Survey links were posted in various forms to social media including to the Desert Sun's LGBT blog, and HARC's Facebook page and Twitter accounts. In person data collection was also utilized with on-site recruiters providing respondents with hard copy surveys throughout the Coachella Valley, California (HARC, 2014). Hard copy data collection was deemed vital to capture those respondents who were less likely to complete an online survey, especially those from low income and elderly populations (HARC, 2014). The in-person data collection sites included senior and community centers, libraries, laundromats, food distribution sites, and healthcare clinics, and there were also bilingual data collectors at each site. Participants were invited to take the survey with them and either return completed surveys to data collectors onsite or return them via prepaid return envelopes (HARC, 2014).

After the data was cleaned, there were 995 valid survey respondents with ages ranging from 12 to 93 which an average age of 49. This compared with the median age used for this study, which was 53 years of age (LeComte-Hinely, 2014). For this study, secondary data extracted was specific to individuals who were over the age of 50 and who reported residing in the Coachella Valley. Under those stipulations, the sample for this current study included 479 seniors over the age of 50 and was a representative sample of seniors residing in the Coachella Valley as highlighted in a 2013 Community Health Monitor report which is an in depth report about the state of health and well-being of residents in the Coachella Valley (HARC, 2013). Data was analyzed by using SPSS. The survey tool was used to assess attitudes, knowledge, and behavior among Coachella Valley residents regarding HIV testing. The original purpose of HARC's (2014) study was to inform GTCV about the reasons why residents were and were not being tested to help inform and understand the barriers around testing and to improve opportunities for testing.

Population Sample

Representative samples came from the nine cities within the Coachella Valley as well as some unincorporated areas (HARC, 2014). According to HARC (2014), the survey locations included: Bermuda Dunes, Cathedral City, Coachella, Desert Hot Springs, Desert Shores, Indian Wells; Indio, LaQuinta, Mecca, North Shore, Palm Desert, Palm Springs, Rancho Mirage, Salton Sea, Sky Valley, Thermal, and Thousand Palms. The inclusion criteria for this dissertation study included residents living in the aforementioned nine cities of the Coachella Valley and unincorporated cities listed. Participants were included if they were over the age of 50. To assess age, participants were asked for their age as part of the community survey. The exclusion criteria included removing any data from participants who indicated living outside of Coachella Valley

or those who did not indicate a city of residence when asked what city they lived in as part of the community survey (HARC, 2014).

For the purpose of this research study, the terms "elderly" and "seniors" were used interchangeably and were identified as anyone over the age of 50.

Research Questions and Hypotheses

The research questions (RQs) for this study are as follows:

RQ 1. How do seniors perceive their risk of contracting HIV? What are the reasons seniors are or are *not* being tested for HIV?

RQ 2. Is there a significant difference between age groups (50s, 60s, 70s, and 80+) in the likelihood of getting tested for HIV in the Coachella Valley, California?

RQ 3. Is there a relationship between obtaining routine health screenings (i.e., cholesterol, high blood pressure, diabetes) and HIV testing among seniors in the Coachella Valley, California?

Data Analysis

The variables for this study were primarily categorical. Specifically, for each research question, the independent variables (IVs) and dependent variables (DVs) are identified below:

RQ1. The IV was age, while the dependent variables DVs were groups at risk (50, 60, 70, 80+ years of age) and reasons (why or why not) for getting tested. Frequency analyses were conducted to examine the reasons for seniors getting or not getting tested for HIV test.

RQ2. The IV was age groups (50s, 60s, 70s, and 80+) and the DV was HIV testing (being tested or not being tested for the disease). A logistic regression was conducted to examine HIV testing behavior differences between age groups.

RQ3. The IV was routine health screenings (having routine health screenings or not) and the DV was HIV testing (getting tested or not getting tested for the disease). A logistic regression was conducted to assess the likelihood of getting an HIV test using routine health screenings as predictors. The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. Frequencies and descriptive statistics were run to analyze demographic data. Factor analysis and correlations were then conducted to explore the research questions.

Summary

This research study was a cross sectional study using multiple analytic methods to examine the aforementioned research questions. Frequency analyses were conducted to examine the reasons for seniors getting or not getting tested for HIV. Second a logistical regression was conducted to examine HIV testing behavior between groups. Third a logistic regression was used to examine the likelihood of getting an HIV test using routine health screenings like cholesterol, blood pressure, and diabetes as predictors.

Chapter 4: Results

This chapter presents findings and data analysis of this research study that revealed HIV testing behavior of seniors in the Coachella Valley, California. Respondent demographics, testing behavior, reasons for HIV testing in seniors, and the possible correlation between routine health screenings and HIV testing are reported.

At the beginning of this current research study, it commenced with broad aims which were solidified into specific research questions and objectives. These questions would aid in understanding the beliefs and attitudes about HIV and how these beliefs might give insight into HIV testing behavior specifically among seniors in the Coachella Valley, California. Additionally, in examining the study results, it was anticipated that additional insights might be uncovered e.g. whether HIV testing behavior decreases with age and whether seniors are provided the opportunity for HIV testing when they visit their doctors for routine health screenings like cholesterol, blood pressure, and diabetes. As mentioned previously, the broad themes about HIV testing behavior resulted in the refinement of three research questions and hypotheses that were tested in this study. The three research questions asked:

1. How do seniors perceive their risk of contracting HIV? What are the reasons seniors are or are not being tested for HIV?
2. Is there a significant difference between age groups (50s, 60s, 70s, and 80+) in the likelihood of getting tested for HIV among seniors in the Coachella Valley?
3. Is there a relationship between obtaining routine health screenings (i.e., cholesterol, high blood pressure, diabetes) and HIV testing among seniors in the Coachella Valley?

This study used multiple analytic methods to examine the previously stated research questions.

First, frequency analyses were conducted to examine the reasons for seniors getting or not getting tested for HIV. Second, a logistic regression was conducted to examine HIV between age groups. Finally, a logistic regression was used to examine if there was a relationship between seniors obtaining a routine health screening and the likelihood that they would obtain an HIV test.

Participant Demographics

Participants were asked to provide demographic information such as age, gender, race and ethnicity with the demographics being collected and analyzed.

Age

Participants in this study ranged from 50 to 93 years of age. The mean age of participants was 62.6 years old. Table 1 represents the age distribution of study respondents. Table 2 represents the gender distribution of the study sample.

Table 1 provides a graphical representation of age of respondents in decades.

Table 1

Respondent Age in Decades

Age	*n*	%
50s (50 to 59)	208	43.4
60s (60 to 69)	165	34.4
70s (70 to 79)	71	14.8
80s and older (80 +)	35	7.3
Total	479	100

Gender. Table 2 shows the gender distribution for this sample

Table 2

Gender Distribution of Respondents

Gender	*n*	%
Male	196	41
Female	282	59
Total	478	100

Note. One participant did not report gender, so the total is 1 less than the study total ($N = 479$).

Race and ethnicity.

The data illustrated that a majority 59.9% ($n = 287$) of the survey respondents identified themselves as "Not Hispanic/Latino," while 37.4% ($n = 179$) identified themselves as Hispanic/Latino. Tables 3 and 4 illustrate a breakdown of the respondents by race and ethnicity. The demographic information presented is assumed to be a representative sample of the population in the Coachella Valley. Of special interest is that 18.2% of respondents identified themselves as "other" on the community assessment survey. According to HARC (2014), many respondents found it difficult to distinguish race from ethnicity. This conclusion is supported by viewing the open-ended responses that were tied to the "Other" option, as displayed in Table 4. Some examples of common responses were "Mexican," "Hispanic," "Latino," and "Chicano" among other self-identification characterizations.

Table 3
Reported Race of Respondents

Race	*n*	%
White/Caucasian	337	70.4
Black/African American	12	2.5
Asian/Pacific Islander	4	0.8
American Indian/Alaska Native	4	0.8
Other	87	18.2
Missing	13	2.7
Total		

Table 4
Clarification of Race by Respondents When Other Was Marked

Participant Responses	*n*	%
American Indian/Hispanic	1	0.2
American of Mexican descent	2	0.4
Americana	1	0.2
East Indian/Hispanic	1	0.2
Hispanic	3	0.6
Hispanic/Latino	1	0.2
Hispano	6	1.3
Latina	1	0.2
Latina/Mexican	1	0.2
Latino	2	0.4
Latinos	1	0.2
Mexicana	1	0.2
Mexican	7	1.5
Mexican American	5	1
Mexicana	4	0.8
Mexicanos	1	0.2
Mixed race	1	0.2
Puerto Rican	1	0.2
Sri Lankan	1	0.2
Sudamerica	1	0.2
White/Jewish	1	0.2
Total	43	100

Research Question 1

How do seniors in Coachella Valley perceive their risk of contracting HIV? What are the reasons that seniors are or are *not* getting tested for HIV? RQ 1 sought to understand why seniors in the Coachella Valley were or were not being tested for HIV. Respondents who indicated on the survey that they had been tested for HIV were then asked "Why did you choose to get tested for HIV?" Participants were encouraged to check all that applied. For this research question frequency analyses were conducted to examine why or why not seniors were being tested for HIV. Table 5 indicates that the most common reason for HIV testing was "Experts recommend everyone get tested, so I did" (n = 55) followed closely by "Concerned I might have been exposed to HIV" (n = 53). Other top responses included testing was "free at an event" (n = 44) and "provider offered" (n = 43). Quite a few participants (n = 37) answered "Other" when asked about the reasons for their decision to have an HIV test. The responses to the open-ended question for those that selected "other" included:

- Before getting married
- Part of regular healthcare regimen
- It was routine prior to surgery
- Got sick and doctor recommended testing

Table 5

Reasons for Getting Tested

Reason	***Frequency***
Experts recommend everyone get tested, so I did	55
Concerned I might have been exposed to HIV	53
Free at an event	44
Provider offered	43
Friends or family recommended it	20
Required by employer	16
Partner is HIV positive	11
Other-Before getting married	6
Other-Part of regular healthcare regimen	4
Other-Got sick and doctor recommended testing	3
Other-It was routine prior to surgery	3
Other-Blood donation	2
Other-Immigration	2
Other-Jail/prison	2
Other-I was worried about my health	2
Other-Got tested before a new relationship	1
Other-College	1
Other-CVRM	1
Other-Hospital analysis	1
Other-I worked in health care when exposure was possible, so our office was tested	1
Other-I've worked with HIV/AIDS folks, so thought it was a good idea	1
Other-I'm part of a 30-year old research project through UCLA and get tested twice annually	1
Other-Mandatory	1
Other-My choice	1

Other-My partner has herpes	1
Other-My partner in the 80's died of AIDS	1
Other-Had new sexual partners	1
Other-I wasn't sure of my husband's loyalty	1
TOTAL	**279**

Participants who indicated on the survey that they had not been tested for HIV were asked "Why haven't you been tested for HIV?" Participants were encouraged to check all that applied with the "Other" category including a space to enter their own reasons for why they were not tested for HIV. Table 6 includes the overarching reasons that seniors used for not being tested for HIV including "I don't think I'm at risk" (*n*=151); with "I'm not sexually active" (*n*=65) ranking the second highest among respondents closely followed by "My doctor/healthcare provider never offered to test me" (*n*=64). Study results illustrated seniors' attitudes and beliefs about their perceived risks for contracting HIV and their attitudes about HIV testing. The number of participants who checked "Other" for why they had not been tested was a much smaller sample than those who checked "Other" for why they had been tested. The most common reason for checking "Other" for those who had not been tested was "I am in a monogamous relationship." ($n = 4$).

For the survey questions on why or why not seniors were tested for HIV, study respondents were encouraged to provide all answers that apply resulting in $N > 479$.

Table 6

Reasons for Not Getting Tested

Reason	***Frequency***
I don't think I'm at risk	151
I'm not sexually active	65
My doctor/healthcare provider has never offered to test	64
I don't know where to get tested	19
I can't afford to get tested	10
I don't want anyone to judge me	9
I don't have transportation to a testing site	9
I'm too embarrassed	7
I don't want to know if I have HIV	7
I don't have insurance	5
Other-I'm in a monogamous relationship	4
Other-I donate blood	1
Other-Didn't know everyone could get tested	1
Other-Do not want to take the HIV test	1
Other-God is my healer and I don't have HIV	1
Other-Never felt the need	1
Other-None of your business	1
Other-Not sure	1
Other-No excuse	1
Total	**358**

Research Question 2 and Hypothesis

Is there a significant difference between age groups (50s, 60s, 70s, and 80+) in the likelihood of getting tested for HIV in the Coachella Valley, California? The following hypothesis was developed to answer this question:

H_0: There is no significant difference in age groups in HIV testing behavior among seniors in the Coachella Valley.

H_1: There is a significant difference between age groups in HIV testing behavior among seniors in the Coachella Valley.

A logistic regression was conducted to examine HIV testing behavior differences between age groups (50s, 60s, 70s, and 80+). For the purposes of this study, four age ranges were used as comparisons. Study results showed that there was a significant difference between age groups and the likelihood of getting a HIV test. Post hoc analyses were conducted to determine which cell or cells caused the statistically significant difference. (Table 7) suggests that indeed there is a significant difference between age groups in the likelihood of getting an HIV test ($\chi[3] = 39.5$, $p < .001$).

Table 7

Comparison of Age Groups in Rate of HIV Testing

		Have you EVER been tested for HIV?	
Age		Yes	No
50s			
	Count	116	83
	Expected	96.4	102.6
	Std. Residual	2	-1.9
60s			
	Count	83	76
	Expected	77	82
	Std. Residual	0.7	-0.7
70s			
	Count	19	48
	Expected	32.5	34.5
	Std. Residual	-2.4	2.3
80+			
	Count	2	27
	Expected	14.1	14.9
	Std. Residual	-3.2	3.1
Total		220	234

In order to conduct the post hoc analyses to determine which cell or cells resulted in a statistically significant difference, the residuals (or difference) between the observed and expected frequencies were converted to *z*-scores. The standardized residuals were then compared to the critical value for an alpha of 0.05 (+/- 1.96). Specifically, the residuals for each of the specific cells were examined to determine if the actual frequency significantly varied from the expected frequency. Results suggest the standardized residual was greater than the critical value for people in their 50s (2.0) and was lower than the critical value for people in their 70s (-2.4) and for those over 80s (-3.2). This result suggests that among those who were tested for HIV, there were more people tested in their 50s than would be expected, while there were

fewer people tested in their 70s and in their 80s (and beyond) than would be expected. In other words, seniors in their 50s (n = 116) were more likely to be tested for HIV when compared to seniors in their 60s (n = 83), 70s (n = 19), and 80+ (n = 2). Figure 1 illustrates the age groupings and number of seniors who were tested for HIV.

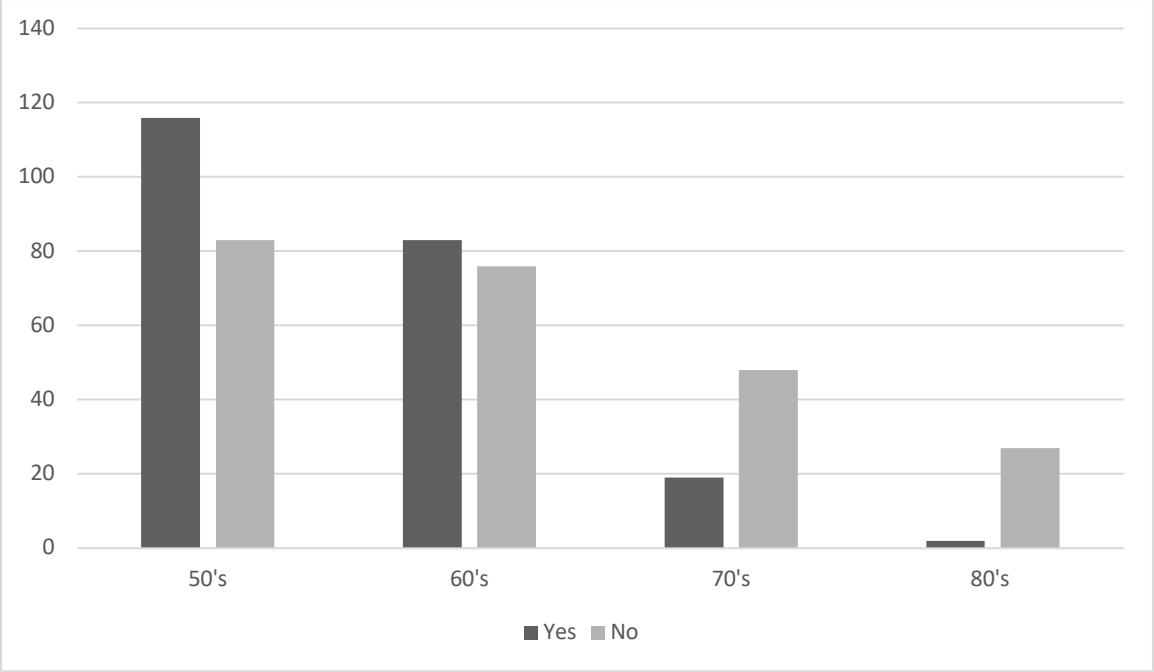

Figure 1. Bar chart of age groups and number of people tested for HIV.

Research Question 3 and Hypothesis

Is there a relationship between obtaining routine health screenings (i.e., cholesterol, high blood pressure, or diabetes) and HIV testing among the seniors in the Coachella Valley? The following hypothesis was developed to answer this question:

H_0: There is no relationship between routine health screenings and HIV testing among the elderly in the Coachella Valley.

H_1: There is a relationship between routine health screenings and HIV testing among the elderly in the Coachella Valley.

A logistic regression was conducted to examine the likelihood of getting tested for HIV using routine health screenings (cholesterol, blood pressure, and diabetes) as predictors. Results of the full model using logistic regression were statistically significant indicating that the group of predictors reliably predicted those who get tested for HIV and those who do not ($\chi[3] = 8.64$, $p = .03$). Nagelkerke's R squared of 2.6% between the predictor variables (routine health screenings) and the outcome variables (obtaining a HIV test) is significant. However, the Wald criterion demonstrated that none of the predictors made a unique contribution alone to the model (cholesterol screening, blood pressure screening, and diabetes screening, all $p > .05$).

Thus, while the overall model is statistically significant, the results suggest that the three routine screenings are not collectively useful in predicting the likelihood of obtaining an HIV test. One possible explanation for the poor model fit is the presence of multicollinearity. Multicollinearity occurs when the predictor variables are correlated with one another. If the factors are redundant, then they are not uniquely contributing to the outcome variable. As demonstrated in Table 8, there is a strong correlation between diabetes screening and cholesterol and blood pressure screening. There is also a strong correlation between cholesterol and blood pressure screening. Thus, multicollinearity among the predictor variables (cholesterol, blood pressure, and diabetes screening) is likely minimizing the ability to predict the likelihood of the outcome variable (obtaining HIV testing).

Table 8

Correlation Between Routine Screenings and HIV Testing

	Cholesterol Screening	Blood pressure screening	Diabetes Screening
Tested for HIV			
Correlation	.108*	.135**	.086
Sig.	.024	.004	.072
N	443	443	439
Cholesterol Screening			
Correlation	1	.756**	.586**
Sig.		.000	.000
N		460	458
Blood pressure screening			
Correlation		1	.627**
Sig.			.000
N			458

**$p < .01$ (2-tailed).

*$p < .05$ (2-tailed).

While these results do not show a statistical significance between routine health screenings and HIV testing, it does underscore the importance of using a single point in time (when receiving routine health screenings) as an opportunity to conduct routine HIV testing at least once among seniors. Due to advancing age, seniors are more likely to access healthcare services specifically for routine health screenings both inside and outside of health care settings. This combination could allow for coupling HIV testing and education as a part of a more comprehensive health screening.

Summary

In this chapter, data was analyzed and interpreted. The purpose of the study was to examine HIV testing behavior the among seniors in the Coachella Valley, California. Specifically,

multivariate logistic regression was used to examine how seniors perceive their risk for contracting HIV as well as their beliefs, knowledge, and attitudes of HIV and HIV testing. This data helped illustrate the reasons why seniors are or are not being tested for HIV. In addition, further analysis was used to assess whether there is an association between age and testing behavior and whether age can be used as a significant predictor of testing behavior. To illustrate where there may be points of contact to test seniors for HIV, the relationship between routine health screenings and HIV testing was also explored. Study findings can be used to identify where there are missed opportunities for HIV testing among this vulnerable population and to recommend the development of strategies and programming to encourage testing.

Study results indicated that there were a greater number of study participants that were white and female with the majority of respondents being between 50 to 59 years of age. Results of the data analysis suggest that when assessing attitudes and knowledge about HIV, the majority (n = 55) of those who had been tested for HIV cited that "experts recommended everyone get tested so I did." This response is in line with the CDC recommendation that those between the ages of 13 and 64 should be tested for HIV at least once as part of routine health care (CDC, 2013). Conversely, for seniors who had not been tested for HIV, the overarching reasons given were "I don't think I'm at risk" , "I'm not sexually active" , and "my doctor/healthcare provider has never offered to test me" . Based on their attitudes, beliefs, and risk perception, it is clear that additional resources are needed to educate this vulnerable population about the ways of and risks for contracting HIV. An important distinction is that based on the study, participants aged 50 and 59 were more likely to have been tested for HIV compared to other age groups in their 60s, 70s, and 80 and older.

Chapter 5: Discussion

The increase in the prevalence in HIV among seniors in the United States is of grave concern. The rise of the disease in this demographic can be attributed to many factors, including lack of testing, perceived risk for contracting the disease, difficulty in diagnosis among this age group, and physician willingness to discuss and test this age group for HIV (Vouri & Blaszczyk, 2012). It should also be noted that with the development of more effective HIV drug therapies, seniors are subsequently living longer with the disease, although they can be affected by the side effects of treatment when compared to their younger counterparts living with the disease (Vouri & Blaszczyk, 2012) It is estimated that half of Americans living with HIV will be over the age of 50 in the near future (Brooks, Buchacz, Gebo & Mermin, 2012). Further, the CDC reported (2015a) that the number of seniors living with HIV is expected to increase. It is therefore imperative that based on accurate and recent data, effective strategies need to be developed to address and mitigate the low rates of HIV testing among seniors.

Interpretation of Findings

In this chapter, the results outlined in Chapter 4 will be discussed. It will provide an explanation of findings and highlight implications for the results of the study. Limitations of the study and future research opportunities will also be discussed. In this research study, HIV testing behaviors was examined among seniors in the Coachella Valley, California; specifically, seeking understanding as to why or why not seniors are being tested for HIV. Additionally, the study sought to understand what factors hamper or help seniors get tested for HIV and the level of perceive risk seniors believe they have for contracting the disease. The Health Belief Model was used as a theoretical framework to provide understanding on why seniors might not engage in self protecting behavior.

In this study, secondary data from HARC's (2014) Community Survey was used to examine the HIV testing behavior of 479 seniors over the age of 50 in the Coachella Valley. The following research questions were addressed:

1. How do seniors perceive their risk of contracting HIV? What are the reasons seniors are or are not being tested for HIV?
2. Is there a significant difference between age groups (50s, 60s; 70s, and 80+) in the likelihood of getting tested for HIV in the Coachella Valley, California?
3. Is there a relationship between obtaining routine health screenings (i.e., cholesterol, high blood pressure or diabetes) and HIV testing among seniors in the Coachella Valley, California?

While 479 seniors completed the survey, more women 282 (58.9%) completed the survey compared to men 196 (40.9%). Overall in the Coachella Valley, the sample population differences in gender of seniors varies with little difference to the overall population HARC, 2014).

Based on the survey results, the majority of seniors were predominantly white, followed by Hispanics, and then blacks making up the respondent pool. While this is representative of the population of the Coachella Valley, it cannot be generalized to the general population. When looking at race and ethnicity, the study results showed that the overwhelming number of respondents were Caucasian (n = 337) while those who identified as Black were a very small percentage of the total (n = 12). Some respondents seemed unable or unwilling to distinguish between race and ethnicity. This conclusion is supported by viewing the open-ended responses (18.2%) that were tied to the "Other" option when asked about race and ethnicity.

Health behavior was also examined as part of this research with an aim of understanding why seniors are or are not being tested for HIV. In 2006, the CDC revised its' recommended guidelines to encourage health care providers to test patients aged 13-64 years of age at least once for HIV as part of a routine physical examination (CDC, 2006). The GTCV campaign committed over a 3-year period to dramatically reducing HIV prevalence, making HIV testing a routine part of medical practice and linking those who test positive to care (HARC, 2014). During the first 18 months of the campaign, GTCV's Early Intervention Specialists linked 89.9% of newly-diagnosed HIV positive patients to treatment and care (HARC, 2014). This 89% rate exceeded both the average percentage of HIV positive patients linked to care in the State of California, which is 52%, and the national average of 66%.

The current study survey results illustrated that there are various reasons that seniors are being tested for HIV, including expert recommendations and concerns about being exposed to the disease. Similarly, there were various reasons why seniors were not being tested for HIV, including not thinking they were at risk, not being sexually active, and their providers not offering to test. Of note, for seniors who had not been tested for HIV, there was a wide variance in the reasons they were not tested. Overwhelmingly, seniors indicated that they did not think they were at risk for contracting the disease. Specifically, of the seniors who answered they were not being tested, the majority either thought that they were not at risk, were not sexually active or were not offered a test by their healthcare provider.

The clear picture that emerges from the research findings is that the perception of risk among sexual active seniors can have an effect on whether seniors feel the need to be tested for HIV even when engaging in at risk sexual behavior. Study results indicate that education on the risks of HIV and the benefits of HIV testing is especially needed among seniors in their 60's and older

since study results show that seniors in their 50's are doing a much better job of getting tested. While seniors are perceived to be less likely to be sexually active compared with younger people, the risks associated with sexually transmitted diseases (STDs) are a real concern. In 2014, HARC reported that about half of Coachella Valley seniors (53%) were sexually active within the past year (LeComte-Hinely & Segovia, 2014). The report also detailed that sexually active seniors in the Coachella Valley were less likely to use condoms when compared to their younger counterparts. Specifically, only 11.6 % of those surveyed used a condom to protect against STDs including HIV (LeComte-Hinely & Segovia, 2014). This result underscores the complexity of the issue of seniors' perceived risk for contracting HIV and can explain the lack of self-protective behavior such as using condoms or being tested.

Discussion of Research Findings

Survey results suggested that there are various reasons why seniors in the Coachella Valley are and are not being tested for HIV. Based on the data about perceived risk, the first research question examined why seniors are or are not being tested for HIV and provided insight on seniors' perceived risk for contracting HIV. Seniors who were tested for HIV reported that their primary reasons for being testing included recommendations from experts, concerns about being exposed to HIV, and testing was offered free at an event.

However, seniors who had not been tested for HIV indicated that they had not been tested primarily because they did not think they were at risk, were not sexually active, or their doctor or healthcare provider did not offer to test them. The HBM model suggests that a person must perceive a risk to themselves in order for behavior change to be successful (Hochbaum,1958).

Additional data and studies confirm some of the reasons seniors are tested for HIV. For instance, a study by the National Institute on Aging (National Institute on Aging [NIA], 2016) suggests some overall reasons that older Americans may not be tested for HIV include:

- Seniors are often less knowledgeable about the HIV disease and how it is spread, the importance of using condoms, not sharing needles, getting tested for HIV and consulting with their healthcare providers about HIV.
- Healthcare workers and providers are less likely to talk to seniors about HIV testing and prevention.
- Seniors often do not talk to their health care providers about their sexual habits or risk behaviors.
- Healthcare providers may not ask their elderly patients about their sexual activity or discuss sexual risk behavior as part of a routine check-up.

The reasons outlined by the NIA on why seniors might not be tested for HIV are consistent with seniors' responses from the GTCV Community survey for those who had *not been tested* for HIV.

The HBM states that there are three factors that are predictors of behavior change. They include: (a) the individual must have a perceived risk, and the greater the perceived risk, the increased likelihood that it will result in the mitigation of the risk; (b) there must be a belief that a behavior change will result in a positive outcome, and the perceived benefit must be seen as greater than that of contracting the disease; and (c) there must be a sense that a person must be able to competently make the behavior change and have the knowledge to carry it out (Rosenstock et al., 1988). With the increased knowledge about how HIV is contracted, the co-

morbidity from the disease, treatment options, and outcomes without treatment, individuals will still need to determine what the likelihood is for them to contract the disease.

This research study also revealed that seniors were not being tested for HIV because "my doctor/healthcare provider has never offered to test me." This particular response presents a juxtaposition between those who were tested for HIV and those who were not. For those tested, "experts recommended everyone get tested, so I did" is an ironic statement given that for those who were not tested, they stated that "my doctor/healthcare provider has never offered to test me." It is clear that healthcare professionals are a key catalyst for encouraging and ensuring that seniors are provided with the most accurate information about HIV prevention and the dangers of risky sexual behavior. In addition, offering to test seniors who have never had a HIV test should be a part of a routine health screening as identified as best practice by the CDC. A common misconception that seniors are not sexually active can be attributed to the likelihood that seniors may not be offered an HIV test. Doctors play a pivotal role in discussing safe sexual practices including encouraging condom use among this demographic.

The importance of testing and medical professional having a discussion with seniors about testing is necessary since seniors often do not see themselves at risk for sexually transmitted diseases including HIV.

The lower numbers of condom use among seniors compared to other groups is often due to seniors rationalizing that they do not need condom protection against pregnancy or due to age or being in a committed relationship (Belcher et al., 2005). In the GTCV community survey conducted by HARC (2015), seniors were not asked specifically if they used condoms. However, nationally the decreased use of condoms among seniors is a cause for concern. While studies have shown that the use of condoms as a self-protecting behavior can effectively reduce the

spread of HIV, the perceived benefit as outlined in the HBM requires the individual to believe that by taking a certain action that it will help to prevent the problem from occurring (Rosenstock et al., 1994). If seniors believe that condoms can prevent the spread of HIV and that they are at risk, the likelihood exists that they will use condoms to protect against contracting HIV. That assumption would likely extend to those seniors in this study who had not been tested for HIV. It is therefore of the utmost importance that seniors understand their risks for contracting HIV especially if they are engaging in sexual behavior and not using condoms. This realization can have positive effects on seniors engage in self-protective behavior.

An important aspect of the research study and extracted from the secondary data was differences in HIV testing behavior *between* ages. The hypothesis that was tested sought to determine whether there was a *significant* difference between age groups and HIV testing behavior. This provides the ability to understand whether HIV testing behavior increased or decreased with age. The results about the specific age grouping testing behavior will provide insights in developing meaningful strategies to increase testing at later ages.

A logistic regression was conducted to examine HIV testing behavior differences between age groups and to determine whether there was a significant difference in HIV testing among the age groupings. For the purposes of this study, the specific age groups tested were seniors in their 50s, 60s, 70s and 80+. The results of the logistic regression did indeed show that there was a significant difference between age groups and the likelihood of getting a HIV testing. The trend around HIV testing behavior suggests that the older people are, less likely they are to be tested for HIV (Nguyen & Holodniy, (2008). A HARC 2014 report that included 1,935 respondents in the Coachella Valley found that while there were no significant differences between race, ethnicity, income, education, or gender and HIV testing behavior. However, there were

significant differences when age was a factor. Adults aged 25 to 34 years of age and those aged 35 to 44 years of age were more likely to be tested for HIV (only 38.5% and 26.8%, respectively, had not been tested for HIV). After the age of 45, there was a significantly higher number of people not being tested for HIV: 40.9% in the 45-54 age range; 55.1% for those aged 55-64 years old; 72.4% for those aged 65-74 years old; and 84.4% for those over the age of 75 (HARC, 2014). This is consistent with other research that indicates that age is a predictive factor in HIV testing behavior. While there are now medical advances that allow those living with HIV to live longer, complications of heart disease, cancer, dementia, and kidney disease which are sometimes termed as diseases of aging, can complicate the management of the disease.

The third research question explored whether there was a relationship between routine health screenings like cholesterol, high blood pressure, or diabetes screenings and HIV testing among seniors in the Coachella Valley. HARC (2015) found that seniors are more likely to seek routine health screenings like diabetes, cholesterol, and blood pressure than their younger peers. It was found that younger people aged 18 to 24 years old (64.1%) had never had a cholesterol screening while for those between the age of 65 and 74 years of age, only 3.9% had never been tested for cholesterol (HARC, 2013). Determining whether HIV tests are also being conducted along with routine health screenings, can illustrate the predictive value for the likelihood of HIV testing during this time and opportunities counseling on HIV testing if they are not.

A logistic regression was conducted to determine the likelihood of being tested for HIV using routine health screenings (cholesterol, blood pressure, or diabetes) as predictors. The Nagelkerke's squared of 2.6% between the predictor variables (routine health screenings) and the outcome variable (obtaining a HIV test) is significant. However, on further testing using the

Wald criterion demonstrated that none of the predictors made a unique contribution alone to the model (cholesterol screening, blood pressure screening, and diabetes screening, all $p > .05$).

While no correlation was found between routine health screenings and the likelihood of getting a HIV test, routine health screening visits provide an opportunity for healthcare professionals to discuss and conduct HIV tests. Routine HIV testing allows for healthcare providers to discuss the importance of knowing one's HIV status, as well as ensuring that those newly diagnosed with HIV are linked to treatment, counseling, and support services (Loeb et al., 2011). Best practices in HIV testing should include informing the patient about the proposed test; giving specific information about the specific test to be performed; providing voluntary counseling and treatment options, offering additional testing if needed; and informing the patients about their rights to decline the test (Loeb et al., 2011).

Opportunities for Future Research

This research study can add to the current limited body of research on seniors and HIV testing behavior. While this research study provided some understanding and explanation of how perceived risk can influence HIV testing behavior among seniors in the Coachella Valley, future research can provide additional insights nationally. The study results indicated that "healthcare professionals not offering to test" was a key reason for why seniors were not being tested and is seen as a barrier to testing. Responses like this, provide insight into the importance of healthcare professionals offering a routine HIV test at least once to seniors as part of their overall healthcare management. Further exploration to understand the reasons for lack of consistent counseling by healthcare providers on the importance of HIV testing among seniors can initiate the development of policy and training protocols to improve HIV testing in this vulnerable population. The issue of physician initiated HIV testing among seniors in the

Coachella Valley was outside the scope of this study but is invariably an important part of ensuring that seniors, especially those at increased risk for the disease, are tested.

Seniors have more routine health screenings than their younger counterparts. Further research can pinpoint how these opportune encounters with the healthcare system can lead to increases in HIV testing among seniors. These health screenings, which include cholesterol, diabetes, and blood pressure can be utilized to determine whether under the right conditions, increased HIV test screenings can be achieved. In addition, these opportunities can be used to engage, educate, and encourage seniors to be tested for HIV. Study findings can also be used to develop training modules that provide physicians the tools necessary for conversations with elderly patients on the importance of knowing their HIV status.

It is important to note that risk factors that put seniors in danger of contracting HIV are also the risk factors that can put them at risk for contracting other sexually transmitted diseases. Research that assesses a senior's perceived risk of contracting an STD compared to contracting HIV, will allow researchers to see if the perceived risk is similar or different.

Finally, interviewing *couples* on their HIV testing habits might garner additional insight into the motivations for self-protective behavior and HIV testing. Exploring whether both or one party determines whether they receive an HIV test can aid in strategies to increase testing or at the very least understand why or why not seniors are being tested.

Implications

This research study adds to the current literature about HIV testing behavior among seniors. It contributes to the current understanding about the reasons for the lack of HIV testing among seniors and provides an opportunity for further research as well as the development of policies and procedures to improve testing among this group. This study suggests that education,

particularly from physicians, can be used to change the notions that seniors are not at risk for contracting HIV. This education is fundamental to increasing HIV testing behavior. Best practices that involve HIV testing in all healthcare settings as outlined by the CDC should be a part of local level policy. This research study also has several implications for not just strengthening future research but also offering insight into elements of predictive HIV testing behavior in seniors over the age of 50.

While this study did not specifically focus on the exact risk factors that can lead to risky sexual behavior that puts seniors at greater risk for contracting HIV, factors like excessive use of alcohol and drugs should not be overlooked. With increased attention being paid to opioid misuse and abuse, highlighting this abuse as a growing risk factor for risky behavior should be considered. Hayes et. al (2002) noted that alcohol and substance abuse among seniors in the United States is now a hidden epidemic. The office of Substance Abuse and Mental Health Services Administration (SAMHSA) stated that it is estimated that 10% of the population abuses alcohol, but in the over 65 years old population, this percentage can rise as high as 17% (SAMHSA, 2014). As risky sexual behavior can be attributed to factors like excessive alcohol and drug use, research that involves these factors should be included. This inclusion will aid healthcare professionals, service providers, social service agencies, and community programs in the development of policies and procedures that call for the discussion of these risk factors with patients routinely. While the aim is to link newly diagnosed HIV patients to care, those suffering from addiction and dependency will also need to be linked to the social services that deal with addiction. Given advancing age, programs that provide an integrative model of care would be advantageous.

Results from this study further imply that health education materials and information should be easily accessible to seniors and should involve healthcare professionals where appropriate with testing being offered. In order to achieve these aims, strategies like (a) additional public awareness campaigns similar to the GTCV campaign that specifically targets the senior population to be tested for HIV; (b) providing HIV testing centers and opportunities for seniors to be tested (e.g., at neighborhood pharmacies); (c) engaging and training medical professionals to routinely assess HIV risk factors in patients over 50; (d) acknowledging that the face of HIV is changing (i.e., people are living longer lives with the disease, including sexually active seniors, older IV drug users and women are increasingly at higher rates of HIV among seniors) and thus seniors need to be encouraged to tested for HIV if they are engaging in such behaviors; and (e) dispelling myths, misinformation, and misconception about senior HIV risk susceptibility in those over 50.

With the uncertainty surrounding healthcare in the United States, continuing to ensure that seniors have access to insurance to cover HIV testing is key. In addition, developing clinical protocols that address treatment guidelines for people over the age of 50 have implications for testing and treatment of seniors and HIV.

Study Limitations

This study used secondary data based on survey responses from the community survey conducted by HARC in Palm Springs, California. The survey assessed HIV testing behavior among residents of the Coachella Valley, California. For the purpose of this study, data representing seniors over the age of 50 was extracted from the total HARC data set. The study was a non-randomized study. Consequently, this study cannot be generalizable to all seniors in the United States regarding HIV testing behavior or even to those in the state of California.

Another limitation is that causality cannot be attributed. While study results can illustrate some contributing or correlational factors regarding seniors and low rates of HIV testing among this group, a definitive causality cannot be proven. The study results also cannot make irrefutable causal conclusions, it can however provide insight into HIV testing behavior among seniors and why this demographic is or is not being tested for HIV.

The HARC (2014) survey asked participants to self-report on questions such as "Have you EVER been tested for HIV, the virus that causes AIDS?" Self-reporting data can result in bias in a research study with the researcher relying on the honesty and factual recall of participants. Self-reporting can sometimes result in social desirability bias. Maccoby and Maccoby (1954) described social desirability bias as a phenomenon where respondents are often unwilling to accurately report on questions they deem sensitive. Maccoby and Maccoby explained that they are also likely to provide answers they believe the interviewer wants to hear. This phenomenon can threaten the reliability and validity of a research study. To mitigate these limitations, Fisher (1993) suggests using indirect questioning where respondents are asked structured questions from the perspective of others. Future researchers should consider this strategy.

In reviewing studies on HIV and seniors, some studies classified seniors as those over the age of 50 years old as a marker, while other studies on HIV and aging classified seniors and elderly as 65 or older primarily because 65 is the age at which benefits for older Americans begin. For the purposes of this study, seniors were identified as those 50 years and over. Study findings should therefore be accepted with caution given gaps in age. Further, when examining HIV testing behavior between age groupings, a larger sample may be needed to test the significance of study results. For this research study, the archival data used showed there were

116 people over the age of 50; 83 over the age of 60; 19 people over the age of 70; and 2 people over the age of 80. In the over 80 age group, there were limited participants to extract from the larger sample when looking at HIV testing behavior among age groups.

This study might have benefitted from being a longitudinal study rather than a cross sectional study. Additional insights might have been gained by following the seniors over a period of time. Using secondary data did not allow for this type of study and age of respondents could have an impact of a long term study.

Finally, it should be noted that the HBM as a theoretical model does not take into account environmental or economic factors that may prevent an individual from making a specific behavior change.

Summary and Conclusion

Using archival data from the HARC (2014) community survey, the results from this research study demonstrated that there is a significant statistical difference in HIV testing behavior among senior age groupings. Further, the results supported the null hypothesis that there is no correlation between routine health screenings and getting an HIV test. Getting routine health screenings cannot be used as a predictor for seeking or receiving an HIV test among senior groups. Finally, examining the reasons why or why not seniors are being tested for HIV provided good empirical data that supports the need for effective strategies to increase testing among this vulnerable population. Coupling the HBM theory and model with the results from this study allows for the assessment of perceived risk about seniors and HIV testing behavior. It explains the lack of participation in HIV testing even given all the education about the risks associated with contracting the disease. Further, it provides the evidence of confounding factors that should be considered in addition to perceived risk for lack of HIV testing among seniors (e.g.,

healthcare professionals not consistently screening senior patients for HIV as advised by the CDC guidelines). Without early screening and detection, late diagnosis and poor prognosis in the elderly can result. This research study can serve as a catalyst to provide an impetus for future research, training, and policy implementation to ensure that vulnerable populations like seniors are protected against HIV.

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Appendix A: Coachella Valley Health Screening Survey

Please complete this confidential survey to help us understand health screening behaviors in Coachella Valley. By completing this survey, you will be entered to win one of TEN $50 Visa cards! Please mail your completed survey to: Get Tested Coachella Valley, ATTN: Susan Unger, 1695 N. Sunrise Way, Palm Springs, CA, 92262.

1. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Transgender: Male to Female
- ☐ Transgender: Female to Male
- ☐ Other: _____

2. How would you describe your ethnicity?

- ☐ Hispanic/Latino
- ☐ Not Hispanic/Latino

3. How would you describe your race? Please check all that apply.

- ☐ White/Caucasian
- ☐ Black/African American
- ☐ Asian/Pacific Islander
- ☐ American Indian/Alaska Native
- ☐ Other: _____

4. How old are you? _____

5. What is your household income before taxes?

- ☐ $24,999 or less
- ☐ $25,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 or more

6. What city do you live in?

- ☐ Bermuda Dunes
- ☐ Cathedral City
- ☐ Coachella
- ☐ Desert Hot Springs
- ☐ Indian Wells
- ☐ Indio
- ☐ La Quinta
- ☐ Mecca
- ☐ Palm Desert
- ☐ Palm Springs
- ☐ Rancho Mirage
- ☐ Thermal
- ☐ Thousand Palms
- ☐ Other: _____

7. On average, how often do you…

	Every day	A few times a week	A few times a month	A few times a year	Never
Watch TV					
Listen to the radio					
Read the newspaper					
Use the internet					

8. Have you been tested for any of the following health conditions in the past 5 years?

	Yes, I have been tested	No, I have not been tested
High cholesterol		
High blood pressure		
Diabetes		

9. Please indicate if the following statements are true or false.

	True	False
I get a routine check-up with a doctor about once a year		
I get a flu shot almost every year		
I have access to healthcare when I need it		

10. In the past 10 years, have you had any type of sex (including oral, anal, or vaginal) with:

- ☐ Men only
- ☐ Women only
- ☐ Both men and women
- ☐ Not applicable—I have not had sex in the past 10 years

11. Have you EVER been tested for HIV, the virus that causes AIDS?

Do NOT count tests you may have had as part of a blood donation, but DO include all other types of HIV tests.

- ☐ Yes (skip to question #12 on the other side)
- ☐ No (skip to question #15 on the other side)

If you have any questions or concerns about this survey, please contact Dr. Jenna LeComte-Hinely, the Director of Research and Evaluation, at Health Assessment Resource Center (HARC, Inc.): 760-404-1945, jlecomte-hinely@harcdata.org

If you HAVE been tested for HIV:

12. Why did you choose to get tested for HIV? Please check all that apply.

- ☐ I was concerned I might have been exposed to HIV
- ☐ My sexual partner is HIV positive
- ☐ My healthcare provider offered to do the test
- ☐ It was offered for free at an event or community location
- ☐ It was required by my employer or insurer
- ☐ Experts recommend that everyone get tested, so I did
- ☐ My friend or family member said testing is a good idea, so I got tested
- ☐ Other: _____

13. What YEAR was your last HIV test?

_____

14. Where was your last HIV test?

- ☐ At a doctor's office
- ☐ At a community clinic
- ☐ At the hospital or emergency room (ER)
- ☐ In jail or prison
- ☐ At a drug treatment facility (rehab)
- ☐ At home
- ☐ At a health fair, testing van, or event
- ☐ At a local business or store
- ☐ Other: _____

If you HAVEN'T been tested for HIV:

15. Why haven't you been tested for HIV? Please check all that apply.

- ☐ I don't think I'm at risk for getting HIV
- ☐ I'm not sexually active
- ☐ My doctor/healthcare provider has never offered to test me for HIV
- ☐ I don't want my doctor or anyone else to judge me
- ☐ I'm too embarrassed to get tested
- ☐ I don't WANT to know if I have HIV
- ☐ I don't know where to get tested
- ☐ I don't have the transportation needed to get to a testing site
- ☐ I can't afford to get tested
- ☐ I don't have health insurance
- ☐ Other: _____

16. If your doctor or other healthcare provider offered to test you for HIV (and the test was free and/or covered by your insurance), would you get tested?

- ☐ Yes
- ☐ No

FOR EVERYONE:

17. Who do you think should be tested for HIV? Please choose the response that best fits your feelings.

- ☐ No one needs to be tested
- ☐ Only those people with high risk of getting HIV, like gay men or drug users, need to be tested
- ☐ All sexually active people need to be tested
- ☐ All adults and teens need to be tested

18. If you were to be tested for HIV in the next year, which of these locations would be a comfortable testing site for you? Please check all that apply.

- ☐ At a doctor's office
- ☐ At a community clinic
- ☐ At the hospital or emergency room (ER)
- ☐ At a drug treatment facility (rehab)
- ☐ At home
- ☐ At a health fair, testing van, or other community event
- ☐ I would not be comfortable getting tested at any of these sites

Thank you for participating! If you would like to be entered to win one of ten $50 Visa cards, please give us your contact info. This info will ONLY be used to contact the winner and will NEVER be linked to your individual responses or shared with anyone.

First Name: _____ Phone or email address: _____

If you have any questions or concerns about this survey, please contact Dr. Jenna LeComte-Hinely, the Director of Research and Evaluation, at Health Assessment Resource Center (HARC, Inc.): 760-404-1945, jlecomte-hinely@harcdata.org

Appendix B

Appendix B: Encuesta de Salud para el Valle de Coachella

Por favor complete esta encuesta confidencial para ayudarnos a entender los comportamientos de detección de salud en el Valle de Coachella. Al completar esta encuesta, se le inscribirá para ganar una de diez tarjetas Visa $ 50! Por favor envíe su encuesta completada a: Hágase la prueba de Coachella Valley, Atención: Susan Unger, 1695 N. Sunrise Way, Palm Springs, CA, 92262.

1. ¿Cuál es su genero?

- ☐ Hombre
- ☐ Mujer
- ☐ Transgénero: macho a hembra
- ☐ Transgénero: Hembra a macho
- ☐ Otros: _____

2. ¿Cómo describiría su origen étnico?

- ☐ Hispanos/Latinos
- ☐ No Hispano/Latino

3. ¿Cómo describiría su raza? Por favor, marque todas las que apliquen.

- ☐ Blanco / Caucásico
- ☐ Negro / Afroamericano
- ☐ Asiático / Islas del Pacífico
- ☐ Los Indios Americanos / Nativos de Alaska
- ☐ Otros: _____

4. ¿Cuántos años tiene?_____

5. ¿Cuál es su ingreso familiar antes de impuestos?

- ☐ $24,999 o menos
- ☐ $25,000 a $49,999
- ☐ $50,000 a $74,999
- ☐ $75,000 o más

6. ¿En qué ciudad vive usted?

- ☐ Bermuda Dunes
- ☐ Cathedral City
- ☐ Coachella
- ☐ Desert Hot Springs
- ☐ Indian Wells
- ☐ Indio
- ☐ La Quinta
- ☐ Mecca/ La Meca
- ☐ Palm Desert/ Desert Palm
- ☐ Palm Springs
- ☐ Rancho Mirage
- ☐ Thermal/ Termal
- ☐ Thousand Palms/ Mil Palmas
- ☐ Other: _____

7. En promedio, ¿con qué frecuencia ...

	Cada dia	Varias veces a la semana	Varias veces al mes	Varias veces al año	Nunca
Ve la television					
Escucha el radio					
Lee el periodico					
Usa la internet					

8. ¿Se ha echo la prueba de cualquiera de las siguientes condiciones de salud en los últimos 5 años?

	Si, me he hecho la prueba	No, me he hecho la prueba
Colesterol alto		
Alta presion		
Diabetes		

9. Indique si las siguientes frases son verdaderas o falsas.

	Verdadera	Falsa
Me hago un chequeo de rutina con un médico una vez al año		
Recibo una vacuna contra la gripe casi todos los años		
Tengo acceso médico cuando lo necesite		

10. En los últimos 10 años, ¿ha tenido algún tipo de sexo (incluyendo sexo oral, anal o vaginal) con:

- ☐ Sólo hombres
- ☐ Sólo mujeres
- ☐ Tanto los hombres como las mujeres
- ☐ No es aplicable - no he tenido relaciones sexuales en los últimos 10 años

11. ¿Alguna vez se ha hecho la prueba del VIH, el virus que causa el SIDA? No cuente las pruebas que pueda haber tenido, como parte de una donación de sangre, pero si incluya a todo otro tipo de pruebas de VIH.

- ☐ Sí (pase a la pregunta # 12 en el otro lado)
- ☐ No (pase a la pregunta # 15 en el otro lado)

Si usted tiene alguna pregunta o inquietud acerca de esta encuesta, por favor póngase en contacto con HARC: Dr. Jenna LeComte-Hinely, jlecomte-hinely@harcdata.org, 760-404-1945

Si usted ha hecho la prueba del VIH:

12. ¿Por qué decidió hacerse la prueba del VIH? Por favor, marque todas las que apliquen.

- ☐ Me preocupaba que podría haber estado expuesto al VIH
- ☐ Mi pareja sexual es VIH positivo
- ☐ Mi proveedor de atención médica se ofreció a hacer la prueba
- ☐ Se ofrecio de forma gratuita en un evento o ubicación de la comunidad
- ☐ Se requiere por mi empleador o asegurador
- ☐ Los expertos recomiendan que todas las personas se hagan la prueba, así que lo hice
- ☐ Mi amigo o miembro de la familia dijeron que la prueba es una buena idea, así que me dieron prueba
- ☐ Otros: _____

13. ¿En qué año fue su última prueba de VIH?

_____

14. ¿Dónde fue su última prueba de VIH?

- ☐ En el consultorio de un médico
- ☐ En una clínica de la comunidad
- ☐ En el hospital o sala de emergencia (ER)
- ☐ En la cárcel o prisión
- ☐ En una instalación de tratamiento de drogas (rehabilitación)
- ☐ En la casa
- ☐ En una feria de salud, una van de pruebas, o evento
- ☐ En un negocio local o tienda
- ☐ Otros: _____

Si usted no ha hecho la prueba del VIH:

15. ¿Por qué no se la ha echo? Por favor, marque todas las que apliquen.

- ☐ No creo que estoy en riesgo de contraer el VIH
- ☐ No soy sexualmente activa/o
- ☐ Mi médico / proveedor de cuidado de la salud nunca ha ofrecido a la prueba del VIH
- ☐ Yo no quiero que me juzgan mi médico o cualquier otra persona
- ☐ Estoy demasiado avergonzado como para hacerse la prueba
- ☐ No quiero saber si tengo el VIH
- ☐ No sé dónde hacerme la prueba
- ☐ No tengo el transporte necesario para llegar a un lugar de la prueba
- ☐ No puedo darme el lujo de hacerme la prueba
- ☐ No tengo seguro de salud
- ☐ Otros: _____

16. Si su médico o otro profesional de salud le ofrecen a usted la prueba del VIH (y la prueba fuera gratis y / o cubierta por su seguro), se haría la prueba?

- ☐ Si
- ☐ No

PARA TODOS:

17. ¿Quién cree usted que debería hacerse la prueba del VIH? Por favor, elija la respuesta que mejor se adapte a sus sentimientos.

- ☐ Nadie debe se la debería de hacer
- ☐ Sólo las personas con alto riesgo de contraer el VIH, como los hombres homosexuales y asadores de drogas, deben hacérsela
- ☐ Todas las personas sexualmente activas
- ☐ Todos los adultos y los adolescentes necesitan hacerce la prueba

18. Si se va a hacerse la prueba del VIH en el próximo año, ¿cuál de estos lugares sería un sitio de pruebas cómodo para usted? Por favor, marque todas las que apliquen.

- ☐ En el consultorio de un médico
- ☐ En una clínica de la comunidad
- ☐ En el hospital o sala de emergencia (ER)
- ☐ En una instalación de tratamiento de drogas (rehabilitación)
- ☐ En la casa
- ☐ En un evento de feria de la salud, una van de pruebas, u otra comunidad
- ☐ No estaría cómoda hacerme la prueba en cualquiera de estos sitios

Gracias por participar! Si usted desea ser registrado para ganar una de diez tarjetas Visa $ 50, por favor nos da su información de contacto. Esta información será utilizada SOLAMENTE para ponerse en contacto con el ganador y NUNCA será conectado a sus respuestas individuales o compartida con nadie.

Nombre: _____ Teléfono o correo electrónico: _____

Si usted tiene alguna pregunta o inquietud acerca de esta encuesta, por favor póngase en contacto con HARC: Dr. Jenna LeComte-Hinely, jlecomte-hinely@harcdata.org, 760-404-1945