University of Texas at El Paso
ScholarWorks@UTEP

Open Access Theses & Dissertations

2022-12-01

Exploration And Analysis Of Attitudes And Determinants Toward Undetectable Equals Untransmittable (u=u) Among Minority Women

Roberta Marie Thimbriel
University of Texas at El Paso

Follow this and additional works at: https://scholarworks.utep.edu/open_etd

 Part of the Public Health Education and Promotion Commons

Recommended Citation

Thimbriel, Roberta Marie, "Exploration And Analysis Of Attitudes And Determinants Toward Undetectable Equals Untransmittable (u=u) Among Minority Women" (2022). *Open Access Theses & Dissertations*. 3739.
https://scholarworks.utep.edu/open_etd/3739

This is brought to you for free and open access by ScholarWorks@UTEP. It has been accepted for inclusion in Open Access Theses & Dissertations by an authorized administrator of ScholarWorks@UTEP. For more information, please contact lweber@utep.edu.

EXPLORATION AND ANALYSIS OF ATTITUDES AND DETERMINANTS TOWARD UNDETECTABLE EQUALS UNTRANSMITTABLE (U=U) AMONG MINORITY WOMEN

ROBERTA M. THIMBRIEL

Doctoral Program in Interdisciplinary Health Sciences

APPROVED:

_____
Thenral Mangadu, Ph.D., Chair

_____
Jeannie Concha, Ph.D.

_____
Yok Fong Paat, Ph.D.

_____
Emre Umucu, Ph.D.

_____
Ogechika Alozie, M.D.

_____
Stephen Crites, Ph.D.
Dean of the Graduate School

Copyright©

By

Roberta M. Thimbriel

2022

DEDICATION

To

All the women in Belize whose lives have been or are affected directly or indirectly by HIV/AIDS – you inspired me for this study.

EXPLORATION AND ANALYSIS OF ATTITUDES AND DETERMINANTS TOWARD UNDETECTABLE EQUALS UNTRANSMITTABLE (U=U) AMONG MINORITY WOMEN

By

Roberta M. Thimbriel, M.S., M.Ed., MLS (ASCP)[cm]

DISSERTATION

Presented to the Faculty of the Graduate School of

The University of Texas at El Paso

in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

Interdisciplinary Health Sciences Doctoral Program

THE UNIVERSITY OF TEXAS AT EL PASO

December 2022

ACKNOWLEDGEMENTS

I want to acknowledge my husband, Earlin, for his support and personal sacrifice, in so doing. My children, Elijah, Nathaniel, and Erilynn, for being sources of immeasurable strength to me during this dissertation, especially my six-year-old daughter, for her sweet words and notes of love and encouragement throughout my doctoral journey.

I am forever grateful to the women who participated in this study. They were so kind and bold in sharing their experiences with me. Without their contributions, this study would not be possible. Thank you! Also, the leaders of the local community-based organizations (CBOs) who generously allowed me to access participants through their facilities and affiliations despite the challenges of the ongoing COVID-19 pandemic.

Thanks to the Program Coordinators and Research Assistants at the Minority AIDS Research Center (MARC) in the College of Health Sciences (CHS) for their invaluable help with language needs in my dissertation and for being supportive throughout my study.

Special thanks to the Interdisciplinary Health Sciences (IHS) Department for the GRAs and the Dissertation Completion Grant, and UTEP Graduate School for the Dodson Grant, which funded this dissertation, and the P.E.O. International for the International Peace Scholarships.

Last but not least, thank you to my committee members: Drs. Thenral Mangadu, Jeannie Concha, Yok Fong Paat, Emre Umucu, and Ogechika Alozie for their contributions to this monumental achievement. Special thanks to my mentor and dissertation chair, Dr. Mangadu, for her unwavering support and guidance through this journey. I would also like to acknowledge Dr. Jacen Moore and Dr. Igor Almeida for their assistance in my early doctoral pursuit. Thanks to Darlene Muguiro, all my IHS colleagues, P.E.O. Chapter members, and my extended family for your support and help throughout this season in my life.

ABSTRACT

Purpose: To explore and assess awareness of and attitudes toward "undetectable equals untransmittable" (U=U) and associations with social-ecological factors among minority women. *Population*: Ethnic minority women 18 years and older residing in the El Paso, TX, US - Juarez, Mexico border region. *Methods*: A cross-sectional convergent parallel mixed methods study using in-depth interviews and a survey instrument was conducted among a purposive sample. Thematic analysis was done on qualitative data, and descriptive, bivariate and binary logistic regression analyses were done on quantitative data. *Results*: The majority of the participants (66.7% interviewees and 50.7% survey) were Hispanic, in their early-mid thirties, and had a substance use disorder (SUD). The interviewees' awareness of U equals U was low (23.8%) but high among survey participants (69.2%). Five major themes related to U equals U unawareness, awareness, discrepant beliefs and behaviors, positive attitudes, and stigma and discrimination resulted from interviews. Statistically significant odds of 1) believing in the accuracy of U equals U was found with HIV test, perceived HIV transmission risk with U = U, belief in HIV treatment as prevention (TasP), and community trust in U equals U; 2) perceiving no risk of HIV transmission with U = U was found with alcohol SUD, belief in the accuracy of U = U, and belief in the efficacy of HIV treatment among community members of same cultural background; and 3) engaging in condomless sex with U equals U was found with beliefs in TasP and whether people got along in their neighborhood. *Conclusion*: Both types of data showed low levels of belief in U equals U, high perceptions of HIV transmission risk, and strong unwillingness to engage in condomless sex with U equals U among racial/ethnic minority women in the border region. An integrated HIV testing service with education about TasP and U = U may increase this population's acceptance and trust in the efficacy of U = U.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS v

ABSTRACT vi

TABLE OF CONTENTS vii

LIST OF TABLES x

CHAPTER I - INTRODUCTION 1

Background 1

Statement of the research problem 9

Theoretical framework 10

Purpose of the study 31

Definition of measures of interest 31

Research questions 32

Specific Aims 32

Significance of the problem 34

Assumptions 36

CHAPTER II – LITERATURE REVIEW 38

HIV/AIDS Among Women Globally 38

HIV/AIDS in the U.S. 39

HIV incidence, prevalence and risk among minority women in the U.S. 42

Socioecological Factors that influence risk of HIV among minority women 43

HIV treatment and health outcomes among minority women 50

HIV treatment as prevention - undetectable equals untransmittable 56

Racial/ethnic minority women's attitude toward HIV prevention and treatment 59

Women's attitude toward biomedical/ART treatment as prevention and U=U 65
CHAPTER III - METHODS 72
Study design 72
Participants 73
Procedures 74
Measures 75
Awareness of and attitudes toward U=U – Qualitative data. 76
Awareness and attitudes toward U=U – Survey data. 77
Data Management 91
Data collection. 91
Data cleaning and handling. 91
Data Analysis 94
Protection of research participants and subjects 99
CHAPTER IV – RESULTS 101
Researcher's Reflection 101
Qualitative Interview Data Analysis 103
Demographics of interview participants. 104
Thematic analysis. 104
Quantitative Survey Data 130
Descriptive Statistics. 130
Individual factors. 130
Social Factors. 133
Logistic Regression Analysis. 134

Attitude outcome #1. Beliefs about the accuracy of U equals U 134
Attitude outcome #2. Perceptions of sexual risk of HIV transmission with U equals U 140
Attitude outcome #3 – Likelihood of condomless sex and U equals U. 146
CHAPTER V - DISCUSSION 153
Implications and future directions 166
Limitations and strengths 172
CHAPTER VI – CONCLUSION 174
Timeline 178
REFERENCES 180
APPENDICES 284
CURRICULUM VITA 346

LIST OF TABLES

Table 1: Interview Characteristics 230

Table 2: Demographics of Interview Participants (N = 21)..... 231

Table 3: Health–related Characteristics of Interview Participants 232

Table 4: General Patterns of Perceptions and Attitudes of Interview Participants..... 233

Table 5: Data Analysis Map – Research Domains and Emergent Themes 234

Table 6: Demographics of Survey Participants (N = 134)..... 239

Table 7: HIV-related Variables and U=U Awareness Among Survey Participants 241

Table 8: Health-related Variables Among Survey Participants..... 242

Table 9: Social Media Use Among Survey Participants..... 243

Table 10: Individual Attitude Towards PLWHA Among Survey Participants 244

Table 11: Interpersonal Factors Among Survey Participants 245

Table 12: Organization, Community and Neighborhood Factors Among Survey Participants . 246

Table 13: Bivariate Associations between Belief in the Accuracy of U Equals U and Demographic Characteristics..... 248

Table 14: Statistically Significant Bivariate Associations with HIV-related Variables and Beliefs in the Accuracy of U Equals U 252

Table 15: Statistically Significant Bivariate Associations with Beliefs in the Accuracy of U Equals U and Health-related Variables..... 253

Table 16: Statistically Significant Bivariate Associations with Beliefs in the Accuracy of U Equals U and Individual Attitudes..... 255

Table 17: Statistically Significant Bivariate Associations between Beliefs in the Accuracy of U Equals U and Organization, Community and Neighborhood Factors 256

Table 18: Binary Logistic Regression Model 1 for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117) 259
Table 19: Final Binary Logistic Regression Model (6) for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117) 261
Table 20: Bivariate Associations between Perceptions of Risk of Transmission with U Equals U and Demographic Characteristics 263
Table 21: Statistically Significant Bivariate Associations with Perceptions of Risk of HIV Transmission with U Equals U and Health-related Variables 267
Table 22: Statistically Significant Bivariate Associations with Perceptions of Risk of HIV transmission with U Equals U and Individual Attitudes 269
Table 23: Statistically Significant Bivariate Associations between Perceptions of Risk of HIV transmission with U Equals U and Organization, Community and Neighborhood Factors 270
Table 24: Binary Logistic Regression Model 1 for Perceptions of Risk of HIV Transmission with U equals U (Outcome #2) Among Racial/Ethnic Minority Women (N = 115) 273
Table 25: Final Regression Model (6) for Perception of No Transmission Risk with U equals U (Outcome #2) Among Racial/Ethnic Minority Women (N = 125) 275
Table 26: Significant Bivariate Associations with Likelihood of Having Condomless Sex with U Equals U Among Minority Women 277
Table 27: Final Regression Model (6) for Likelihood of Engaging in Condomless Sex with U equals U (Outcome #3) Among Minority Women (N = 129) 279
Table 28: Implications of U=U 287

LIST OF FIGURES

Figure 1: Phases of Thematic Analysis. 94

Figure 2: Beliefs about U equals U accuracy by race/ethnicity. 280

Figure 3: Beliefs about U equals U accuracy by the highest level of education completed. 280

Figure 4: Beliefs in the accuracy of U equals U by cultural beliefs in the effectiveness of HIV treatment. 281

Figure 5: Perception of risk of transmission by race/ethnicity. 281

Figure 6: Perceptions of risk of HIV transmission with U equals U by awareness of U equals U 282

Figure 7: Perceptions of risk of HIV transmission by beliefs about the accuracy of U equals U. 282

Figure 8: Likelihood of condomless sex with U equals U by race/ethnicity. 283

Figure 9: Percentages of Stage 3 (AIDS) Classifications among Female Adults and Adolescents with Diagnosed HIV Infection by Race/Ethnicity and Year of Classification 1985–2017—United States and 6 Dependent Areas. 284

Figure 10: Conceptual model of U=U research 285

Figure 11: Theoretical Framework of Study 286

CHAPTER I - INTRODUCTION

Background

HIV as a global, national, and local public health problem

Globally, HIV/AIDS (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome) continues to be a global public health concern despite decreases in new HIV infections and AIDS-related deaths (Joint United Nations Programme on HIV/AIDS, [UNAIDS], 2015; UNAIDS, 2020b). In 2019, 38 million people were living with HIV/AIDS (PLHIV) around the world, an illness that has no cure, and of these, approximately 1.8 million were children under 15 years old (UNAIDS, 2020b). About 1.7 million new infections and 770,000 HIV/AIDS deaths occurred in 2018 (UNAIDS, 2019). The United States (U.S.) also continues to have an HIV epidemic with 1.2 million PLHIV (HIV.gov, 2020) and the majority of those affected being Black/African Americans (42% or 476,100) followed by Hispanics (19% or 254,600) in 2019 (Kaiser Family Foundation, [KFF], 2020a; KFF, 2014). Although the incidence of HIV has been reduced by two-thirds since the start of the pandemic in the U.S., it has plateaued since 2013 (Centers for Disease Control and Prevention, [CDC], 2019a; CDC, 2019). Even more concerning is the fact that the trends among racial/ethnic minorities have not changed in terms of new diagnosis; Blacks/African Americans accounted for 43% of the 38,500 new infections in 2018 and deaths, 44% due to HIV/AIDS despite only making up 13% of the population (Avert, 2019; CDC, 2020a; CDC, 2018; KFF, 2020a). Hispanics accounted for 27% of new HIV infections in 2018 (Avert, 2019; CDC, 2019; CDC, 2020b).

In Texas, incidence rates of new HIV infections exceeded the national rate (15.6 vs. 11.4 per 100,000) in 2018 (CDC, 2019); Hispanics had the largest proportion accounting for 40.2% of these new cases (Texas Health and Human Services, [THHS], 2019). El Paso County, a U.S.-

Mexico border community and predominantly Hispanic (83%) (United States Census Bureau, 2019), had a rate of 16.3 per 100,000 new cases in 2018 (THHS, 2019). Hispanics were the leading group for new infections in El Paso County, TX, in 2018 as well (Texas Department of State Health Services, [TDSHS], 2019). Moreover, Hispanic/Latino accounted for 85% of PLHIV in the Pan-West and West Texas HIV Service Delivery Areas (HSDAs), including El Paso, and more than 1 out of 10 PLHIV were female (New Solutions, 2013).

HIV incidence, prevalence, and risk among minority women

In addition to race/ethnicity, gender is another area of disparity for HIV/AIDS globally and in the U.S. Women and girls continue to be vulnerable across regions. They account for 48% of all infections globally and as high as 59% in Sub-Saharan Africa, where the main mode of transmission is heterosexual (UNAIDS, 2020a; UNAIDS, 2020b). Approximately 23% of PLHIV were females in the U.S. in 2016 (CDC, 2019b), reflecting trends seen from the late 1990s (Miller, Exner, Williams, & Ehrdhardt, 2000) after the emergence of the pandemic. Hispanic women are the second leading ethnic group among women living with HIV (WLHIV) in the nation and this region (CDC, 2019, 2020b). Hispanic women made up 18% of new HIV among women in the U.S. (CDC, 2020b) and 18% of new HIV infections among all Hispanics (men and women combined) in 2016 (CDC, 2019b). Black women, in particular, are disparately affected, having 58% of new cases among all women in 2018 (KFF, 2020a) and also have the highest rate among women in this regional HSDA (PanWest-West Texas Ryan White Programs, [PWTRWP], 2013). What is most concerning is that the trends in the number of new HIV cases and advanced disease stage at diagnosis among women have remained constant, with slight decreases among Black and Hispanic women from 2010 - 2017; however, Black women continue to be the most affected (CDC, 2018). Unfortunately, despite sharing a high burden of

the HIV epidemic in the nation, women were generally not actively involved in HIV research, prompting a statement by top public health experts to include women and girls in HIV clinical trials, and to empower them with new modes of HIV prevention that place control in their hands (National Institutes of Health, [NIH], 2006).

Poverty, racism, structural violence, stigma and discrimination, gender inequalities and health inequities remain key drivers of the pandemic globally (KFF, Avert, 2018a; 2020b). Factors that increase and drive women's risk for HIV in the U.S. are similar and include gender inequalities, intimate partner violence (IPV) (Morales-Alemán et al., 2014), which is reinforced through social and cultural norms, and sexual abuse (Wendlandt, Salazar, Mijares, & Pitts, 2016). In addition, the Syndemic theory also highlights the synergistic negative effects of violence, co-occurring mental health disorders and substance use disorders (SUD), and low socioeconomic status (SES) that increase HIV risk and progression of AIDS among minority women (Batchelder, Gonzalez, Palma, Schoenbaum, & Lounsbury, 2015).

Intimate partner violence: a risk factor. Exposure to and experience of violence increase women's risk of HIV by 1.5 times (UNAIDS, 2020a). About 20% of women in the U.S. experience IPV and a quarter experience severe forms of abuse (CDC, 2019). Among Black women, the rates of violence are higher. A rate of 29.1% was found in a study with predominantly Black and Hispanic women (Morales-Alemán et al., 2014).

Mental health disorders: a risk factor. Mental health disorders such as depression and anxiety, as well as SUD, are also associated with an increased risk of HIV (González-Guarda, Florom-Smith, & Thomas, 2011; Gonzalez-Guarda, Vasquez, Urrutia, Villarruel, & Peragallo, 2011). Those with mental disorders are more at risk for HIV as they are more likely to have multiple partners and trade sex for money (McKinnon, Cournos, Sugden, Guido, & Herman,

1996). These behaviors are also more likely to occur among those in metropolitan areas (Brunette et al., 1999). Women are disproportionally affected by mental disorders compared to men, leading to increased vulnerability to HIV risk behaviors (National Alliance on Mental Illness, 2019; National Institute of Mental Health, 2019). Moreover, research has shown that RSBs occur at higher rates among women with mental disorders compared to those without mental disorders (Costa, Silva, & Pereira, 2017; Meade & Sikkema, 2005a, 2005b; Weinhardt, Carey, & Carey, 1998).

Mental health problems, specifically depression and posttraumatic stress disorder (PTSD), are increased by IPV, resulting in a cycle of violence and risk (Golding, 1999). Both PTSD and mental disorders have been shown to increase women's susceptibility to high-risk behaviors (Cavanaugh, Hansen, & Sullivan, 2010). PTSD resulting from IPV was a predictor of unprotected sex with high-risk partners such as IDU and HIV-positive individuals (Cavanaugh et al., 2010).

Substance use disorders: a risk factor. Studies have also shown an association between PTSD and HIV risk among people with SUD (Weiss, Tull, Borne, & Gratz, 2013) and depression (Marshall et al., 2013), serious mental illness (Rosenberg et al., 2001), and drug dependency (Narvaez et al., 2019). In addition, Native American women were more likely to engage in unprotected sex and have more than one partner when they engaged in binge drinking and had PTSD symptoms (Pearson et al., 2015). These risk factors are compounded by the deleterious effects due to multifaceted stigmatization based on race, IDU and HIV/AIDS status and poverty (Shayne & Kaplan, 1991). Unfortunately, the same factors that drive risk among women also contribute to health outcomes among women infected with HIV.

Health outcomes among racial/ethnic minority women with HIV

Health outcomes for people at risk for HIV and PLHIV are usually measured through the 90-90-90 targets set by the United Nations, which stipulate that 90% of the people with HIV should know their status, 90% should be retained in care, and 90% achieve viral suppression (UNAIDS, 2014). The latter outcome can also be indirectly observed through the rates of advanced disease stage at diagnosis, i.e., AIDS, late diagnosis and HIV/AIDS-related deaths. Consequently, Black women in the U.S. have consistently experienced poorer health outcomes with higher rates of advanced disease stage of AIDS at HIV diagnosis and higher death rate (57.5%) since the early 1980s (see Appendix A) besides having a larger risk of HIV infection at 14 times the rate of White and 5 times the rate of Hispanic women (CDC, 2020a; CDC, 2018; KFF, 2020a). Viral suppression is low among minority groups in El Paso, TX as well (CDC, 2018; Vaaler, Surita, O'Hara, & Ripperger-Suhler, 2014) despite having a concentrated epidemic among these groups — 85% of the 2,249 PLHIV are Hispanic as of 2018 (TDSHS, New Solutions, 2013; 2019). In El Paso, only 34% of PLHIV were retained in care and only 25% reached viral suppression in a one-year follow-up in Texas in 2011-2013 (Vaaler et al., 2014). Evidently, these proportions have increased to more than two-thirds in 2017 (Ovalle-Valdez, n.d.-b).

Viral suppression is preceded by ART adherence. Many barriers to ART adherence exist at different levels of the Socioecological Model (SEM) of health promotion and disease prevention. SES, cost, transportation, lack of support, gender and cultural norms, HIV-related stigma, whether perceived or enacted by community members and geopolitical factors such as immigration status are some of the frequently found barriers to ART adherence and, by extension, viral suppression (Hargreaves et al., 2018; R. C. Patel et al., 2016; Thomford,

Mhandire, Dandara, & Kyei, 2020). Among PLHIV, trauma from IPV, in addition to mental disorders and stigma, has been associated with worse health outcomes and increased sexual risk (Whetten, Reif, Whetten, & Murphy-McMillan, 2008). ART adherence as prevention is limited by these social determinants; thus, it is important to explore their impact on the attitudes toward this U=U concept (Bavinton & Rodger, 2020; Cohen, Pepperrell, & Venter, 2020).

HIV treatment as prevention - undetectable equals untransmittable

The undetectable equals untransmittable (U=U) concept rests on the premise that if an individual has less than 200 copies of HIV 1 RNA circulating in their blood that is not detected by HIV tests, then effectively, the individual is not able to transmit the virus to an HIV negative person (Rodger, et. al., 2018; Rodger, et al., 2016). The U=U concept gained scientific support through several prospective observational studies and through randomized control trials investigating the treatment as prevention (TasP) model (Bavinton, et al., 2018; Cohen, et al., 2016; Cohen, et al., 2011; Rodger, et al., 2019). The TasP emphasizes that medications such as preexposure prophylaxis (PrEP) and postexposure prophylaxis (PEP) in HIV-negative persons (CDC, 2016b) and antiretroviral treatment (ART) in HIV-positive individuals can be used to prevent transmission and subsequently reduce the incidence and prevalence of HIV (Cohen, et al., 2016).

The TasP through sexual contact and U=U paradigms were conceived through the HIV Prevention Trials Network (HPTN 052) investigations that revealed that those on early ART prevented over 93-96% of HIV transmissions (Cohen, et al., 2016; Cohen, et al., 2011). The PARTNER study further solidified the concept of TasP and U=U among both heterosexual and homosexual serodiscordant couples who engaged in condomless sex and whose index case (i.e., HIV-positive partner) was adherent to ART and had a viral load below 200 copies/mL (Rodger,

et al., 2019; Rodger, et al., 2016). The Opposites Attract study, which was composed entirely of homosexual couples, reported similar findings as the PARTNER studies (Bavinton, et al., 2018).

Minority women's attitude toward HIV prevention and treatment

Prior to the highly active antiretroviral therapy (HAART) era, Hispanic women did not know about ART, and they held many misconceptions about HIV prevention and treatment (Flaskerud & Calvillo, 1991). In general, women infected with HIV held very negative attitudes about treatment, particularly toward the early drug, azidothymidine or also called Zidovudine (AZT). Women expressed distrust toward providers prescribing the drug, questioning their motives for giving it to racial/ethnic minority women who were not a part of clinical trials for the medication; highlighted concerns about possible effects on unborn babies; and also shared their lack of adherence to the medication due to toxicity and negative side effects (Siegel & Gorey, 1997). Black women expressed greater negative attitudes toward HIV treatment compared to other ethnic women (Siegel & Gorey, 1997). Another study found similar negative attitudes among women infected with HIV and found that in addition to health professionals' influence and side effects, family beliefs and attitudes also influenced women's medication beliefs and adherence (Misener & Sowell, 1998). Despite the evidence that ART reduced vertical transmission from mother to child (Lallemant et al., 2000; Vithayasai et al., 2002), the quality of the patient-provider relationship (Sowell, Phillips, Murdaugh, & Tavokali, 1999) and most importantly, childbearing safety (Richter, Sowell, & Pluto, 2002) were important factors that greatly influenced women's decision to take ART. Others have found more complex emotional and social dimensions for intentional nonadherence among women (K. J. Roberts & Mann, 2003).

However, with the introduction of HAART, women across ethnicities expressed less negative attitudes toward ART, although still citing some medication side effects concerns (Schrimshaw, Siegel, & Lekas, 2005). African American women continue to have the greatest negative attitude toward treatment in the HAART era (Schrimshaw et al., 2005). Among this group of women, stigma played a major role in ART nonadherence, while social and healthcare providers' (HCP) support were identified as contributing factors among those who always adhered (Sankar, Luborsky, Schuman, & Roberts, 2002). Proceeding the HAART era, the U=U era now changes the goal of treatment from controlling or reducing disease progression to disease prevention. TasP has introduced the intervention of using biomedical treatment to prevent transmission of HIV through medications. Similar to the pre-HAART and HAART eras of under-representation of women in HIV prevention and treatment research (Sullivan, McNaghten, Begley, Hutchinson, & Cargill, 2007).

In the U=U era, there is also a major lack of women's voices toward biomedical prevention of HIV and the few studies that exist on the subject matter are mostly among sexual minority men (SMM) — a group comprising men who have sex with men (MSM), gay and bisexual men (GBM) and others — which show increasing awareness and acceptance of the U=U concept. Early studies among SMM found lower endorsement and beliefs in TasP among those HIV positive and negative (Holt et al., 2014) as well as for U=U (Carneiro, Westmoreland, Patel, & Grov, 2020); while later studies showed higher rates of trust in the U=U concept but perceptions of risk of transmission were still prevalent with a low proportion of participants agreeing that there is a zero risk of transmission under U=U during condomless sex (Rendina, Cienfuegos-Szalay, Talan, Jones, & Jimenez, 2020). Among mixed-gender studies, low awareness and negative attitudes prevail (Torres et al., 2020). An early study among PLHIV

found low endorsement of TasP (Kalichman et al., 2016) and a qualitative study in Kenya revealed that HIV-negative partners and medical providers had misunderstandings and doubts about the efficacy of the science behind the U=U research and distrust for its promise of protection against HIV transmission (Ngure et al., 2020).

Despite the scientific evidence of ART to prevent HIV transmission and the endorsement and promotion of this message by health officials at the highest public health office in the United States (U.S.), the National Institutes of Health (NIH), and in Switzerland (Eisinger, Dieffenbach, & Fauci, 2019; Guerrero, 2017; Vernazza & Hirschel, 2008), research has shown that there is widespread unawareness and lack of trust in the U=U message among the general population and among SMM. However, minority women at risk have not been included as a separate and vulnerable group in the U=U literature, and their beliefs and attitudes toward U=U are unknown. Therefore, there is a need to explore women's attitudes toward U=U.

Statement of the research problem

Women accounted for 19% of all new HIV diagnoses in 2018 in the U.S. and 18.1% in Texas in the same year (CDC, 2020; THHS, 2019). Ethnic minority women, predominantly Hispanic and Black, share the highest burden of HIV among women nationally (CDC, 2020), in the State of Texas (THHS, 2019) and locally in El Paso County (New Solutions, 2013). They also experience the poorest health outcomes, with the highest proportion of late HIV diagnoses with AIDS and death rate among women (CDC, 2018). Heterosexual contact and IDU continue to be primary modes of transmission for women (CDC, 2018) and caused 24% and 7%, respectively, of all new HIV infections in 2018 (CDC, 2020). However, heterosexual routes accounted for 92% and 88% of infections among Black and Hispanic women, respectively, in 2018 (CDC, 2018). Experience of IPV and SUD (Batchelder et al., 2016), which often co-occurs

with mental illness (Cavanaugh et al., 2010; El-Bassel, Gilbert, Vinocur, Chang, & Wu, 2011), place women, particularly racial/ethnic minority women at high risk for HIV infection and increase their likelihood of poorer health outcomes compared to non-Hispanic whites.

The epidemiological trends of HIV and socioecological factors that highlight the risk, prevention and treatment outcomes for racial/ethnic minority women, along with the implications for vertical transmission, make racial/ethnic minority women a priority group for exploring attitudes toward the U=U concept, much like the prioritization of MSMs in Australia toward TasP (Holt et al., 2014). Unfortunately, the majority of U = U studies have been among SMM (Carneiro et al., 2020; Rendina et al., 2020; Rendina & Parsons, 2018), mirroring the concentration of studies among these populations within the TasP paradigm (Holt et al., 2014; Wilkinson et al., 2018). The literature review conducted for this study indicates that the U=U concept and its implications have not been extensively investigated among minority women at risk for HIV in the U.S. nor in the El Paso, TX, US - Juarez, Mexico border region. Particularly, the impact of individual factors and social determinants on attitudes, beliefs and perceptions of HIV risk in the context of U=U has not been investigated in detail among this population. This study seeks to contribute to the literature on U=U concept and its implications for this highly susceptible and priority population of women.

Theoretical framework

The theories that guide and conceptualize this study on U=U are: Attitude theory (Thurstone, 1949), the Affective Behavioral and Cognitive (ABC) model (Breckler, 1984), which shows the components of attitude, and the theory of attitude formation (Bakanauskas, Kondrotienė, & Puksas, 2020); Health Belief Model (HBM; Janz & Becker, 1984) for HIV risk perception and its role in the affective and cognitive attitude domains; Theory of Reasoned

Action (TRA; Fishbein & Ajzen, 1975) showing the relationship between health-related behavioral attitudes and behavioral intentions, both of which are also influenced by social norms, which ultimately impacts engagement in health promotion and disease prevention behaviors; Syndemic Theory (Batchelder et al., 2015) which specifies HIV risk factors among minority women; and the SEM (McLeroy, Bibeau, Steckler, & Glanz, 1988) as a framework for HIV risk and prevention targets for health promotion and disease prevention at different levels within society.

Attitude Theory -attitude as a measurable construct

Attitude as a measurable construct is rooted in the field of Social Psychology (Severy, 1974). Early definitions of attitude that can be measured through expressed opinions include Thurstone's, which stated that attitude "denote the sum total of a man's inclinations and feelings, prejudice or bias, pre- conceived notions, ideas, fears, threats, and convictions about any specified topic" (Thurstone, 1928, p. 531). Simply stated, it is a "feeling toward something" (Severy, 1974). However, this feeling also can have varying strengths or intensities depending on the position of choice on the response scale (Thurstone, 1949). Later, Theorists conceptualized attitude as more than feelings but a complex construct that has distinct components. One researcher discussed the affective, cognitive and policy orientation aspects of attitudes, the latter referring to the action that people think should be done toward the attitude object (Smith, 1947). Wagner (1969) stated "an attitude is composed of affective, cognitive, and behavioral components that correspond, respectively, to one's evaluations of, knowledge of, and predisposition to act toward the object of the attitude," as cited in (Severy, 1974, p. 1). This tripartite attitude complex was named the ABC model (affective, behavioral and cognition) of

attitude and was empirically validated (Breckler, 1984). The ABC model of attitude was employed in this study to examine women's attitudes toward U=U.

The impact of attitude on behavioral intentions and behavior, although it has some shortcomings with inconsistent findings, has been well studied, and the relationship has been well supported (Thurstone, 1931), given the appropriate measurement protocols are utilized (Ajzen & Fishbein, 1977). This relationship is seen in the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (TPB) which expands on TRA to include behavioral control (Ajzen, 1991). TRA shows that attitudes are impacted by beliefs and evaluations of the behavior, i.e., the consequences or outcomes of the behavior, through the value-expectancy model of attitude, while TPB shows that attitudes are also impacted by subjective norms (social pressures) and perceived behavioral control (Ajzen, 1991). An earlier work also showed the importance of individual and modal beliefs as determinants and indicators of attitude (Thomas & Tuck, 1975). Using previous work (Ajzen, 2001, 2005; Bem, 1972) as a theoretical basis, Bakanauskas, Kondrotienė, & Puksas (2020) developed the Three-component Model of Attitude Formation. The authors showed that each of the tripartite aspects of the ABC model of attitude (Breckler, 1984) is formed from information and experiences within the domain of the component. The following excerpt captures the factors that influence attitude formation.

> *In summary, affective (emotional) attitudes are formed are influenced by internal factors such as an individual's desires, values, feelings, sensations, and other internal personal factors. In this case, the attitude is shaped by the internal psychological needs of the individual that can be met (expressing certain values, emotions, habits, regrets, etc.). Cognitively based attitudes are formed under the influence of external environmental*

> *stimuli, influenced by information received from the outside, or – as a result of the process of external socialisation – based on the associations between the object of the attitude and the external environment* (Bakanauskas et al., 2020, pp. 22-23).

Thus, the affective component of attitude is an emotional reaction toward the attitude object and is based on feelings, moral and religious beliefs, and value systems, not fact-based, and is subject to contextual change (Bakanauskas et al., 2020). The cognitive domain of attitude reflects what the individual knows and understands about the attitude object based on facts — i.e., the individual's experience, knowledge, information, beliefs and opinions, which are readily retrievable from memory — are shaped through advertisements, online sources, friends, family, formal and informal education, and social groups (Bakanauskas et al., 2020). Attitudes can be changed through the acquisition of new information in this domain. The third aspect of attitude formation, the conative or behavioral, is the action domain and is influenced by the cognitive domain or what is known about the object and also through vicarious learning from other's reactions or behavior toward the object or stimulus (Bakanauskas et al., 2020). The reaction can be a verbal or non-verbal expression of the affective component of attitude. Altogether the multicomponent model of attitude formation determines whether one has positive or negative attitudes toward health behaviors such as harm reduction, preventative behaviors or health-promoting behaviors (Bakanauskas et al., 2020). Moreover, external sources of information within society and personal experiences and prejudices contribute greatly to attitude formation. These may play significant roles in racial/ethnic minority women's attitudes toward U=U.

Health Belief Model (HBM)

The HBM is derived from Health Behavior Change Theory. This theory stipulates that health beliefs are influenced by knowledge, attitudes and norms in society and are critical for

health behavior change (McLeroy et al., 1988). Developed to determine people's lack of participation in prevention programs, the HBM consisted of four constructs: Perceived Susceptibility, Perceived Seriousness or Severity, Perceived Benefits and Perceived Barriers (Janz & Becker, 1984; Rosenstock, 1974). The model was later validated by others and found to have very good psychometric properties (Cummings, Jette, & Rosenstock, 1978; Janz & Becker, 1984). The HBM was later modified to include the domains of Self-efficacy and Cues to Action (Kegeles, 1980; Rosenstock, Strecher & Becker, 1988). However, it is critiqued for lacking factors related to social and cultural contexts, depth to determine the cause of behavior and perpetuating a victim-blaming perspective (Davidhizar, 1983; Raingruber, 2017).

Perceived susceptibility assesses the individual's perception of risk of getting the condition (Janz & Becker, 1984; Raingruber, 2017). Perceived severity is characterized as an individual's feelings about the seriousness of the disease from a biological perspective and also the consequences of this in relationships and responsibilities (Janz & Becker, 1984). The Perceived benefits are an evaluation of cost-effectiveness versus beliefs about the efficacy and feasibility of the available interventions (Janz & Becker, 1984; Raingruber, 2017). Perceived barriers are any negative consequences related to taking action, such as high cost, side effects and time requirements (Janz & Becker, 1984). Self-efficacy assesses the individual's capability to adopt and perform a behavior (Rosenstock et al., 1988). Cues to action are internal and external motivators that encourage health-seeking behaviors such as social desirability and acceptance and learning new information about a condition (Rosenstock, et al., 1988). The HBM posits that the individuals' beliefs about contracting or the prognosis of an illness prevent or motivate them to take action.

The HBM has been used to assess perceptions, beliefs and attitudes for many different health-related outcomes, including HIV prevention behavior, usually concerned with consistent and proper condom use, reducing sexual partners, reducing injection drug use and increasing HIV testing since these were the major mechanisms of prevention. One study that applied the HBM found that individuals with high perceptions of susceptibility to HIV infection, high self-efficacy and low barriers to using condoms were more likely to use them (Adih & Alexander, 1999). The susceptibility and belief components had strong correlations to the outcome, with Cronbach's alphas of 0.65 and 0.87, respectively. However, support from friends and sexual partners was also an important factor in increasing condom use among the participants, Ghanaian young men. In contrast, another study that used the HBM constructs for HIV prevention found that Asian American young adults did not feel susceptible to HIV because they perceived it as a "non-Asian epidemic." Perception of the severity of HIV infection and barriers to preventive methods influenced their actions of limiting the number of sexual partners (Yep, 1993).

The HBM has generally been accepted as a reliable framework for capturing people's perception of risk of contracting a disease and assessing their attitude. However, its use for assessing perceptions of risk with biomedical prevention methods, that is, HIV ART as prevention, is few to none, and it has not been tested with the concept of U=U. This concept of TasP has largely been studied only with the PLHIV and sexual minorities (Couffignal et al., 2020; Kalichman et al.,2007; Newcomb & Rendina, 2020; Teran et al., 2020). Few studies used the HBM to assess PrEP as biomedical prevention among HIV-negative populations (Garcia et al., 2016) and others compared it to traditional prevention methods (Warren et al., 2018). Like many of these studies, the U=U studies that investigated social determinants of health (SDH) have not documented any theoretical frameworks to guide their development.

Theory of Reasoned Action (TRA)

Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) allows for the assessment of personal as well as attitudes toward others (Webel, 2015) in addition to behavioral intentions and subjective norms which influence behavior (Raingruber, 2017). The attitude component was used as an outcome measure for assessing people's attitudes toward the U=U concept. The subjective norms were used to measure how they think others in society view this concept (Raingruber, 2017). The TRA has also been widely used to predict HIV prevention behaviors and to develop theory-driven HIV intervention programs (Peltzer & Oladimeji, 2004).

Syndemic Theory

The Syndemic Theory is an expansion of the SAVA (Substance abuse, violence and HIV/AIDS) theory proposed by Singer (1996). The latter showed the multiplicative effects of co-existing social factors such as SUD and violence, which synergistically work together to promote disease acceleration in those infected with HIV, resulting in quicker AIDS diagnosis (Singer, 1996; Singer & Clair, 2003). The Syndemic theory added SES and co-occurring mental health factors (Batchelder et al., 2015; Singer & Clair, 2003). Within the Syndemic theory, there are individual elements— low SES, mental illness, co-occurring mental health and SUD — and interpersonal violence that multiply HIV risk among minority women (Batchelder et al., 2015).

Socioecological Model (SEM)

The SEM was developed from Ecological Systems Theory which posits that the environments that individuals are exposed to daily, such as school, work, families and church, all work in combination to influence one's health (Raingruber, 2017). This relationship is also thought to be reciprocal, where the individual also has an effect on these environments. As such, the SEM is useful for evaluating risk and protective factors for health outcomes at multiple

levels, starting with the intrapersonal, interpersonal, institutional, community and policy levels (McLeroy et al., 1988). The SEM was conceived using theories of the behavioral-ecological model (Baltes, 1976) and ecology of human development (Bronfenbrenner, 1977). Unlike the HBM, which assesses health factors only at the individual level and promote the "victim blaming" ideology, developers of this model contended for consideration and evaluation of cultural, social and environmental factors that contribute to disease (McLeroy et al., 1988; Monge, 1978). Bronfenbrenner (1977) described different levels of systems that an individual interacts with and in on a daily basis: microsystems, meso *and* exo systems and macrosystems. This early model was modified to include the ontogenic development stage, child development, within the ecological model (Belsky, 1980). The current model that is often used in research and widely available was proposed by McLeroy, Bibeau, Steckler, & Glanz (1988). These levels that influence an individual's risk or protection from developing diseases or encourage or dissuade behaviors that promote health are: intrapersonal (individual), interpersonal, institutional (organizational), community and public policy (Golden & Earp, 2012; McLeroy et al., 1988).

The Intrapersonal factors include elements such as knowledge, attitudes, behavior, personality, biological and mental predispositions (McLeroy et al., 1988; Raingruber, 2017). The interpersonal level includes family, friends, work relationships and other social support networks (McLeroy et al., 1988; Raingruber, 2017). These first two levels are a part of the microsystems. The mesosystem involves the organizational or institutional influence with formal and informal operational rules and norms (McLeroy et al., 1988; Raingruber, 2017). The community level is an exosystem and includes factors such as norms, social and organizational affiliations and standards (McLeroy et al., 1988; Raingruber, 2017). The macrolevel includes the public policy level, which includes policies and laws that are formed at the local, state and

national levels (McLeroy et al., 1988). These latter two systems affect individual behavior in a top-down direction, while the first three levels have bottom-up effects. Since SDH confirms that individuals' health is determined largely by a complex relationship between physical and social structures (Short & Mollborn, 2015), the SEM is the best framework for assessing these variables and their associations with perceptions of risk of HIV infection and acceptance of U=U (Attia, Egger, Mueller, Zwahlen, & Low, 2009).

Like the HBM, the SEM has not been used to assess relationships of attitudes to biomedical TasP or U=U, including risk of HIV in these contexts, but it has been used for other forms of HIV prevention studies. For example, a study on syndemic risk among women of low SES found that factors such as self-worth and IPV work synergistically to increase their risk of HIV infection (Batchelder et al., 2015). Condom use and safer sex were not social norms in a Black community which impacted HIV testing behavior such that participants felt the need to get tested after engaging in high risk sexual activity (Dyson, Mobley, Harris, & Randolph, 2018). In another study, structural characteristics of neighborhoods that classify them as disadvantaged (Latkin, German, Vlahov, & Galea, 2013) were found to be associated with high-risk sexual behaviors among young MSM (Bauermeister et al., 2015). However, neighborhood characteristics were found to be associated with higher rates of testing, unlike individual financial status, which showed a downward trend below the poverty line. Further social factors that impact HIV prevention efforts include homelessness and HIV-related stigma at the community level among injection drug users (Biello et al., 2018). Drug addiction, depression, stigma and mistrust in treatment options were important individual barriers in some studies (Biello et al., 2018; Messer et al., 2013). Understanding multilevel SDH and how they affect people's attitude toward U=U may be critical in addressing the sociocultural, environmental and

structural barriers that hinder achieving the target for PLHIV (Cohen et al., Carneiro, Westmoreland, Patel, & Grov; 2020). Attitude toward U=U was investigated using factors at the individual, interpersonal, and community levels.

Social determinants of health. Within the framework of the SEM lies the SDH. SDH is defined as " the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (USDHHS, n.d.). As seen from the attitude theory, our attitudes include our health beliefs which are shaped by our experiences. Therefore, our SDH impacts our experiences which in turn impacts our attitudes toward health behaviors and, ultimately, our health outcomes. Attitudes toward treatment and TasP (U=U) are shaped by SDH. According to Healthy People 2030, there are five broad categories of SDH, each having numerous subcategories and target goals. These include: Economic stability, which includes goals to reduce poverty and unemployment; education access and quality seeking to increase the number of graduates from college; healthcare access and quality with the objective of reducing the number of new HIV infections, increasing knowledge of HIV status, linkage to HIV medical care, viral suppression as part of the sexually transmitted disease subcategory; neighborhood and built environment with the main goals to reduce the rate of minors and young adults committing violent crimes, increase the proportion of schools with policies and practices that promote health and safety; and social and community context seeking to increase the proportion of adults who talk to friends and family about their health and increase the health literacy of the population (U.S. Department of Health and Human Services, [USDHHS], n.d.). Undoubtedly, these social determinants play a significant role in influencing the risk factors that account for the great disparities that are seen among minority women and HIV risk and prevalence. In addition, race and SES have been major

determinants of disparities in health in the U.S. (Gornick & Swift, 2002). At least two of the SDH in regards to HIV risk, prevention and treatment were addressed through disseminating knowledge of the benefits of viral suppression among a high-risk group and improvement in health literacy regarding HIV treatment and outcomes and contributing to the normalization of HIV to allow for more open discussions with friends and family, especially given the high risk of HIV that is prevalent among minority women. Exploration of attitudes and the analysis of the SDH using the SEM as a framework of HIV risk and prevention, along with guiding theories of attitude, syndemics, HBM and TRA/TPB helped to identify the key constructs that contribute to positive and negative attitudes toward U=U.

Rationale for guiding theories

Having a theoretical framework is important to ensure that the research question is relevant and is assessing indicators that theoretically influence the particular health problem, in this case, the U=U concept (Kohler, Grimley, & Reynolds, 1999). "A theory attempts to explain why things work the way they do, … by way of identifying and examining relationships among things." (Ravitch & Riggan, 2017 p. 22).

The HBM and SEM both have predictive, intervention and evaluation properties making them excellent frameworks for guiding research from the inquiry phase to the program evaluation phase (Kohler et al., 1999). The constructs of the HBM and the model as a whole are well established through numerous studies that assessed their effectiveness at predicting health behavior (Janz & Becker, 1984). Individual components have been used and empirically validated, with each component's effect size ranging between 0.1 to 9% for various health outcomes in both sick and healthy populations (Harrison, Mullen, & Green, 1992; Kohler et al., 1999). These evidences support the use of the perceived susceptibility and perceived benefits

components to be used individually in my study. The perceived susceptibility construct was used to assess people's perception of risk of getting HIV in the context of U=U, which was an outcome measure. The perception of risk was assessed using a single Likert type question in the context of having sexual contact with someone who is HIV -positive but having an undetectable HIV viral load (personal risk). Perception of increased RSB among PLHIV (risk in others) as a result of changes in beliefs about treatment efficacy, U=U, was also assessed using multiple Likert type questions for different types of risk behaviors (Kalichman et al., 2007). The perceived benefits, i.e., efficacy, of U=U treatment was also assessed using a single Likert type question in this model (Couffignal et al., 2020; Kalichman et al., 2006).

The Syndemic Theory has been used in a few studies as a guiding framework to study HIV risk within the Syndemic Model. The additive effects of IPV, SUD and co-morbidities of mental disorders along with low SES on HIV risk (Batchelder et al., 2015; Singer, 1996; Singer & Clair, 2003) has been shown among South African (Pitpitan et al., 2013), Black (Koblin et al., 2015) and Hispanic women in the U.S. (Gonzalez-Guarda, Vasquez, Urrutia, Villarruel, & Peragallo, 2011). The model of syndemic risk factors explained 30% of the variance in RSBs in South African women (Pitpitan et al., 2013), where the researchers found that the prevalence of RSBs increased with increases in the number of existing psychological problems with a difference of almost 50% between those with no problems and those with all 7 problems (Pitpitan et al., 2013). Among Black urban women in the U.S., a higher syndemic score — derived from a sum of results of low income, housing instability, low education, lack of health insurance, SUD, alcohol use disorder, IPV, and incarceration — resulted in greater odds of engaging in RSBs after controlling for other demographic variables (Koblin et al., 2015). Among Hispanic/Latinas in South Florida, the syndemic factor was associated linearly with the

length of time in the U.S. and inversely with education level, and they accounted for 9.4% of the variation in the syndemic factor (Gonzalez-Guarda, McCabe, et al., 2011). Moreover, Hispanics have unique syndemic factors, such as language barriers and acculturation, that must be considered (González-Guarda et al., 2011).

Although more studies are needed to refine the definition and operationalization of syndemic variables in order to better understand the complex interactions and identify the health care interventions that can best address these multifaceted HIV risks among minority populations (Meyer, Springer, & Altice, 2011), the syndemic theory has been established as a model for predicting HIV risk behaviors among minority women. However, in this study, the syndemic theory/model was utilized as a framework for identifying women at risk for HIV instead of assessing risk variables with attitude outcomes. The main characteristics that were used to identify women at risk using this theory were: IPV, SUD and mental disorders. IPV was assessed using the Universal Violence Prevention Screening tool (Heron, Thompson, Jackson, & Kaslow, 2003), SUD was evaluated along with RSBs using the HIV Risk-Taking Behavior Scale (Darke, Hall, Heather, Ward, & Wodak, 1991) and mental disorders were assessed using the brief PHQ-4 instrument (Kroenke, Spitzer, Williams, & Löwe, 2009). Women who meet the criteria for experiencing any of these three risk factors based on cutoff points, respective to each scale, were classified as being at risk for HIV in this study. In addition, these individual and interpersonal factors were also used to determine their relationship with attitudes toward U=U at different levels within the SEM.

The SEM is also another model that has been validated as a good framework for testing factors across multiple levels to explain health outcomes in different types of study designs. The SEM is the best model for studying SDH because it allows for a holistic point of view and the

development of multifaceted interventions (Short & Mollborn, 2015). The SEM provided a framework for social determinants at the individual, interpersonal, organization, and community levels (See Appendix B for variables at each level). There were multiple questions with binary and Likert-type structures for each level. These factors were evaluated for relationships to the outcome variable, which is perceptions of HIV risk (personal), using Chi-Square test and multiple logistic regression or ordinal logistic regression. Another outcome variable is attitudes toward/acceptance of U=U; ecological variables were also tested for associations with this outcome using Chi-Square test and multiple logistic regression. The factors at each level are theoretically grounded and are important in a predominantly Hispanic population, a minority group with HIV health disparity, because they shape the risk of HIV and health outcomes. Social factors must be considered with TasP models because treatment alone is not going to produce the desired targets for prevention, transmission and continuum of care (Cohen, et al., 2020). This population is a fitting sample for testing these outcomes as it relates to U=U.

Adaptation of guiding theories

Only certain constructs within each theory were used to inform the theoretical framework guiding this study. The vast elements in one's experience that can impact attitudes according to the attitude formation theory are overwhelming for the scope of this study. Therefore, factors affecting attitudes in the study are limited to those in HIV risk and prevention and the U=U literature. The perception of severity and barrier components of the HBM were not used in this study. However, the susceptibility and benefits constructs were used as part of the attitude variable. Portions of the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) were also used to show how social norms impact attitude; this tool also allows for the assessment of attitudes toward others (Webel, 2015) in addition to behavioral intentions and subjective norms

(Raingruber, 2017). The TRA was used mostly to show the health-related significance of studying attitude due to the effect that it has on engaging in health-related behaviors. It was not used to predict behavioral intentions or engagement in a particular health-related behavior, although it has also been widely used to predict HIV prevention behaviors and to develop theory-driven HIV intervention programs (Peltzer & Oladimeji, 2004). The subjective norms in the TRA can also be used to measure how people think others in society view this concept (Raingruber, 2017). Likewise, the Syndemic model only used three factors out of many to evaluate and identify women at risk for HIV; these include IPV, SUD and metal health disorders. The SEM was also not used in full since policy-level factors were not evaluated.

Evidence-based theories - evaluation

HBM

All three theories, HBM, SEM and TRA, are evidenced-based constructs that have been used in many different types of study designs investigating different types of health-related outcomes for prevention, intervention and clinical experiences. Some of the early studies using and validating the HBM assessed perceptions and health beliefs about influenza and getting an influenza vaccine (Cummings et al., 1978; Janz & Becker, 1984). A critical review of 29 of these early studies provided empirical evidence for the structure of the model in predicting behaviors according to the beliefs of individuals (Janz & Becker, 1984). In this review, the perceived susceptibility domain was associated stronger with preventative behaviors, while the perceived severity was associated with behaviors during a disease course (sick role behaviors). One of these studies found that the HBM accounted for 34% of the variance in senior citizens (65 years and older) who obtained the flu vaccine (G. R. Thomas & John, 1979) in which the perceived susceptibility (0.31) and beliefs about the danger of the vaccine (-0.30) were

associated with getting a flu vaccine. Similarly, another study revealed construct validity of the HBM showing high convergence and discriminatory validity using 85 graduate students in assessing the domains of the model in addition to locus of control in health matters and interest in health matters (Cummings et al., 1978). In that study, a multitrait-multimethod approach and structural equation modeling analysis were used. Sixty percent of the variance was accounted for by the HBM components using a Likert type or multiple-choice scale, whereas vignettes had a lower effect with only 9%. Both of these studies, however, found collinearity between the domains. For example, perceived susceptibility and perceived severity had a moderate correlation of 0.313 (Cummings et al., 1978).

One of the early studies with HIV that used the HBM to assess risk behaviors found that constructs of the model, which included the self-efficacy and social norms dimensions as well, accounted for 28% of the variance among 452 incarcerated youth in their intentions to practice safer sex (Lux & Petosa, 1994). Sixty-eight percent of the youths in this study indicated that they would use condoms and according to the model, perceived susceptibility accounted for 1.7% of the variance, while social norms accounted for the highest proportion (12%) of the variance in hierarchical analysis, followed by barriers to use condoms and monogamy with 6.9% and male gender with 3.5%. Another study with Predominantly Black college students found that the HBM constructs in their original form accounted for 5% of their predication to use condoms which were increased to 9% once the full model was applied with self-efficacy and cues to action and locust of control (Winfield & Whaley, 2002). A cross-sectional study with Hispanic women found that a model containing HBM indicators, among others, accounted for 17.3% of the variation in their perception of susceptibility to acquiring HIV in which 88.5% of the participants did not feel susceptible to HIV (Cianelli, Villegas, Gonzalez-Guarda, Kaelber, &

Peragallo, 2010). This study, however, like many, did not report individual components' effect size. The HBM model has also been used in qualitative studies as a guide to investigating health beliefs and perceptions about HIV in emerging African American adults (Edwards et al., 2017).

TRA

Many of the early studies that utilized the theory of reasoned action were concerned with commercial behaviors and marketing strategies, and these behaviors varied greatly in scope, with some being health-related such as smoking, using a condom and physical activity (Sheppard, Hartwick, & Warshaw, 1988). Studies related to HIV prevention provide evidence for the use of the model to behaviors that are mediated by behavioral intentions, which are, in turn, affected by attitudes and social norms (Koniak-Griffin & Stein, 2006; Sneed & Morisky, 1998). However, one of the studies also supported the use of the attitude component (belief in a behavior) of the TRA independently to predict condom use and the number of sexual partners (Koniak-Griffin & Stein, 2006). The hedonistic beliefs ($\alpha = .76, .81$) and protective beliefs ($\alpha = .73, .71$), pretest and 3-month follow-up scores were strongly correlated with a combined outcome variable of condom use and reduction of sex partners. In another study, the attitude component of the TRA explained 17.5% of the variance in intention to use condoms in a study with 176 college students (Alexandra Isabel Cabral da Silva & Maria Cristina Salgado, 2018). This contribution was increased to 19.2% when the extended TRA (Theory of Planned Behavior; TPB) was used. In another study with 486 heterosexual men, the TRA was found to be a good fit model for determining monogamy and condom use under three different conditions (Beadnell et al., 2008). These studies show that TRA is also an evidenced-based construct that can be used to assess people's attitudes toward health-related outcomes.

Syndemic Theory

The Syndemic Theory has been used in a few studies as a guiding framework to study HIV risk within the Syndemic Model. Studies so far have shown an additive effect on HIV risk among women in South Africa (Pitpitan et al., 2013). The study, which was done among 560 women from Cape Town, found high levels of depression, with almost three-quarters screening as positive, one in five having PTSD, a little more than one-third reporting lifetime drug use and the majority (83.8%) with alcohol use problems (Pitpitan et al., 2013). In addition, HIV and STIs were prevalent, with 10.4% and 15.9% affirming a diagnosis in their lifetime. More alarming is that 18 out of 21 factors resulted in increased odds and positive associations, and a high degree of clustering of psychosocial ailments was found (Pitpitan et al., 2013). The authors found greater than fourfold increases, which were statistically significant, of having depressive symptoms and PTSD among those with increased food insufficiency (Pitpitan et al., 2013). In regard to HIV sexual risk behaviors, they found that the odds of having a co-occurring psychological problem increased for all including: a significant two-fold risk of being depressed, experiencing PTSD symptoms, alcohol use problems and childhood abuse; 69% more IPV, 88% more food insufficiency, and 92% more drugs use all of which were statistically significant (Pitpitan et al., 2013). Moreover, the prevalence of RSB increased with an increase in the number of existing psychological problems, with a difference of almost 50% between those with no problems and those with all 7 problems (Pitpitan et al., 2013). The model of syndemic risk factors explained 30% of the variance in sexual risk behaviors in this population of vulnerable women (Pitpitan et al., 2013). Another study with 799 women from urban areas on the East side of the U.S., majority Black, found that the higher the syndemic score, the greater the odds of engaging in sexual risk behaviors after controlling for other demographic variables (Koblin et al., 2015). This study, however, did not report the variance explained by the model.

Similarly, among 548 Hispanic/Latinas in South Florida, who were a part of an HIV prevention RCT called SEPA (Salud, Educación, Prevención y Autocuidado [Health, Education, Prevention & Self-care]), a syndemic factor which included SUD, violence, HIV risk, and depressive symptoms confirmed a good fit model for Hispanics, $\chi 2(27) = 53.26$, $p < .01$ (relative $\chi 2 = 1.97$, comparative fit index = .91, root mean square error of approximation = .04) using structural equation modeling (Gonzalez-Guarda, McCabe, et al., 2011). The syndemic factor was found to be associated with low education and length of time in the U.S. — studies have shown that the longer time in the U.S. or increase in acculturation among Hispanics is associated with poorer health outcomes, including an increase in HIV risk; the result confirmed the linear relationship between the length of time in the U.S. and syndemic factor association and the inverse relationship with education level, together the two variables accounted for 9.4% of the variation in the syndemic factor (Gonzalez-Guarda, McCabe, et al., 2011). However, other established factors, such as poverty and unemployment, as well as condom use, were not related to the syndemic factor in this study.

A review of the literature showed that among Hispanics, individual, cultural, relationship, and socioenvironmental factors work together to increase risk, and it includes ethnic-specific elements such as language and acculturation, which affects Hispanic populations in unique ways and which may not be contributing factors among other groups (González-Guarda et al., 2011). The review extensively showed how HIV risk is related to each of the syndemic factors, but the evidence was largely cross-sectional studies that utilized different combinations of the syndemic factors but did not use the model to evaluate its predictive nature for multiplied risk (González-Guarda et al., 2011). Although the model has also been used to explain HIV risk among Hispanic and Black MSM (González-Guarda, McCabe, Leblanc, De Santis, & Provencio-

Vasquez, 2016), further studies are needed to refine the definition and operationalization of syndemic variables in order to better understand the complex interactions and identify the health care interventions that can best address these multifaceted HIV risks among minority populations (Meyer et al., 2011). Nonetheless, the syndemic theory has been established as a model for predicting HIV risk behaviors among minority women.

SEM

The SEM, like the HBM, has been used for a wide variety of health-related issues. McLeroy et al. (1988) proposed using the model to identify drug and teenage pregnancy prevention strategies, such as changing norms, altering accessibility to influential deviant peers, creating alternative peer groups and reducing social desirability of influential groups. A later study used the SEM to investigate the determinants of the uptake of H1N1 influenza vaccine during the 2009 pandemic among a sample of 2079 adults, with an overrepresentation of Hispanics and African Americans (Supriya et al., 2012). The study found that 65% of the variance was explained by the combined factors at each level of the SEM. In addition, each level was statistically significant to the outcome accounting for large variances: intrapersonal level = 53%, interpersonal = 47%, institutional = 34%, and policy = 8% and community = 8% in this study. These results highlight the value of the SEM to gain insight into determinants of health and intervention targets simultaneously across multiple levels to address health problems.

The SEM was also used to assess HIV risk in the context of structural barriers, such as access to condoms for female sex workers who worked in bar settings versus those who were in the streets in Mexico (Larios et al., 2009). Women who worked in bars were more likely to get their condoms there and those who worked on the streets obtained theirs from mobile vans. The bar sample subsequently had less unprotected sex than the street workers. Final path analysis for

the bar workers showed that self-efficacy and access to condoms were associated with lower levels of unprotected sex; however, alcohol use reduced self-efficacy. Among the street workers, self-efficacy, but not access to condoms, reduced unprotected sex; drug use was associated with lower levels of self-efficacy in this group. The final models showed years in sex work and incentives for unprotected sex among bar sample (χ^2= 8.70 ns, (df=5), CFI=0.897, RMSEA=0.06) and increased incentives for unprotected sex (χ^2 =6.03 ns (df=3), CFI=0.827, RMSEA=0.07) among the street sample was associated with increased unprotected sex. Although the street workers had access to condoms, this had no effect on their self-efficacy to use them. Drug and alcohol use, along with institutional, environmental and social structures such as poverty, also influenced these women's HIV risk. These results highlight the complex nature of interacting variables at each level which can only be captured using the SEM.

Another study that used the SEM was about repeated adolescent pregnancies among Black and Mexican-Americans. The results showed that: smoking cigarettes within three months of birth and planning to give birth within five years at the individual level; having a partner more than three years older and being hit by them within three months of giving birth, and having low family support at the interpersonal level; not being enrolled in school at the community; and poor economic resources at the policy level were all associated with repeat pregnancies at 24 months compared to those who did not (Raneri & Wiemann, 2007). In this study, lack of contraception within the first three months of birth, categorized as an individual factor, was the strongest predictor of repeat pregnancies. The authors subsequently made intervention recommendations for each level targeting the risk factors found through this ecological approach. This study and the one above did not report variances in the individual components of the model. However, the results show the validity of the model in predicting health-related outcomes. Similar to the

HBM, the SEM has also been used in qualitative approaches to capture people's perception of barriers and facilitators to HIV-related stigma, prevention, treatment and care (Fletcher et al., 2016; Moucheraud et al., 2019; Wanyenze et al., 2017). A review of studies that employed the ecological model found that although may studies used this model as a framework, most interventions were still targeted at the intrapersonal and interpersonal levels and called for inclusion of the other domains to have better health impacts (Golden & Earp, 2012). These studies and many more act as empirical evidence that the SEM is a valid framework for assessing the multidimensional factors that intersect and work together to determine health (Short & Mollborn, 2015). Appendix C shows the theories and models and their utilization within the theoretical framework of the study.

Purpose of the study

Thus, the purpose of this study was to explore the awareness of and attitudes toward U=U and to assess the relationship of social-ecological factors, using the framework of the SEM, with attitudes including beliefs about the accuracy of U=U and sexual behavior and perceptions of risk of HIV infection in the context of U=U among minority women at risk for HIV in the El Paso, TX, US - Juarez, Mexico border region.

Definition of measures of interest

Attitude – "[countable] attitude (to/toward somebody/something) the way that you think and feel about someone or something; the way that you behave toward someone or something that shows how you think and feel." (Oxford University Press, 2021).

HIV risk – women who: have more than one sexual partner or engage in unprotected sex or get paid or pay for sex or have sex under the influence of a substance or have sex with someone high on a substance, or have sex with someone who is HIV positive, or have a SUD including

injection drug use (IDU), or have a diagnosed mental health disorder, and/or have experienced IPV (Batchelder et al., 2015).

Ethic/Racial minority women – Hispanic, Black, Native American Indian, Asian and Pacific Islander and other racial/ethnic minority women over the age of 18 years.

Social determinants of health – "are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (USDHHS, n.d.).

Socioecological factors – " one of the elements contributing to a particular result or situation" (Dictionary.com, 2021) at the individual, relationship, community, and societal level that interact in a complex way to impact health promotion and disease prevention outcomes (CDC, 2021).

Research questions

The research questions that this study was seeking to answer are: a) Are racial/ethnic minority women in the El Paso, TX, US - Juarez, Mexico border region who are at risk for HIV aware of U=U? b) What are the attitudes of racial/ethnic minority women at risk for HIV toward the concept of U=U? c) What are the social-ecological factors that are associated with these attitudes? The aims and hypotheses were as follows:

Specific Aims

1. **To identify minority women's awareness and attitude toward undetectable equals untransmittable (U=U).** Exploring and identifying attitudes to U=U within the social-ecological framework provided a rich insight into how women think and feel about U=U in relation to individual and sociocultural factors, adding to the scant body of literature about attitudes and U=U among this population. Using a semi-structured interview allowed for in-depth beliefs to be captured, adding to the richness of the data.

2. **To assess the proportion of at-risk minority women who are aware of U=U.**

   Awareness is important for health literacy and engagement in health promotion and disease prevention activities.

   Hypothesis- The level of awareness of U=U will be low among at-risk minority women (Carneiro et al., 2020).

3. **To assess the relationship of social-ecological factors (individual, interpersonal, organizational and community) with attitudes and beliefs toward the U=U message among minority women.** Understanding how factors at all levels within the SEM, including social determinants of health, impact minority women's attitude to U=U is critical to addressing the factors that lead to poorer treatment and health outcomes.

   Hypotheses – 1) Factors at all levels of the SEM will associate with the attitude outcomes. 2) Community-level factors will have a stronger association with attitudes toward the accuracy of U=U (Bazzi, Yotebieng, Agot, Rota, & Syvertsen, 2018; Misener & Sowell, 1998). 3) Individual factors will have a stronger association with sexual behavior and perceptions of HIV risk in the context of U=U (Rendina & Parsons, 2018).

4. **To compare and contrast qualitative themes and quantitative findings of awareness and attitudes toward U=U among minority women.**

   In mixed-methods studies, a hypothesis is not tested for the triangulated data; a research question is addressed instead (Creswell & Clark, 2007). Triangulation of different types of data is one way to ensure validity in qualitative inquiry in addition to researcher reflexivity (Creswell & Miller, 2000). It is expected that the themes from the interview data will reflect the results of the survey data in regard to attitudes toward U = U.

Significance of the problem

Trends among minorities have not changed in terms of new HIV diagnoses. Blacks/African Americans continue to be disproportionately affected by new HIV infections and AIDS-related deaths (Avert, 2019; CDC, 2020a; CDC, 2018; KFF, 2020a). Black and Hispanic women in America have consistently experienced poorer health outcomes with higher rates of advanced disease stage of AIDS at diagnosis, higher rates of late diagnosis and higher death rates since the early 1980s (CDC, 2020a; CDC, 2018; KFF, 2020a). Racial inequalities and economic disadvantage are at the heart of the epidemic in the U.S. (Pellowski, Kalichman, Matthews, & Adler, 2013). Pervasive distrust of HCP and perception of stigma continue to contribute to Black women's negative attitudes toward treatment even in the era of HAART (Schrimshaw et al., 2005), and studies suggest that Hispanic/Latina women continue to have poor knowledge about HIV prevention and treatment. These factors have not been explored among minority women with regard to U=U. This study can further contribute to the literature on U=U in unveiling whether lack of awareness and negative beliefs toward treatment persist among minority women and determine the factors associated with them in the U=U era.

Furthermore, women's health and HIV are of particular importance because of the impact that it has on sexual and reproductive health and the possibility of mother-to-child transmission. Women with HIV are five times more likely to develop cervical cancer than women without HIV but are less likely to be screened, which puts them at a critical disadvantage in being diagnosed with advanced disease (Andrasik, Rose, Pereira, & Antoni, 2008; Baranoski, Horsburgh, Cupples, Aschengrau, & Stier, 2011). The effectiveness against HIV transmission through U=U (Attia et al., 2009) could have a tremendous impact on women's reproductive and sexual health and HIV prevention at several ecological levels. It can also shape attitudes to produce more

favorable health outcomes, given the high risk that exists among this population. Attitudes toward U=U have been important among other at-risk groups such as SMM (Carneiro et al.) and similar groups (Rendina et al., 2020). Also highlighting the significance of U=U is a campaign that was started several years ago to promote the message (Simek, 2017). At a broader scale of significance, the study increased awareness of the U=U concept and may help to breakdown the psychological barriers related to stigma among PLHIV and women who are at risk (Thomford et al., 2020).

Furthermore, a national priority in HIV prevention included reducing the disparities among minorities, especially Black women and those who live in the southern states (White House Office of National AIDS Policy, 2015). Two of the national Healthy People 2030 goals directly relate to the significance of this study. The first goal of increasing healthcare access and quality with the objective of reducing the number of new HIV infections, increasing knowledge of HIV status, linkage to HIV medical care, and viral suppression, as part of the sexually transmitted disease subcategory, were addressed by raising awareness of TasP through the concept of U=U in the study which could lead to increased medication adherence and viral suppression among this high-risk group and the people whom they share the knowledge with. Second, objectives in the social and community context seeking to increase the proportion of adults who talk to friends and family about their health and increase the health literacy of the population (USDHHS, n.d.) was covered since one of the benefits that drive the campaign of U=U is the potential to break down stigma toward PLHIV, thus improving health-seeking behaviors at all levels of the HIV care continuum with HIV status disclosure being a critical component (Okoli et al., 2020).

In summary, the findings from this study could be used as a resource to develop a targeted intervention that alters/removes attitudinal barriers and encourages health promotion and disease prevention behaviors such as HIV testing, linkage to care, retention in care, increased viral suppression and ultimately better health outcomes among this vulnerable group. The U=U concept underscores the value of increasing viral suppression among PLHIV. Increasing the awareness and understanding of the benefits of an undetected viral load can also help to decrease stigma around HIV, especially among at-risk populations, which can also lead to better health outcomes.

Assumptions

Women, overall, are underrepresented in studies about TasP of HIV and U=U. Minority women should have equal opportunity to voice their perspectives on U=U since they are at increased risk of acquiring HIV through heterosexual contact, have a great burden of HIV, and have the poorest health outcomes among women with HIV; factors that are of equal importance to the risks and health challenges faced by MSM. The importance of HIV prevention through U=U is especially underscored in the context of childbearing for women. Women at risk for HIV are intellectually capable of making meaningful contributions regarding the complex subject of HIV treatment and the concept of U=U. Women would have impactful insight into U=U because of its implications for sexual and reproductive health. Useful information would be provided that can be used to develop interventions to target unfavorable attitudes and lead to changes in attitude and subsequent behavior at the individual level. Social factors can be identified and altered to improve attitudes and subsequent behaviors at the individual and community level. Attitude impacts behaviors and visa vera. A rich contribution that adds to the diverse body of knowledge about attitudes toward and determinants of U=U from women's

perspective would be the end result. The research process and findings would help to promote the message of U=U and contribute to the normalization of HIV and reduction of stigma toward PLHIV, which may ultimately positively impact health-seeking and HIV prevention behaviors among women at risk.

CHAPTER II – LITERATURE REVIEW

HIV/AIDS Among Women Globally

An estimated 38 million people around the world were living with HIV/AIDS in 2019, and of these, approximately 1.8 million were children under 15 years old (UNAIDS, 2020b). Approximately 1.7 million new infections and 770,000 HIV/AIDS deaths occurred in 2018 (UNAIDS, 2019). Globally women and girls continue to be vulnerable across regions and they account for 48% of all infections and as high as 59% in Sub-Saharan Africa, where the main mode of transmission is heterosexual (UNAIDS, 2020a; UNAIDS, 2020b). In the Caribbean, a region with the second highest rate of HIV/AIDS outside of continental Africa, women accounted for 52% of the PLHIV in 2015, with Bahamian and Haitian women having prevalence rates that exceeded men at 2.3% and 2.1%, respectively% (Pan Caribbean Partnership Against HIV/AIDS, [PANCAP], 2017). Weekly, approximately 6,000 women and girls 15-24 years old become infected with HIV (UNAIDS, 2019), and the mortality rate due to this infectious disease has tripled in young people from 2000 to 2015 (United Nations International Children's Emergency Fund, [UNICEF], 2015). Adolescents and young adults accounted for approximately 2.1 million HIV cases worldwide in 2016, and 37% of all new infections in 2017 were among 15-24-year-old individuals (Avert, 2018b), which is projected to increase by 13% annually, equating to 3.5 million by 2030 (UNICEF, 2017). It is estimated that approximately one out of four new infections among 15-24 year old were among girls in 2019 in sub-Saharan Africa, a region where women and girls have twice the number of infections than men (UNAIDS, 2020a). However, deaths among women worldwide due to HIV/AIDS have reduced by 46%, a greater reduction than in men (32%), since 2010; however, in the Sub-Saharan African region, the numbers remain similar at 220,000 deaths for both genders (UNAIDS, 2020a). Despite declines

in new HIV infections and deaths among women, HIV remains a leading cause of death for women of childbearing age and the top five cause of death for adolescent girls between the ages of 10 and 14 years old globally (UNAIDS, 2018). Structural inequalities, including gender inequities, violence and discrimination, continue to be a global driver of HIV risk and poor treatment and health outcomes among women (Amin, 2015).

HIV/AIDS in the U.S.

In the United States (U.S.), the HIV epidemic has been largely characterized by racial and socioeconomic differences. In 2019 minority groups — Black/African Americans (42% or 476,100) followed by Hispanics (19% or 254,600) — were the major groups living with HIV (KFF, 2020a; KFF, 2014) of the 1.2 million PLHIV in the U.S. (HIV.gov, 2020). Hispanics accounted for 27% of new HIV infections in 2018 (Avert, 2019; CDC, 2019; CDC, 2020b). Although the incidence of HIV has been reduced by two-thirds since the start of the pandemic in the U.S., it has plateaued since 2013 (CDC, 2019a; CDC, 2019). Even more disconcerting is the fact that the trends among minorities have not changed in terms of new diagnoses. Blacks/African Americans accounted for 43% in 2018, and deaths, 44% due to HIV/AIDS, despite only making up 13% of the population (Avert, 2019; CDC, 2020a; CDC, 2018; KFF, 2020a).

HIV/AIDS disparities in the U.S.

Health disparities occur in the context of social, economic, and/or environmental disadvantage (Office of Disease Prevention and Health Promotion, [ODPHP], 2020) due to inequalities which are structural injustices (Whitehead, 2007). Within the Social Model of Health (SMH), health determinants include race/ethnicity, gender, age, SES, physical environment, geography, cultural norms and policy (Dahlgren & Whitehead, 1991). Race,

unfortunately, is a predominant determinant of health and a disparity factor of HIV in the U.S. (Williams, 2012).

Disparities of HIV incidence and prevalence among minority groups are seen on a national, state and local level. Nationally, Blacks and Hispanics have the highest burden of HIV infection and related deaths — among the top five leading causes of death for both groups (Messer et al., 2013). Forty-three percent and 26% of new HIV infections were among Blacks and Hispanics, respectively, in 2017 (Avert, 2019). Nationally, Hispanics remain the second leading group living with HIV, with a quarter million people at the end of 2015, while Blacks lead with almost half a million PLHIV that same year (Avert, 2019).

In the State of Texas, which is among the top five states for new HIV infections (CDC, 2020), a similar trend is seen where Hispanics are second to Blacks for the proportion of people who are newly infected and living with HIV, one-fifth of which are women (TDSHS, 2019). The wide disparity is evident in the fact that the prevalence rate of HIV among Blacks is 3 to 13 times the rate of Hispanic and Whites at 1006.7 per 100,000 population versus 278.3 and 192.2, respectively (TDSHS, 2020c). In the West Texas HSDA, El Paso County had an increase in HIV infections rate from 2017 to 2018, surpassing the State rate of 15.7 at 16.3 per 100,000 persons (TDSHS, 2019) and is home to 99.5% of those infected in this HSDA (PanWest-West Texas Ryan White Programs [PWTRWP], 2013). El Paso county has been among the top 10 counties in Texas for HIV cases and among the top 20 for HIV case rates for a new diagnosis, AIDS diagnosis and PLHIV (Ovalle-Valdez, n.d.-b). Unlike the national and state trends, in this border region, Hispanics, who comprise 83% of the population, take the lead with new infections and the number of PLHIV among the 2,249 cases in 2018 (TDSHS, 2019).

In addition to disparities in HIV infection rates among Black and Hispanics, differences exist for outcomes in the care continuum as well, with only 61% of Blacks and 60 % of Latinos living with HIV receiving care in 2018, compared to 60% and 59% in 2015, respectively (CDC, 2019; CDC, 2016a; CDC, 2020; CDC, 2020a). While there are gains made in getting Black and Hispanics in care, their viral suppression rates are still much lower than that of Whites (CDC, 2018). Moreover, they are well below the 90-90-90 targets of the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the national goals for ending the HIV pandemic, which stipulates "90% of PLHIV know their HIV status; 90% of people who know their HIV-positive status on treatment; and 90% of people on treatment with suppressed viral loads" by 2020 (UNAIDS, 2014 p. 1; White House Office of National AIDS Policy, 2015). In 2018, 63%, 61% and 70% of Blacks, Hispanics and Whites, respectively, received care; 48%, 49% and 52% were retained in care, and 51%, 53% and 63% were virally suppressed, respectively (CDC, 2018). Although linkage to care was high (89%) between 2011 and 2013 in the El Paso HSDA, 30% of PLHIV, majority Black and Hispanic men, were out of care during the same time frame in the State (Vaaler et al., 2014). A dismal 34% was retained and only 25% of PLHIV reached viral suppression in a one-year follow-up in the State of Texas (Vaaler et al., 2014). Recent data for the state and the El Paso region indicate that about 30% of PLHV are not linked to care, more than one-third are not retained in care, and approximately 40% are not virally suppressed (Ovalle-Valdez, n.d.-a, n.d.-b; TDSHS, 2020c). Additionally, Hispanics had the highest percentage of AIDS diagnosis (35%) within one year of HIV diagnosis and Blacks had 26%, indicating late diagnosis, which a lack of insurance may be a contributing factor (TDSHS HIV/STD Program, 2016). However, Blacks still had the highest rate of HIV-related deaths in the state and in the U.S. despite findings that Hispanics progressed to clinical AIDS diagnosis at

a higher rate (Nduaguba, Ford, Wilson, & Lawson, 2018; TDSHS HIV/STD Program, 2016). These results indicate a continued disparity among minority groups for HIV continuum of care which requires further research and attention.

Poverty has been associated with the communities of color disproportionately affected by HIV in the U.S. In one study, 75% of people earned below poverty level income in urban areas (Denning & DiNenno, 2019). An analysis of 1748 late HIV diagnoses in New York found that neighborhoods with high income inequalities were 2 times more likely to have late HIV diagnosis; socioeconomic deprivation and Black race concentration in neighborhoods significantly contributed to late HIV diagnosis, while others have found associations with these factors for increased HIV diagnosis as well (Ransome, Kawachi, Braunstein, & Nash, 2016). Racial inequalities and economic disadvantage are at the heart of the epidemic in the U.S. (Pellowski et al., 2013).

HIV incidence, prevalence and risk among minority women in the U.S.

Approximately 23% of PLHIV were females in the U.S. in 2016 (CDC, 2019b), with a slight decline in 2018 at 22% (CDC, 2021). A similar proportion of women (20%) are living with HIV in Texas State (TDSHS, 2020c). Hispanic women are the second leading ethnic group among WLHIV in the nation and in the state of Texas (CDC, 2019, 2020). Hispanic women made up 18% of new HIV among women in the U.S. (CDC, 2020b) and 18% of new HIV infections among all Hispanics (men and women combined) in 2016 (CDC, 2019b). In Texas, they accounted for 24% of WLHIV and an estimated 31% of new HIV infections in 2018 (TDSHS, 2020b; TDSHS, 2020c). Black women, in particular, are disparately affected, having 58% of new cases nationally (KFF, 2020a) and 51% at the state level among all women in 2018 (TDSHS, 2020b; TDSHS, 2020c). They also make up 56% of WLHIV in Texas (TDSHS,

2020c), although Blacks are only about 13% of the State population. Over 50% of new HIV infections among women in 2018 were among those between the ages of 25-44 years old, prime child-bearing age nationally (CDC, 2020b) and in the Texas State (TDSHS, 2020b).

What is most concerning is that the trends in the number of new HIV cases and advanced disease stage at diagnosis among women have remained fairly constant, with slight decreases among Black and Hispanic women from 2010 - 2017; however Black women continue to be the most highly affected (CDC, 2018). The disparaging trends among Black women are also seen at the State level, where the rate of new HIV infections has reduced from 36.4 to 22.7 per 100,000 from 2009 to 2018; however, the difference between rates is wide with Hispanic women following at an approximate rate of 5 per 100,000 during that period, albeit it is closer to the rate among all women (5.7 per 100,000) in the State (TDSHS, 2020b). In El Paso County, where Hispanics are the leading ethnic group affected by HIV, women made up 9.7% of new HIV diagnoses in 2017, an increase from 8% in 2016 (Ovalle-Valdez, n.d.-a, n.d.-b). Unfortunately, despite sharing a high burden of the HIV epidemic in the nation and the state, women were generally not actively involved in HIV research, prompting a statement by top public health experts that gave a call to include women and girls in HIV clinical trials, and to empower them with new modes of HIV prevention that are controlled by females to reduce transmission (National Institutes of Health, [NIH], 2006).

Socioecological Factors that influence risk of HIV among minority women

Women's risk for HIV includes individual and interpersonal factors described by the SAVA (Substance abuse, violence and HIV/AIDS) theory proposed by Singer (1996) and the Syndemic theory (Batchelder et al., 2015; Singer & Clair, 2003) in addition to societal and structural factors. The SAVA theory highlights the multiplicative effects of co-existing SUD and

violence with co-morbid diseases that accelerate the progression to advanced HIV disease resulting in AIDS (Singer, 1996). The syndemic theory expanded upon the SAVA theory and included low SES, mental health disorders, co-occurring mental health and SUD among the individual factors that synergistically increase HIV risk among minority women (Batchelder et al., 2015). Furthermore, structural factors such as poverty and gender inequalities (Morales-Alemán et al., 2014), reinforced through social and cultural norms, and sexual abuse globally (Avert, 2018a; UNAIDS, 2020a) and in the U.S. continue to act as IV risk drivers among minority women (Wendlandt et al., 2016). Other structural and environmental factors that act as social determinants of HIV risk include geographical location, physical environment, social, and cultural environments (Dahlgren & Whitehead, 1991). Using the SEM of risk factors, the individual, interpersonal, community and social risk factors among minority women were explored further.

Individual factors. Research shows that among people with mental disorders, the prevalence of HIV is quadruple that of the general population (Blank et al., 2014). Depression and anxiety are well documented mental illnesses, along with SUD, that are directly related to an increased risk of HIV (González-Guarda et al., 2011; Gonzalez-Guarda, Vasquez, et al., 2011). Women are at a heightened risk of HIV vulnerability since they are disproportionally affected by mental illness compared to men (National Alliance on Mental Illness, 2019; National Institute of Mental Health, 2019). Research has shown associations between HIV risk behaviors and mental health problems in women, not seen in those who do not have a mental health problem (Costa et al., 2017; Meade & Sikkema, 2005a, 2005b; Weinhardt et al., 1998). Women with mental illness were also found to have a lower knowledge about HIV despite having higher perceptions of HIV risk (McCabe, Schaefer Solle, Peragallo Montano, & Mitrani, 2017). HIV risk behaviors such as

multiple sexual partners and trading sex for money are prevalent among people with mental illness (McKinnon et al., 1996) and particularly in urban settings (Brunette et al., 1999) similar to the El Paso, TX, US - Juarez, Mexico border region. Deficits in problem-solving skills, judgment and increased suicidal ideation are contributing factors to HIV risk behaviors among people with mental illness (Brown & Jemmott, 2000). HIV risk is also multiplied in those with mental illness since they are also known to have a high risk of SUD compared to those without a mental illness (American Addiction Centers, 2019). This is of importance since data show that mental illness and co-occurring SUD increased in the general population in 2019 (SAMHSA, 2020b) and among women, with an estimated 34.3 million women having a mental illness and 4.6 million having a co-occurring SUD and mental illness (SAMHSA, 2020a). The data also showed that over half of the people receiving mental health services in 2013 – 2018 were women (SAMHSA, 2020c). These pieces of evidence support the high susceptibility of minority women to acquire HIV, which could potentially result in the perpetuation of the current trends of HIV incidence, prevalence and deaths among this population.

Another critical individual factor that influences HIV risk is SUD. Data show that SUD has increased among women in the U.S. (SAMHSA, 2020a). People with SUD alone were found to be three times more likely to be infected with HIV, while those with co-occurring SUD and mental illness were 2 times more likely to be infected (Prince, Walkup, Akincigil, Amin, & Crystal, 2012). Early studies showed the association between high-risk sexual behaviors such as prostitution, promiscuity and homosexual activity with SUD, especially hard drugs such as heroin and cocaine, among women, with about a quarter of those who engaged in any risky behavior and almost half (48%) of those having extramarital relationships also reporting SUD (Cottler, Helzer, & Tipp, 1990). In a more recent study among 400 women with alcohol misuse,

the majority Black, found similar proportions of women reported any drug use (38.3%), sex for drugs or money (39.0%), while a quarter reported sex under the influence of alcohol (Lee et al., 2018). Drug use alone was found to be associated with condomless sex under the influence of alcohol (Prevalence ratio - PR, 2.0; 95% CI, 1.2–3.3) and transactional sex (PR, 2.3 (95% CI, 1.6–3.3) but not lifetime sexual partners (PR, 1.3; 95% CI, 1.0–1.7); the first two risk behaviors were also significantly associated with a combination of drug use, IPV and depressive symptoms although these associations were not found to synergistically drive risk behaviors among these participants (Lee et al., 2018). A qualitative study using a sample of 288 women, predominantly Black, who were apart of the HPTN 064 found that SUD was a major theme that shaped HIV risk among the participants (Frew et al., 2016). Approximately one-third of the women reported using illicit drugs, including crack, hallucinogens, ecstasy, marijuana as well as alcohol, of which the women revealed that their judgments to engage in safe sex, such as using a condom, was impaired under the influence of these substances (Frew et al., 2016). Moreover, non-injection drug use was also found to be associated with IPV among minority women (Morales-Alemán et al., 2014).

Interpersonal factors. Violence, especially in the form of IPV, is a significant driver of minority women's HIV risk in the U.S. (Gonzalez-Guarda, McCabe, Mathurin, DeBastiani, & Peragallo Montano, 2017; Meyer et al., 2011). Women who experience and are exposed to violence are at a 50% increased risk of HIV compared to those who do not have these experiences (UNAIDS, 2020a). One out of five women in the U.S. experience IPV and a quarter experience severe forms of abuse (CDC, 2019). Hispanic and Black women are at an elevated risk of HIV due to IPV (Batchelder et al., 2016; Cavanaugh et al., 2010; Sormanti, Wu, & El-Bassel, 2004) since higher rates of violence are found among these groups. A rate of 29.1% was found in a study

with predominantly Black and Hispanic women (Morales-Alemán et al., 2014). Furthermore, 39% of domestic violence cases in 2018 in Texas were among Hispanics and approximately three-quarters of victims were females regardless of ethnicity (Texas Department of Public Safety, [TDPS], 2018a). IPV is associated with sexual coercion (Josephs & Abel, 2009), leading to an increase in high-risk behaviors such as casual sex, multiple and concurrent sex partners and transactional sex (Draughon et al., 2015).

IPV also leads to the development of PTSD, which also is a predictor of unprotected sex with high-risk partners such as IDU and HIV seropositive partners (Cavanaugh et al., 2010). IPV produces a cycle of violence and risk for victims since it increases the prevalence of mental illness and PTSD (Golding), which in turn inadvertently increases susceptibility to high-risk behaviors (Cavanaugh et al., 2010). HIV sexual risk over the lifetime, such as transactional sex and multiple sexual partners, also results from abuse in childhood and adulthood (Aaron, Criniti, Bonacquisti, & Geller, 2013; Meade, Kershaw, Hansen, & Sikkema, 2009). Another co-occurring syndemic among people resulting from IPV due to PTSD is SUD. Minority women who had PTSD from exposure to IPV were found to be highly susceptible to developing SUD (Newcomb & Carmona, 2004). Unsurprisingly then, HIV risk among people with SUD (Weiss et al., 2013), depression (Marshall et al., 2013), serious mental illness (Rosenberg et al., 2001), and drug dependency (Narvaez et al., 2019) were associated with PTSD. Among Native American Women an association was found between heavy drinking and PTSD with increased risk behaviors such as unprotected sex and number of sexual partners (Pearson et al., 2015).

Following the trend of increased mental illness, SUD and co-occurring illnesses among women, domestic violence has also seen an increase in El Paso County. In 2018 5,036 reports of domestic violence were recorded in El Paso County, a slight increase from 5,295 in 2017 (TDPS,

2017; TDPS, 2018b). Four deaths due to domestic violence occurred in 2018 (Texas Council on Family Violence, 2019). Both incidences of domestic violence and death are thought to have increased during the pandemic (Draksler, 2020), putting minority women at increased risk of HIV. In addition to violence, other important drivers of HIV risk and disparities in this region include language barriers, poor access to healthcare, immigration status, stigma and discrimination (Avert, 2019; CDC, 2019; CDC, 2020a).

Community/neighborhood factors. Minorities in the El Paso, TX, US - Juarez, Mexico border region face environmental and structural drivers of HIV, including the geographical location, physical environment, social and cultural environments and poverty (Dahlgren & Whitehead, 1991). El Paso County has an estimated population of 850,000 residents (U.S. Census Bureau, 2019) and is classified as a major metropolitan city. However, approximately 25% of El Paso County's residents live below the poverty level, much higher than the state level (PWTRWP, 2013), and 1 out of 5 adults are uninsured (U.S. Census Bureau, 2019). Unemployment trends in this region are similar to the state and nation (U.S. Bureau of Labor Statistics, 2019). However, the region has the lowest median annual income compared to other HSDAs in Texas (PWTRWP, 2013).

Due to its proximity to its sister city, Ciudad Juarez, Mexico, El Paso City is at a geographic disadvantage for increased HIV risk and disparity. Ciudad Juarez has a thriving population of over 1.2 million residents (Verghese et al., 1995), and increased mobility between the two cities provides opportunities for increased infiltration of illegal drug activity and HIV risk. A quarter of El Paso County's population is born outside the U.S., the highest rate among HSDA in Texas (PWTRWP, 2013), and research has shown increased risks for and rate of HIV among immigrants (Prosser, Tang, & Hall, 2012; Valverde et al., 2015). High rates of violence,

unsafe injection drug use and elevated rates of HIV infection among high-risk populations are evident in Ciudad Juarez (Strathdee, Magis-Rodriguez, Mays, Jimenez, & Patterson, 2012) and put El Paso County at increased risk. Data show that crime rates increased by 0.1% and violent crimes by 0.5% from 2018 to 2019 in El Paso County, which consisted of 128,295 drug violation arrests (TDPS, 2019).

Furthermore, within the geopolitical context of the El Paso, TX, US - Juarez, Mexico border region, violence, gender norms and perceptions of stigma intersect and interplay with the availability of health services, policies and practices resulting in poor medication adherence for PLHIV in this region (Shedlin, Decena, & Beltran, 2013). Research as well as culturally sensitive interventions are lacking and are greatly needed among this population in the border region.

Social norms. Minority women are at increased risk through heterosexual activity stemming from cultural and social norms that prevent disclosure of sexual orientation, particularly among MSMs and other SMM (Ingoldsby, 1991). MSMs accounted for 67% of new HIV infections in 2018 in the U.S. (HIV.gov, 2020) and in El Paso County, they comprised over 70% of new infections in 2017 (Ovalle-Valdez, n.d.-b). Furthermore, new HIV diagnoses among Black and Hispanic women were transmitted through heterosexual activity in 92% and 88% of infections in 2018, respectively (CDC, 2018). While in El Paso County, approximately 17% of new infections in 2017 were attributed to heterosexual activity (Ovalle-Valdez, n.d.-b).

Furthermore, community stigma and discrimination are critical drivers of HIV risk and poor treatment outcomes for minority women. Stigma and discrimination are structural drivers that hinder HIV prevention and health-seeking behaviors across regions, with as much as 71% of people expressing such attitudes in undeveloped nations such as Jamaica (UNAIDS, Avert,

2018a; 2020a). In the U.S., the primary drivers of the HIV disparity among young adults are stigma and discrimination, compounded by similar attitudes toward those with sexually marginalized status, which predominates among young PLHIV (Avert, 2019).

HIV treatment and health outcomes among minority women

Treatment and health outcomes for people at risk for HIV and PLHIV are assessed along the HIV continuum of care which includes linkage to care, retention in care and viral suppression. HIV/AIDS-related morbidity and mortality outcomes are also used as indicators of health among PLHIV. Historically, females, minorities and uninsured PLHIV were more likely not linked to care, and it was estimated that one out of every three PLHIV in the U.S. was not receiving care (Mugavero et al., 2007). This trend continues with only 66 out of every 100 PLHIV receiving care, 49 per 100 retained in care and 53 per 100 achieving viral suppression (CDC, 2020b). Women had similar rates, with 66, 51 and 53 per 100 women receiving some care, retained and virally suppressed, respectively, in 2016 (CDC, 2020b). However, when compared to men in 2018, fewer women than men with HIV diagnosis were linked to care within one month and achieved viral suppression within six months of diagnosis, despite a similar proportion retained in care (CDC, 2018). Fewer female IDUs compared to male IDUs were linked to care, but more female IDUs reached viral suppression in that same year. Moreover, one study found gaps in the quality of care between genders where women were less likely to receive ART or PrEP despite having more regular visits in Ryan White CARE Act-funded clinics (Hirschhorn et al., 2006). Women in Texas overall showed good HIV care indicators in 2018, with 89% knowing their HIV status, 71% retained in care, and 84% virally suppressed among those retained in care (TDSHS, 2020b), closely approaching the 90% targets for two of the indicators.

Furthermore, Blacks had the lowest linkage to HIV care compared to all other racial groups and they also had the poorest viral suppression compared to Hispanics and Whites in the nation (CDC, 2018). Although increases in prescribed ART are evident for Blacks and women who are in clinical care, they continue to have lower viral suppression (Bradley et al., 2016). The data also show poorer outcomes for Black women in Texas, with only 77% receiving care, 69% retained in care, and 58% achieving viral suppression among those in care in 2018 (TDSHS, 2020a), despite having the majority of the cases and women overall having higher achievements. Research also shows that although Blacks only comprised 30% of the HIV testing population in Texas, they accounted for over half of the positive tests, a trend that was more striking for Black women, who only made up 16.8% of the testing volume but had 65.8% of positive tests among women (Mandy, Marylou, Samuel, Jeffrey, & Marlene, 2020), however only comprising about 12% of the Texas female population (TDSHS, 2020a). Although Hispanic and Blacks share the highest burden of HIV nationally (CDC, 2019), in the State and in El Paso County — 85% of the 2,249 PLHIV are Hispanic as of 2018 (TDSHS, New Solutions, 2013; 2019) — viral suppression is low among these minority groups (CDC, 2018; Vaaler et al., 2014). As mentioned before, improvements have been made and more recent data show that approximately 71% of PLHIV in El Paso County have received care, 66% were retained in care, and of those, 60% achieved viral suppression in 2017 (Ovalle-Valdez, n.d.-b), a slight decrease in all indicators from 2016 (Ovalle-Valdez, n.d.-a). The large proportion of minority women not retained in care and even higher amounts not achieving viral suppression has serious implications for their sexual and reproductive health. Highlighting this is the data showing that 14 PLHIV in El Paso County in 2017 were perinatally infected (Ovalle-Valdez, n.d.-b).

Disparities in receipt of HIV treatment, non-adherence to medication and lack of viral suppression continue to burden minority women. Black and Hispanic women were found to be less likely than White to use ART and about 30% of those eligible to receive ART did not in one study (Lillie-Blanton et al., 2010). Lack of health insurance and alcohol use were found to be related to the non-use of HAART across ethnicities (Lillie-Blanton et al., 2010). In another, Black women were more likely to be non-adherent (Geter, Sutton, Armon, & Buchacz, 2019). Among women in the 2010–2014 cycles of the Medical Monitoring Project, Black and Hispanic women were significantly less likely than White women to achieve and maintain viral suppression after adjusting for ART adherence, HIV disease stage, and socioeconomic factors such as age, homelessness, and education (Nwangwu-Ike, Frazier, Crepaz, Tie, & Sutton, 2018). Similarly, another study found that Black and Hispanic women were less likely to attain virologic suppression compared to White women (Geter, Sutton, Armon, et al., 2018). In addition, virologic or treatment failure with HAART was found to be higher among African American women compared to Hispanic and White women, and this was associated with having low income and symptoms of depression; the latter association was found only among Black women (McFall et al., 2013). However, low income and lack of insurance were correlated with virologic failure among Hispanic women (McFall et al., 2013). Given the trends in viral suppression among minority women, mother-to-child transmission (MTCT) is a major consideration for HIV prevention and health outcome indicator. Although perinatal transmission has evidently reduced tremendously from 2010 – 2016, decreasing from 1.8 to 1.1 per 100,000 live births for all women, the rate remains very high among Black/African American women at 6.8 to 5.0 (CDC, 2019c).

Delayed testing, disparities in linkage to treatment, poor retention in care and poor virologic treatment shed light on the fact that women in the U.S. accounted for 26% and Black/African Americans over 50% of the HIV-related deaths in both 2017 and 2018 nationally (CDC, n.d.; CDC, 2020). Black women had higher death rates (12.7 per 100,00) and accounted for 57.5% of all deaths among women in 2018, a trend that has remained constant since the early 1980s (CDC, 2020a; CDC, 2018; KFF, 2020a) despite having a great reduction in new HIV infections (Nwangwu-Ike, Hernandez, An, Huang, & Hall, 2015). HIV-related deaths remain among the top 10 causes of death nationally (CDC, n.d.; CDC, 2020) and among the 5th leading cause of death in Texas State among Black women and 10th for Hispanic women (TDSHS, 2020c). This same data showed that Texan women overall were dying at higher rates than men among PLHIV. Similarly, AIDS-related hospitalizations among women were predominantly (64%) Black women (Betz et al., 2005). This study also found a high proportion of co-occurring mental health and SUD morbidities among AIDS-defining illness-related hospitalizations among minorities (Betz et al., 2005). Being female and using drugs or alcohol were also found to be associated with the utilization of informal care only among patients triply diagnosed with HIV, mental disorders and SUD (Ettner et al., 2008).

Many of the barriers to treatment and health outcomes among PLHIV, including ART adherence, are social determinants such as cost, transportation, lack of support, gender and cultural norms, geopolitical factors such as immigration status, fear of disclosure of HIV status due to HIV related stigma whether perceived or enacted by community members (Hargreaves et al., 2018; R. C. Patel et al., 2016; Thomford et al., 2020). Trauma from IPV, in addition to mental disorders and stigma, has been associated with worse health outcomes in addition to increased sexual risk (Whetten et al., 2008). Among Black women in Texas, structural factors

such as low SES, stigma and trauma contributed significantly to HIV-related health disparities (TDSHS, 2020a), while lack of insurance was highlighted for the trends seen among Hispanic women (TDSHS HIV/STD Program, 2016).

Reviews of relevant research from 2005 to 2016 among Black women and from 2008 to 2018 among Hispanic women revealed that treatment and health outcomes for these minority women share common determinants. However, they also have some factors that are different, although studies along the HIV care continuum among Hispanic women are limited (Geter, Sutton, & Hubbard McCree, 2018; Geter Fugerson, Sutton, & Hubbard McCree, 2019). Barriers to HIV-related care among Black women included lack of family and/or social support, low-quality HIV care, and HCPs' stigmatization (Geter, Sutton, & Hubbard McCree, 2018). While resilience, good relationships with case managers and support personnel, racial consciousness, and mental health care facilitated better engagement in care and health outcomes such as medication adherence and viral suppression (Geter, Sutton, & Hubbard McCree, 2018). Hispanic women continue to face HIV-related health disparities due to health professionals' stigmatization, immigration-related legalities and language barriers in access and utilization of HIV care services, including treatment (Geter Fugerson et al., 2019). Language barriers, cultural stigma of HIV and mental health issues were also found to suppress Hispanic women's disclosure of their HIV status and the related emotional and mental burden (Enriquez et al., 2010). Low SES, discrimination and health education, and lack of access to quality HIV care are contributing factors to delayed engagement in care and poor health outcomes among women in the U.S. (Aziz & Smith, 2011).

Treatment and health outcomes among women are influenced by many complex factors starting with challenges in linkage to care, which is also affected by a delay in getting tested for

HIV (Aziz & Smith, 2011). Besides having a larger risk of HIV infection at 14 times the rate of White and 5 times the rate of Hispanic women, a statistical trend reflected at the state level as well, Black women in the U.S. also have consistently experienced poorer health outcomes with higher rates of advanced disease stage of AIDS at diagnosis indicating late diagnosis (CDC, 2018; TDSHS, 2020a). Numerous factors, such as misperceptions of risk and socioeconomic disadvantages, delay in initiation of treatment, lack of trust in providers, and SUD, are a few factors that lead to poor health outcomes among minority women (Aziz & Smith, 2011). Quality of care also impacts minority women's treatment outcomes and includes perceptions of judgment by the provider, timely delivery, equity and facilitation of access, patient-centeredness, and effectiveness (Rice et al., 2020). Alcohol and IDU are also associated with poorer quality of care among PLHIV (Korthuis et al., 2012).

Moreover, prevention strategies such as HIV testing were low among women who engaged in high-risk sexual activity such as anal sex (Evans et al., 2018), contributing to the persistent lack of knowledge of HIV status among women (CDC, 2020b). A large percentage of new infections (91.5%) are also caused by people not knowing their HIV status or who were not receiving treatment in 2009 (Skarbinski et al., 2015). The data also show that prevention strategies such as PrEP coverage were very low among females compared to males who were 16 years or older in 2018 (CDC, 2018).

Due to the complex nature of HIV infection and the required care to ensure optimal sexual and reproductive health among women and the potential impact that treatment and ancillary care can have on unborn children, special guidelines must be followed when treating and caring for WLHIV (Aberg et al., 2013). These guidelines have strict recommendations for ART among WLHIV. ART adherence as HIV prevention is an important aspect of women's

health and is limited by multiple social determinants; thus, it is important to explore their impact on the attitudes toward this U=U concept (Bavinton & Rodger, 2020; Cohen, Pepperrell, & Venter, 2020).

HIV treatment as prevention - undetectable equals untransmittable

The U=U concept states that if an individual has less than 200 copies of HIV 1 RNA circulating in their blood that is not detected by HIV tests, then effectively, the individual is not able to transmit the virus to an HIV-negative person (Rodger, et. al., 2018; Rodger, et al., 2016). The U=U concept gained scientific support through several prospective observational studies and through randomized control trials investigating the TasP model (Bavinton, et al., 2018; Cohen, et al., 2016; Cohen, et al., 2011; Rodger, et al., 2019). The TasP emphasizes that medications such as PrEP and PEP in HIV-negative persons (CDC, 2016b) and ART in HIV-positive individuals can be used to prevent the transmission and subsequent incidence and prevalence of HIV (Cohen, et al., 2016).

Early studies investigating the efficacy of ART among PLHIV established that early ART treatment reduced the progression to the development of AIDS, the end-stage clinical outcome of HIV infection, and improved survival (Graham et al., 1992; Hamilton et al., 1992). These studies examined CD4+ cell counts (<200 cells/mL), viral loads (<200 HIV RNA copies/mL), and AIDS indicators such as infection with Tuberculosis (TB) or Pneumocystis Carinii (PCC), fever, pneumonia, diarrhea, AIDS dementia complex, among others, together referred to as the syndromes of AIDS. People who were on ART had better health outcomes with a slower progression to developing AIDS syndromes than those not on ART (Fischl et al., 1987; Volberding et al., 1990). People with CD4+ counts at or above 350 cells/mL who started ART early also showed better health outcomes with delayed onset of the symptoms of AIDS compared

to those who started later on ART (i.e., those who started ART once their CD4+ cell counts fell below 200 copies/mL) (Cohen, et al., 2011; Grinsztejn et al., 2014). Furthermore, a landmark study in Uganda where ART was not available to PLHIV showed that viral load was the single most important predictor of transmission of HIV among serodifferent/serodiscordant couples (i.e., index case is HIV positive and regular partner is HIV negative) (Quinn et al., 2000). It also found that among those who were HIV-negative, circumcision in males protected against HIV transmission from infected females.

The HIV Prevention Trials Network (HPTN 052) investigations revealed that among over seventeen hundred serodiscordant couples in nine different countries, the majority from Africa and heterosexuals, those on early ART prevented over 93-96% of HIV transmissions (Cohen, et al., 2016; Cohen, et al., 2011). Participants in this study were counseled and encouraged to use condoms. Therefore, the study was criticized for not being able to say what the absolutes risk reduction or HIV prevention rate was based on biomedical prevention alone since condoms were utilized (Rodger, 2013), a scientifically proven physical intervention to reduce transmission as well (de Vincenzi, 1994). The study was also negatively evaluated because of the lack of sexual minorities, such as homosexual couples among the participants. Subsequently, the PARTNER study, which consisted of two phases, was conducted to determine the rate of genetically linked HIV transmission among both heterosexual and homosexual serodiscordant couples who engaged in condomless sex and whose index case (i.e., HIV-positive partner) was adherent to ART and had a viral load below 200 copies/mL (Rodger, et al., 2019; Rodger, et al., 2016). The results of this study cemented the concept that there is effectively a zero rate of transmission of HIV to uninfected partners when the PLHIV is adherent to ART and has an undetectable viral load (Eisinger et al., 2019). The Opposites Attract study, which was composed entirely of

homosexual couples, reported similar findings as the PARTNER studies (Bavinton, et al., 2018). Hence, a campaign of U=U was started in 2016 to promote the message (Simek, 2017), and the concept has been endorsed by health officials at the highest public health office in the United States (U.S.), the National Institutes of Health, and almost a decade earlier by officials in Switzerland (Eisinger et al., 2019; Guerrero, 2017; Vernazza & Hirschel, 2008).

The U=U era now changes the goal of treatment from controlling or reducing disease progression to disease/transmission prevention both for vertical mother-to-child and sexual transmission (Hull & Montaner, 2013). TasP is classified as a form of biomedical prevention of transmission of HIV through medications which started with mother-to-child vertical transmission prevention. Systematic reviews of the literature have shown that ART prevents vertical transmission and PrEP prevents high-risk transmission when used according to recommended guidelines (Okwundu, 2012). Treatments such as PrEP, microbicides and male circumcisions (especially in high-prevalence areas such as South Africa) are other forms of biomedical prevention (HIV transmission and acquisition prevention) (Long & Stavert, 2013). Monte Carlo simulation models show that approximately 28% and one-third of future HIV infections could be prevented with PrEP and ART, respectively; while a combination of all these biomedical methods, including screening and linkage to care, could contribute to an estimated 62% reduction of new HIV infections leading to a 4% reduction in HIV prevalence rates over a decade, adding 31 million quality-adjusted life years (Long & Stavert, 2013). One form of biomedical prevention that did not progress further than clinical trials includes vaccines, both for prevention in HIV-negative persons and therapy for PLHIV (Vermund et al., 2013). The preventative trials did not produce expected viral outcomes upon seroconversion of participants and the therapeutic vaccines were not found to be sufficiently effective (Vermund et al., 2013).

Studies of oral and topical PrEP —vaginal tenofovir gel and monthly dapivirine ring — among women were also not as efficacious, and suboptimal adherence was seen as a major barrier, according to one review (Heumann, 2018). These other forms of biomedical prevention are briefly mentioned here as a background to increase understanding of these prevention strategies in this paradigm of biomedical prevention. However, they will not be further discussed as they are outside the scope of this paper.

Racial/ethnic minority women's attitude toward HIV prevention and treatment

Hispanic women have been underrepresented in HIV-related studies, including research about medication adherence, treatment outcomes and attitudes toward TasP. Similarly, the literature shows that Black women have been involved in few studies investigating attitudes toward treatment and for both minority groups, none have been included, to my knowledge, about U = U. Pre-and post-HAART studies reveal that Black women still hold negative attitudes toward treatment.

A qualitative study with 59 low-income Hispanic/Latina women, predominantly Mexican, found that Hispanic/Latina women generally did not know about ART and they held many misconceptions about HIV prevention, transmission, and treatment (Flaskerud & Calvillo, 1991). Despite having knowledge about the scientifically proven routes of HIV transmission, some erroneous beliefs expressed by the women were that HIV is transmitted through rectal excretions that contained "impurities" during anal sex and sex with a bisexual, beliefs that the authors noted were implicating that all persons who practiced these modes of sexual activities were infected with HIV (Flaskerud & Calvillo, 1991). They also believed that kissing, swimming in contaminated spa/pool water, or sitting on urine or blood-soiled toilet seats could transmit the virus. The authors stated that "the women had not heard of AZT (zidovudine) or

other antivirals or antibiotics in use" (Flaskerud & Calvillo, 1991, p. 436). Participants in this Los Angeles-based study believed that penicillin and a Mexican herb called pepinillo were cures for AIDS. They also engaged in practices such as injecting vitamins and garlic, ingesting mineral water to purge the blood, and boiling the bark of the Paquerbo tree (Flaskerud & Calvillo, 1991). Also highlighted by the authors was the fact that U.S.-born Hispanic/Latina women were less expressive about traditional remedies and beliefs compared to those born outside the U.S.

Other studies found that women infected with HIV generally held very negative attitudes about treatment, particularly toward the early drug, azidothymidine, also called Zidovudine (AZT). An early New York-based qualitative study by Siegel & Gorey (1997) with 71 women, the majority Black (42%) and Puerto Rican (40%) found that Black women particularly expressed strong negative attitudes while White women were more inclined to positive attitudes and recommended the use of the drug when a medical situation indicated its need. Others also reported taking the drug in hopes of better health outcomes for their unborn babies, and some even reported being satisfied when they have not experienced side effects. Those who shared negative attitudes expressed distrust toward providers prescribing the drug, questioning their motives for giving it to minority women who were not a part of clinical trials for the medication; highlighted concerns about possible effects on unborn babies; and also shared their lack of adherence to the medication due to toxicity and negative side effects (Siegel & Gorey, 1997). Black women expressed their negative attitudes toward AZT treatment, with one woman suggesting that it was like a bullet that kills indiscriminately and others describing the drug as "a killer" and "toxic waste" (Siegel & Gorey, 1997). Side effects such as headaches, breathing difficulties, low red blood cell count, nerve damage, leg pains, liver damage, cancers, and

blackening of fingertips and nails were associated with AZT use. They also felt that doctors were prescribing the drug to everyone infected without taking into consideration personal factors such as mental health, background, lifestyle, gender differences, and health status (Siegel & Gorey, 1997).

Another qualitative study among 22 predominantly Black women (82%) who were previously or presently pregnant or who could potentially become pregnant and who were infected with HIV and living in two southern states by Misener & Sowell (1998) found similar negative attitudes. Health professionals' influence and side effects, family beliefs and attitudes influenced women's medication beliefs and adherence (Misener & Sowell, 1998). Women talked about their lack of trust in the HCP, suggesting that providers were limited in their knowledge about HIV and treatment options, and lack of trust in the medication, seeing it as an experimental drug in which they were being used as "guinea pigs," especially due to their vulnerability being pregnant (Misener & Sowell, 1998). The women referred to the Tuskegee experiment, where Black male prisoners were not given treatment for syphilis in order to see the outcomes of the natural course of the infection, and also stated that doctors were pushing the AZT drug because they were forced to do so to keep their license, not having the women's health and well-being at the center of treatment decisions. As a result, the women reported being dishonest with their HCPs about non-adherence out of fear of being incarcerated or losing social services (Misener & Sowell, 1998). The women "did not believe that antiretrovirals were effective in either treating or decreasing the transmission of HIV infection …. It [AZT] just don't work" (Misener & Sowell, 1998, p. 438 - 439). These women, like those in the previous study, viewed AZT as something that would kill them, bringing more harm than good to them and their unborn children. Some mentioned that AZT was causing babies to be born without limbs, organs

or stillborn. Similar side effects from AZT were mentioned among this group of women, as in the previous study, such as nausea, fatigue, vomiting etc., while others reported no side effects in themselves or their babies (Misener & Sowell, 1998). Mothers of the women and HIV-infected peers in support groups were also sources of negative attitudes toward AZT, with mothers discouraging their daughters from taking the medication and peers advocating holistic care with natural remedies and eating fruits and vegetables.

Despite the evidence that ART reduced vertical transmission from mother to child (Lallemant et al., 2000; Vithayasai et al., 2002), the quality of the patient-provider relationship (Sowell et al., 1999) and, most importantly, childbearing safety (Richter et al., 2002) were important factors that greatly influenced women's decision to take ART. In the study by Richter and colleagues (2002) with 33 African American WLHIV who were of childbearing age, the authors found that while some women considered the AZT use as a form of control over their infection and that it gave them some hope for living longer, others had negative attitudes relating to the side effects, their lack of belief in the efficacy of the drug, concerns about the "trial and error" in the treatment process and the belief that they were being used as "guinea pigs" in an experiment. The researchers found that the attitudes of the women reflected their compliance with the medication. One woman reported that her T cells were low, but they increased without taking medicine. The women expressed their concern about the long-term effects that AZT would have on their baby, and so they expressed that they would not take AZT while pregnant, citing their opinion on the fact that doctors were not 100% sure of the long-term effects of the drug on children (Richter et al., 2002). The women expressed their beliefs that when it comes to AZT and childbearing, they would want to hear more from other women infected with HIV who had children as opposed to the opinions of medical professionals, as they knew that HIV-infected

women could give birth to non-infected babies without taking medication and some were willing to "play the odds" (Richter et al., 2002).

Side effects of medication on mother and child are not the only factors that determine attitudes toward medication. Research has shown more complex emotional and social dimensions for intentional nonadherence among women (Roberts & Mann, 2003). Diary or journal entries that were completed over a 4 week period and were done at a frequency of twice weekly for 10 minutes each comprise the results of this qualitative (narrative) study in which women were asked to "write about a future in which you only have to take one pill each day for your HIV" (Roberts & Mann, 2003, p. 556) but they inadvertently also wrote about the challenges that they faced with their present ART. The authors described the story of one woman, Maria, that highlighted the fact that she consciously chose not to adhere to her medication while on vacation because it gave a sense of not living her "real life" and she could have freedom from the drug without experiencing side effects around her family and friends. However, even after a visit with her provider at the end of the vacation, she was not totally in concert with the provider's decision to restart her medication. As she weighed the costs of the side effects and benefits of living longer, she wrote, "Knowing whether or not I am taking meds, well, will this prevent an illness or just prolong an existence??? Well, I tell you sometimes it's just too much for me.... I guess the odd thing is that I am not worried about dying, I'm worried about living." (Roberts & Mann, 2003, p. 560). This control over when to take medication shows that non-adherence changes with time, circumstance and emotions and that attitudes toward HIV treatment are affected by complex factors.

Even in the HAART era, women still have negative attitudes toward ART, although it was less in comparison to pr-HAART. A study comparing attitudes among 79 matched pairs —

race, age (within five years), length of time since diagnosis (i.e.,<2, 2–5, or>5 years), stage of disease, and IDU history since 1977 — of predominantly African American women, along with Puerto Rican and White women, in the pre-HAART and HAART eras, found that women across ethnicities expressed less negative attitudes toward ART although still citing some medication side effects concerns with the introduction of HAART (Schrimshaw et al., 2005). The authors also noted that, unlike Pre-HAART women who would more than likely not be taking ART or adhering to ART due to side effects, in particular from AZT, in the HAART, there were higher proportions taking ART and greater numbers adhering to their regimen. Women were more open to trying different drug combinations if their current one was not working or if they were having adverse side effects (Schrimshaw et al., 2005). African American women continued to have the greatest negative attitude toward treatment in the HAART era (Schrimshaw et al., 2005). While White women with AIDS discussed their perception that they have benefitted from HAART with regard to the medication "doing its job" in making them reach undetectable viral load levels, African American women felt that HAART did not improve their health or their lives. One study found that stigma played a major role in ART nonadherence, while social and HCP support were identified as contributing factors among those who always adhered among a sample of 15 African American women who were on HAART (Sankar et al., 2002). The researchers of this study were investigating "the adherence profile, the self-assessment of adherence, and the perceived sources of influence in adherence practice;" they found that most women (69%) were always or mostly adherent and sources of influence, like other studies, include God, family members and unlike others, television programs (Sankar et al., 2002, p. 208).

Women's attitude toward biomedical/ART treatment as prevention and U=U

Similar to the pre-HAART and HAART eras of under-representation of women in HIV prevention and treatment research (Sullivan et al., 2007), the U=U era also has a major lack of women's voices toward biomedical prevention of HIV, and none, to my knowledge, has explored only women's attitude toward U=U concept. Few studies have been found that addressed this outcome. For example, in Kenya, although knowledge of biomedical HIV prevention was low, women who inject drugs were generally open to trying at least one form of biomedical prevention to protect themselves as one woman stated, "since I don't know how my husband goes about outside [with other partners]" (Bazzi et al., 2018, p. 344). The women expressed similar concerns of safety and distrust in the effectiveness of biomedical methods, similar to those expressed by women toward ART and HAART. "I am worried about this gel because I don't know its side effects [and] am not sure if [it] will kill HIV," stated one participant (Bazzi et al., 2018, p. 344). A review that used a meta-ethnographic approach of women-controlled biomedical prevention methods across 22 papers, which included 11 studies from 13 Sub-Saharan African countries, found that women were motivated to use some products such as the gel and microbicide because these products enhanced their sexual experience and contributed to overall relationship building while also empowering them to protect themselves against HIV transmission and promoting their health and well-being (Eakle, Bourne, Jarrett, Stadler, & Larson, 2017). However, some barriers were also highlighted, which included distrust and possible violence in intimate relationships, stigmatization by family members who equated antiretrovirals in tablet forms with being HIV positive, although the intervention is prevention-based in HIV negative individuals (Eakle et al., 2017). Mistrust in the efficacy of the prevention method, as well as outsiders or foreigners, also influenced decisions to use biomedical

interventions as some partners and community members believed that the gel was contaminated with HIV and it was an intentional act on the part of the suppliers. For example, one paper in the review had the statement, “So I sometimes think what if what my friends are saying is true, as they say ‘what if they are infecting you with AIDS using that gel?” (Eakle et al., 2017, p. 17).

A study among PLHIV which included 1040 participants, 23% of whom were women, in the State of Georgia found that a high proportion of participants (63%) did not disclose their HIV status with their sexual partners and that condomless sex was very high (84%) and more likely with HIV negative or unknown status partners among those sexually active (Kalichman et al., 2016). Women comprised less than a quarter of the participants, and a similar proportion of these women (24%) reported engaging in condomless sex. Multiple regression modeling revealed that engagement in condomless sex was predicted by infectiousness beliefs and transmission risk perceptions which were significant and exceeded the predictability of other factors in the model (Kalichman et al., 2016). PLHIV who engaged in condomless sex endorsed the U=U concept that transmission risk is reduced when the partner has an undetected viral load, and this was a significant finding; whereas beliefs that undetectable viral loads lead to safer sex was not different between those who engaged in condomless sex versus those who did not (Kalichman et al., 2016). The study participants were majority African American males living with HIV for over a decade, which indicates that the beliefs of women may not be adequately represented. Moreover, the tone of this study was one of caution on the inadvertent risks of sexually transmitted diseases among PLHIV who endorse the U=U concept and engage in condomless sex, and the authors highlighted the need for complementary behavioral risk reduction strategy along with TasP to address these risks (Kalichman et al., 2016; Kalichman et al., 2015).

Another study among 2389 PLHIV, one-third of whom were women, across 25 countries found that only 66.6% of the participants had ever discussed U=U with their health providers and women (64.7%) were slightly lower than men (66.6%) for this outcome (Okoli et al., 2020). Heterosexual men had even lower proportions (57.6%) for prior discussion about U=U in this study. Those who had discussed U=U with HCP had higher odds of viral suppression and lower odds of non-adherence to their medication compared to those who had heard about U=U from sources other than their HCP and those who were unaware of U=U (Okoli et al., 2020). Physical, mental and sexual health were better among participants who had knowledge about U=U and discussed it with their HCP (Okoli et al., 2020). However, the authors acknowledged that there were some gender and age differences in health outcomes. For example, women younger than 50 years old were less likely to tell others about their HIV status, while men older than 50 years old were more likely to disclose.

Unlike the PLHIV in the previously discussed study, negative attitudes toward U=U were found among HIV-negative partners and medical personnel who expressed misunderstanding and doubt in the efficacy of the science behind the U=U research and distrust for its promise of protection against HIV transmission (Ngure et al., 2020). A qualitative study in Kenya with 83 health providers and 61 HIV-negative men and women in serodiscordant relationships who were accessing PrEP services in the Partners Scale-Up Project revealed that HIV-negative partners trust PrEP, not ART to keep them safe from contracting the virus (Ngure et al., 2020). They believed that there is still a risk of getting infected with HIV even if the index partner is on ART. One male HIV-negative partner stated, “I would never stop taking PrEP because I am not sure of her viral suppression” (Ngure et al., 2020, p. 4). Overall, the participants were not trusting in their HIV-positive partners to maintain viral suppression and thus would not risk ceasing PrEP

use. Similarly, the health providers shared similar sentiments as one indicated that they do not counsel HIV-positive patients about U=U, only HIV-negative patients. They believed that if they counseled PLHIV about the effectiveness of ART in reducing HIV transmission because they fear that it would lead to increased RSBs among PLHIV (Ngure et al., 2020). A female, an HTS Counsellor, stated, "…but sometimes, we do not tell them that their chances of infecting others is minimal because some will get loose" (Ngure et al., 2020, p. 4). Other health professionals did not understand the science behind U=U and so did not completely trust its efficacy and feared that they would be blamed if people became infected. A female Peer Educator responded, "I don't believe in that even if they are low and undetectable and there are many discordant couples here that their HIV partners are already low and undetectable, but we have never told them that they should stop taking PrEP" (Ngure et al., 2020, p. 4). Like others, this study did not highlight the attitudes of women compared to men.

Most studies that seek to understand attitudes toward U=U are done among MSM and other SMM. Women's attitudes toward this concept have not been explored and there is limited data regarding their awareness, perceptions and beliefs about U=U. As a result, I will briefly discuss a few studies that included men only or were majority men.

A few of the first studies that investigated the acceptability of the TasP model took place in Australia in 2011 and 2013, in which key populations, gay and bisexual men, were prioritized (Holt et al., 2014). They found that among 1,316 participants, the majority being HIV negative, 2.6% of the men agreed — more likely those who were HIV positive, had an HIV positive partner or who had past use of PEP — to the TasP concepts that treatment and an undetectable viral load prevents transmission although almost three-quarters of the men believed in the health benefits of ART (Holt et al., 2014). Statistical analysis revealed that there were no changes from

2011 to 2013 in attitudes toward TasP among the men except that less skepticism about the efficacy of treatment to prevent transmission was found among those who were HIV-negative in 2013. Among a similar population of men in Australia, a higher percentage (approximately 20%) agreed to TasP in the HIV Treatment Optimism Scale, which was starkly contrasted by 77.9% of the same men believing in the efficacy of PrEP to prevent HIV acquisition (Wilkinson et al., 2018). The authors noted that this difference in attitude might be due to personal responsibility perceived by men to protect themselves.

In the U.S., similar to those in Australia, SMM has been the main study group in the attitudes toward the U=U concept. Rendina & Parsons (2018) analyzed attitudes toward U=U among 12,222 gay, bisexual, and other MSM (GBMSM) and stratified according to HIV status through data collected using social network sites for recruitment. They found that less than half of the HIV-negative men believed the accuracy of U=U while, like previous studies, higher accuracy agreement was found among those who were seropositive for HIV, although about one-third of these still thought there were some inaccuracies to the message (Rendina & Parsons, 2018). The proportion of those who believed in the effectiveness of treatment to prevent transmission was greater than those in the Australian studies. Unfortunately, engaging in RSBs, such as having anal sex with a casual serodiscordant partner, lack of concern about sexually transmitted diseases and having an undetectable viral load were associated with endorsement of the accuracy of the message among HIV-positive men (Rendina & Parsons, 2018). Among HIV-negative and status-unknown men, rating the U=U as more accurate was associated with a lower perception of HIV risk and lower concern about other STIs as well. Increases in the acceptance of the U=U through the TasP strategy were attributed to an increase in knowledge and information regarding TasP among those who accessed PrEP services (Wilkinson et al., 2018).

A similar sentiment was shared by the authors of this study, highlighting the finding that among HIV-negative men, those who were using PrEP and regularly tested for HIV were more likely to rate the accuracy of U=U higher (Rendina & Parsons, 2018). A later study, 2018 – 2019 (a span of 23 months), evaluated the personal and social benefits of U=U among 30,361 adolescent and adult SMM living with HIV across the U.S. (Rendina et al., 2020). Among this study group, about two-thirds had discussed U=U with their providers, and Blacks were more likely, compared to Hispanics and Whites, to have heard about U=U from providers, similar to the trends seen in the study by Okoli et al. (2020) across multiple countries. The researchers found an association between undetectable viral load and excellent ART adherence with higher ratings of the benefits of U = U and an increased likelihood of provider discussion of U=U (Rendina et al., 2020). Although perceptions of U=U made the SMM greatly enhanced their self-image, their feelings about their HIV status and improved their perceptions of societal HIV stigma (Rendina et al., 2020), which supports the far-reaching psychological impact at the individual and societal levels, an earlier study, 2017 – 2018, among 111,747 of the same population of men showed that a little more than half of the men (53.2%) believed in the accuracy of the U=U concept (Rendina et al., 2020). The trend of increased acceptance among HIV-positive men was once again seen, with 83.9% believing in the accuracy of U=U compared to only 53.8% of those who were HIV-negative. However, the authors noted that perceptions of risk of transmission were still prevalent with a low proportion of participants, 10% in the insertive role and 14% in the receptive role, agreeing that there is a zero risk of transmission under U=U during condomless sex; they believed that the framing of the message from transmission risk to protective benefits might be more successful and comparable to other HIV prevention methods (Rendina et al., 2020). This study also found a statistically significant association between low perception of risk during

casual anal sex with an undetectable partner and endorsement of the U =U (Rendina et al., 2020). Unlike the previous study that found higher beliefs in the accuracy of U=U among those recruited from social network apps as opposed to social network sites (Rendina & Parsons, 2018), this study found lower endorsements of the accuracy of U=U among individuals from this source as well as among those who identified bisexual and single (Rendina et al., 2020).

In summary, minority women share a high burden of HIV/AIDS risk and disease globally, nationally and locally. However, studies about HIV prevention and treatment in the era of TasP and U=U have limited representation from women. As a result, the concept of U=U in the paradigm of TasP is understudied among women and generally (Heumann, 2018). Obtaining a deeper understanding of women's attitudes toward U=U and the factors that impact these are much needed areas of study, especially among minority women who are at great risk for HIV and have the highest burden of disease in all levels of society. Furthermore, identifying, addressing and eliminating attitudinal barriers to treatment is important for primary and secondary HIV prevention (Siegel & Gorey, 1997) among minority women who are at risk, and the implications of the U=U message are far-reaching for those at risk and for PLHIV as seen in Appendix D. Therefore, there is a need to explore women's attitudes toward U=U and identify the associated factors among this high-risk group.

CHAPTER III - METHODS

Study design

A convergent parallel mixed methods design (Creswell, 2014) was employed where qualitative data was collected using semi-structured open-ended interview questions and quantitative data was gathered cross-sectionally via a survey (Appendix E). This study design was utilized since the qualitative and quantitative approaches alone could not adequately capture the understanding of the phenomenon of interest (Creswell, 2014). Subsequently, combining the strengths of each made the convergent mixed methods approach ideal for this study (Creswell, 2014). The advantage of the qualitative approach lies in the ability to investigate and explore a topic with few research studies, as is the case of attitudes toward U=U among minority women. The advantage of quantitative research is identifying associations between factors and outcomes. The qualitative data in this study design provided a richer and more in-depth perspective of the topic that was collected simultaneously with and also explored parallel variables/constructs as the quantitative data (Creswell, 2014). The data collected from the two approaches were analyzed separately and then triangulated to provide a comprehensive analysis. A mixed method approach to research is usually underpinned by the pragmatic philosophical worldview where the focus is on the research problem and pluralistic approaches, i.e., researchers are free to utilize methods that they believe are best to achieve the objectives of the study, are used to increase knowledge and understanding of the research question (Creswell, 2014). Although it does not conform to a single set of assumptions, this philosophical perspective lends itself to studying topics within social contexts and can have a social justice lens. This philosophical approach was adequate in this study since minority women are underrepresented in the discourse about U=U despite being at a higher risk for acquiring HIV.

Participants

Sample size. According to the literature, 20 – 25 participants were needed for the qualitative study to acquire enough data for saturation and to validate themes (Creswell & Poth, 2018). A sample size analysis in G* Power Suite 3.1 using a Logistic Regression Assessment (Sullivan, 2012) at a power of 0.8 and alpha level of 0.05 with an effect size of 3.0, which is the theoretical moderate effect size for Social Science data (Ferguson, 2016), indicated that a total of 131 participants were needed for the quantitative U=U study. Accounting for a 10% of incomplete survey rate, an additional 13 participants were included for a total sample of approximately 144 individuals.

Inclusion criteria. Racial/ethnic minority women 18 years and above who are autonomous in decision-making were eligible to participate. However, although non-Hispanic White women were not excluded from participation in survey data collection in person, they were excluded from the analysis.

Exclusion criteria. Individuals who identified as men were excluded from this study. Women with severe mental health problems and cognitive deficits were excluded from the study. Non-Hispanic White women were excluded from qualitative data collection. These were necessary since the population of interest was racial/ethnic minority women and for optimal use of limited time and resources.

Recruitment. Racial/ethnic minority women were recruited purposively either in person, online, and through a referral from community-based organizations (CBOs) that serve women with SUD, mental illness and IPV, such as transitional and emergency shelters, behavioral treatment centers, addiction support groups, and public events targeted to this population. In all email communication and in-person recruitment activities, the study flyer, which was available

in English and Spanish (Appendix F), was shared with contacts and participants. COVID-19 restrictions and protocols were followed in several instances due to exposure at recruitment facilities. Subsequently, study presentation/participant recruitment and some interviews were done online. Recruitment also took place through electronic/online referrals and via Facebook on one organization's website, serving the priority group as done in other studies with at-risk populations (Rendina & Parsons, 2018). The surveys were constructed using Question Pro while interviews were done using Zoom to ensure privacy, security and confidentiality.

Procedures

Recruitment for both quantitative and qualitative portions was done simultaneously, given the convergent mixed-method design of the study. Women were approached and recruited at various sites across El Paso City, including partner organizations such as behavioral and mental health treatment facilities, women's shelters, women's advocacy groups, and other relevant public sites. In addition, partnering organizations of the Minority AIDS Research Center (MARC) referred women to the study by providing study promotion material to them to contact the researcher. The informed consent process was completed throughout the study in a culturally and regionally sensitive manner.

Participants who indicated that they wanted to participate in the interview were scheduled date, time, place (which ensures privacy) and language of their choice with the researcher. A trained Spanish-speaking research assistant was identified to assist with conducting interviews for those who spoke Spanish. However, all participants interviewed spoke English. Upon written (electronically signed by online participants; Appendix G) and verbal consent to partake and be recorded on the day of the interview, the participant was given a short standard survey to complete, or it was completed by the researcher if it was through Zoom. Interviews lasted

approximately 30 minutes and were audio recorded, transcribed, analyzed and assessed for quality. During the interview, an open-ended question guide was used to elicit the views and opinions of the participants. At the end of the interview, participants were thanked, compensated with a $15.00 gift card and given an information resource sheet that provided links to local behavioral and mental CBOs websites. Participants who agreed to partake in the quantitative part of the study completed a self-administered survey (available in both English and Spanish *and* in-person on paper and online) which took approximately 30 minutes after also going through the consent process to partake in the study. The researcher and/or assistant was available to answer any questions from in-person survey and interview participants, and online interview participants. Online survey participants read the consent form (Appendix G) provided and indicated their consent by clicking the "Agree" button. All completed paper surveys were placed in a secured and private box. Participants were compensated with gift cards valued at $10.00, while eligible online participants were sent an electronic $10.00 gift card if they optionally provided their email at the end of the survey. Survey participants were also provided with the information sheet as a downloadable file or on paper (Appendix H). The emails were deleted from data analysis files and were kept in a separate file from the original downloaded data for grant accountability and reporting purposes. No identifying information was collected on paper surveys.

Measures

Awareness and attitudes were investigated as the outcome variables in the study's qualitative and quantitative segments. Attitude was assessed in three domains: Affective, behavioral and cognitive across the two methods. Affective was measured using a question about how people feel about U=U; cognitive was investigated by assessing beliefs in the

accuracy of U=U and perceptions of HIV risk in the context of U=U; behavioral was assessed by asking whether they would engage in sexual intercourse with an individual who has an undetectable viral load. Independent factors at the individual, interpersonal, organizational and community levels of the SEM were explored in the qualitative data collection and measured using validated instruments, where available, in the survey data.

Awareness of and attitudes toward U=U – Qualitative data.

Awareness of and attitude toward U=U. A semi-structured survey with open-ended questions was used to explore women's awareness of, attitudes toward, and beliefs about U=U; see Appendix E for the open-ended questions and protocol. Major domains explored included experiences with PLHIV, perception about personal HIV risk, attitudes toward PLHIV, attitudes toward HIV treatment, awareness and beliefs about U =U — its efficacy and implications of U=U on sexual and reproductive health — and sexual risks among PLHIV. SEM factors that influence these attitudes about PLHIV, HIV treatment and U=U, including sociocultural/community, geopolitical, and individual factors, were investigated since these have been shown to influence attitudes. They included demographics, nativity, past experiences and behaviors, prejudice, attitude towards HIV treatment, mental health, social norms (cultural, religious and gender), social connectedness, proximity to someone with HIV, and socio-environmental characteristics at the El Paso, TX - Juarez, Mexico border.

In the interview process, the researcher is considered the instrument and must gather the data relevant to the research question using the question protocol as a guide (Creswell & Poth, 2018). Using open-ended questions in an interview to elicit a deeper understanding of the problem is also in accordance with the pragmatic philosophical tenets that guide the convergent mixed methods approach and stipulates that researchers can use data collection techniques that

best fit the need of the study (Creswell, 2014). Another valuable characteristic of the qualitative interview data is that it was transcribed and analyzed upon collection, allowing for an iterative process of data collection and analysis at the start and throughout the study until data saturation was achieved (Creswell & Poth, 2018).

Awareness and attitudes toward U=U – Survey data. Awareness and attitudes toward U=U in different domains were assessed using single items for each question, scored separately, and treated as separate outcomes.

Awareness of U=U. "I have heard about U=U prior to this study" (No/Yes). If yes, from whom? HCP or another source (Okoli et al., 2020).

Attitude towards U=U. "With regard to HIV-positive individuals transmitting HIV through sexual contact, how accurate do you believe the slogan Undetectable = Untransmittable is (Rendina & Parsons, 2018)? Responses ranged from 1 - completely inaccurate to 4 completely accurate, as well as a fifth choice to indicate that they don't know. Responses were coded and dichotomized to 0 – inaccurate/somewhat inaccurate/somewhat accurate/unsure and 1 – completely accurate. A single item measured perception of risk in the context of U = U, "What is the risk that an HIV -positive individual who is currently undetectable could transmit HIV sexually to his/her partner?" (Rendina et al., 2020). Responses ranged from 0 - no risk, small risk, medium risk, high risk, and 4 - complete risk. This variable was dichotomized to 0 – no risk and 1 – risk. Sexual behavior in the context of U=U was assessed by asking, "How likely would you be to have condomless sex with a partner who is HIV-positive and has an undetectable HIV load?" Responses ranged from 1 - very unlikely to 5 – very likely and were dichotomized to 0 (no) – unsure and below and 1 (yes) – likely and above (Carneiro et al., 2020). In each of the cited studies, the single items were used as the outcome variable or a factor

variable. However, the accuracy and risk beliefs related to U=U were the sole outcome variable in the cited studies. In this study, these items were both used as attitude outcome variables. The results were dichotomized to those who completely agree versus those who partially agree/disagree and completely disagree with the accuracy statement. A binary logistic regression analysis was done to look at factors associated with different levels of agreement as in previous studies (Rendina et al., 2020; Rendina et al., 2020).

Individual factors.

Demographics. Race/ethnicity, age, education, employment, marital status, religion (i.e., what type of religion do you identify with?), sexual orientation, HIV status and past PrEP use were collected using standard demographic survey questions (See Appendix E for demographic questions and response formats). Among HIV-negative SMM Black race, identifying as gay/queer, frequent HIV testing and current PrEP use were associated with increased favorable attitudes and trust toward U=U (Rendina et al., 2020; Rendina & Parsons, 2018). Research showed that HIV-negative SMM have very low awareness and agreement of TasP (Holt et al., 2014) and U=U (Rendina et al., 2020) compared to those who are HIV- positive; however, the awareness and endorsement among those using PrEP have greatly increased since 2014. Being less than 35 years old, of middle-high income and having an urban residence were found to have increased odds of perceiving the U=U concept as completely accurate among MSM, while ever having an HIV test was found with increased odds among the general population (Torres et al., 2020). Carneiro and colleagues (2020) also found less awareness among Latinx, Asians, low-income and southern SMM; similarly, Hispanic/Latinas were found to have lower knowledge of HIV and treatments in previous studies (Enriquez et al., 2010; Flaskerud & Calvillo, 1991). This

study was the first to investigate these demographic characteristics among minority women with the U=U paradigm in this region.

Nativity. A measure of one's birth place, within or outside the U.S. (Budhwani, Hearld, & Chavez-Yenter, 2015) and could be an important predictor of health outcomes (Morales, Lara, Kington, Valdez, & Escarce, 2002) and attitudes. A large study among racial/ethnic minorities that used this measure found that nativity was associated with lower odds of lifetime major depressive disorder among foreign-born participants (Budhwani et al., 2015). A quarter of El Paso County's population is foreign-born, predominantly Mexican-American, which can impact HIV treatment knowledge and beliefs (Flaskerud & Calvillo, 1991). This measure has not been used in U=U studies before since none has assessed cultural associations with U=U beliefs.

Past experience/behaviors. Drug use and sexual risk behaviors were assessed using the subscales, the Injection-related Risk Scale and the Sexual Risk Behavior Scale consisting of 6 and 5 items, respectively, of the HIV Risk-Taking Behavior Scale (HRTBS; (α = .70; r = .86); Banducci, Hoffman, Lejuez, & Koenen, 2014; Darke et al., 1991). The scale was validated in a sample of 175 opioid users and was developed as a brief instrument to assess the HIV risk behaviors among drug users receiving treatment. Higher scores (range 0 – 55 total scale; 0-5 individual items) indicated higher levels of risk. In this tudy, the 11-item HRTBS had a higher Cronbach's value (α = 0.79). The subscales could have been used separately to find associations. Condomless anal sex with serodiscordant/unknown partners was found to be associated with increased endorsement of U=U both among HIV-positive (Kalichman et al., 2016) and negative populations, in addition to recent club drug use (Rendina & Parsons, Carneiro et al., 2020; 2018). This study sought to reveal whether similar associations are found among minority at-risk women.

Due to the limited population that the HRTBS could capture, a general SUD scale was included to identify women at risk due to other substances of abuse. The Tobacco, Alcohol, Prescription Medication, and other Substance use (TAPS) Tool (Tobacco - sensitivity 0.93 (95% CI 0.90–0.95) and specificity 0.87 (95% CI 0.85–0.89); Alcohol - sensitivity 0.74 (95% CI 0.70–0.78), specificity 0.79 (95% CI 0.76–0.81); Illicit and prescription drugs - marijuana - sensitivity 0.82 (95% CI 0.76–0.87) & sedatives – sensitivity 0.63 (95% CI 0.47–0.78), and specificity at or above 0.93) was used as a screen for SUD (McNeely et al., 2016). Spanish version (Sanchez, Gryczynski, Carswell, & Schwartz, 2020). These psychometric measures were obtained using the 1+ score cutoff for identifying problem use in a sample of 2,000 primary care patients. The SUD diagnostic power of the tool greatly increases with a score of 2+; however, it has a lower sensitivity to detect any SUD and these trends were similar in both provider and self-administered data (McNeely et al., 2016). Although the authors cautioned that the TAPS needed more refinement, perhaps through more testing in different populations, before it could be used as a general screen, the fact that it is a brief but effective instrument to identify problem substance use for all commonly used substances in a time-constrained environment made it suitable in this study. Also, the substances in this tool may be more appropriate since studies have shown that people in the El Paso region drink more alcohol compared to other parts of Texas (Editorial Staff, 2019), which is reflective of the national prevalence where almost half (48%) of alcohol users were classified as binge drinkers, which for females means having four or more drinks in a single sitting (Substance Abuse and Mental Health Services Administration, 2019). The TAPS assessed past year use and responses ranged from 0 – "Never" to 4 – "Daily or almost daily use" for the four classes of substances (McNeely et al., 2016). Reliability testing of the TAPS in this study resulted in a Cronbach's alpha of 0.69.

Perception of HIV risk. Perception of HIV risk was measured using the Perceived Risk of HIV scale (PRHS; Napper, Fisher, & Reynolds, 2012, 2012); Spanish version (Gómez-Melasio, 2021). The PRHS (Cronbach's $\alpha = 0.88$); $r = 0.91$) is an 8-item scale that measures cognitive (e.g., thinking about infection), intuitive (e.g., worrying about getting infected), and salience (e.g., mental images of getting HIV infection) of HIV risk among the minority women (Napper et al., 2012). This scale was developed among a sample of 785 diverse racial populations who were HIV-negative and was developed to address the multidimensional components of perception of HIV risk, including affective and cognitive factors in relation to behavioral outcomes. As with the HRTBS, the PRHS indicates higher perceptions of risk with an increase in the score (range = 8- 47) and discriminated between those who were engaged in high-risk behaviors and those who were not (Napper et al., 2012). Low perception of HIV risk, using a single item from the PRHS, was found to be associated with higher ratings of the U=U concept as being accurate among HIV-negative men (Rendina & Parsons, 2018). In addition, Latinos have been found to have low perceptions of HIV risk in general (Solorio, Forehand, & Simoni, 2013). Perceptions of risk could significantly influence attitudes toward U=U among minority women. Items were recoded and reversed scored according to the author's scale, and then a sum score was computed. The 8-item HRPS had a Cronbach's alpha of 0.86 in this study.

Personal prejudice. Stigma toward PLHIV was assessed using a 9-item prejudicial attitude scale (Cronbach's $\alpha = 0.75$) used in Li et al. (2007) and sourced from the *HIV/AIDS-related Stigma and Discrimination Indicators Development Workshop Report* (United States Agency for International Development, [USAID], Inter-Agency Working Group on Stigma and Discrimination,2004). For example, People who got HIV/AIDS through sex or drug use got what they deserved; AIDS is a punishment for bad behavior; People who behave promiscuously

should be blamed for AIDS; all using a 5-point scale from (1) strongly disagree to (5) strongly agree. The scale was validated among 1101 health care workers, majority female, in China and it is scored so that higher scores indicated higher levels of prejudice; some items were reverse scored. According to the theory of attitude formation, individual prejudice is one of the many personal factors that shape attitudes toward objects (Bakanauskas et al., 2020). However, this variable has not been assessed in associations with U=U or TasP studies. The reliability test of the scale in this study resulted in a high Cronbach's alpha of 0.93.

HIV treatment attitudes. The attitude scale toward HIV treatment (Holt et al., 2014) uses questions derived from the Optimism-Skepticism in the Context of HIV Treatments Scale (Van de Ven, Crawford, Kippax, Knox, & Prestage, 2000) and has two components: HIV treatment prevents transmission (Cronbach's α=0.65) and early HIV treatment is necessary (α=0.72) subscales. The questions in the first scale are: an HIV-positive person who is on HIV treatments is unlikely to transmit HIV; a person with an undetectable viral load cannot pass on HIV; if every HIV-positive person was on treatment, the HIV epidemic would be over. Items in the second scale include: people should start HIV treatment as soon as they are diagnosed; people should delay treatment until it is absolutely necessary (reverse scored); HIV-positive people should go on treatment to protect their partners (Holt et al., 2014). A Likert-type scale was used and scored from (1) strongly disagree to (5) strongly agree. A score of 4 was used as the threshold of agreeing to treatment belief items, as was done in the validation study resulting in the scale items being used as dichotomous variables (Holt et al., 2014). An early study among PLHIV found that beliefs in treatment efficacy to reduce the risk of HIV transmission were associated with engagement in condomless anal sex with a serodiscordant/unknown partner (Kalichman et al., 2016). Later, even among those who endorsed the accuracy of U=U, risk of

transmission was reported by 10% when the undetectable partner was insertive vs. 14% when receptive among individuals who believed that the U=U was completely accurate among SMM (Rendina et al., 2020). HIV treatment beliefs may also impact minority women's attitudes toward U=U. In this study, a similar reliability value was obtained for the TasP subscale (Cronbach's $\alpha = 0.69$), but lower (Cronbach's $\alpha = 0.633$) for the treatment is necessary subscale.

Mental health status. The Patient Health Questionnaire (PHQ-4; Cronbach's $\alpha = 0.85$; Kroenke et al., 2009), a brief screen for anxiety and depression, which was validated among 2,149 patients across U.S. health facilities, and resulted in percentile ranks of 93.4% and 95.2%, for PHQ-2 and GAD-2 scores of 3 respectively, 99.0% and 99.2% for scores of 5, respectively, (Löwe et al., 2010) was used to assess mental status in the past 2 weeks. Spanish version (Mills et al., 2015). The scale consists of 4 questions: In the last 2 weeks, how often have you been bothered by the following problems? 1. Feeling nervous, anxious or on edge, 2. Not being able to stop or control worrying, 3. Little interest or pleasure in doing things, and 4. Feeling down, depressed, or hopeless. Responses include not at all (0) to nearly every day (3) (Kroenke et al., 2009). The scale score (0-12 for the total scale) was summed and a cutoff of 3 on the PHQ-2 and 3 on the GAD-2 was used to denote symptoms of depression and anxiety, respectively (Löwe et al., 2010). Depression and anxiety are the two most prevalent mental health disorders among women (SAMHSA, 2020c). The association between mental health and HIV risk behavior is established, and it is known to increase HIV risk among women significantly. However, it is unclear how mental health status influences HIV treatment attitudes and U=U. None of the studies among SMM assessed mental health or depression in association with U=U. The reliability test result was the same for the PHQ-4 (Cronbach's $\alpha = 0.85$) in the current study.

Social Media Use. Participants' level of engagement on social media was assessed by a single question asking about hours spent on social media for the day. Responses ranged from less than (0) 30 minutes, (1) 30-60 minutes, (2) 1-2 hours, (3) 2-3 hours, and (4) more than 3 hours. A similar scale was used regarding how many social media sites the participant had (SurveyMonkey, n.d.), retrieved from https://www.surveymonkey.co.uk/r/99CGC3B. The impact of messages received on attitude to U=U was assessed by a single item, "To what extent do you think social media impact your attitude toward PLHIV who have an undetectable viral load?" Response scale included (0) no impact to (4) very high impact. Higher scores indicated greater social media use. Websites and social media platforms have been major vehicles for conveying the U=U message, and it is seen as an important strategy for promoting HIV prevention among MSM (Ramallo et al., 2015). Moreover, it was shown that recruitment through social networking apps, as opposed to social networking sites, had greater associations with an increased endorsement of the U=U message among this population (Rendina & Parsons, 2018). However, no associations have been shown between women and social media use regarding how it shapes their beliefs about U=U.

Quality of life. The statement "Overall, you would describe your quality of life as:" was used to assess QOL with responses from (1) poor, (2) fair, (3) good, (4) very good, and (5) excellent. A single item from the World Health Organization Quality of Life Brief Version (WHOQOL-BREF) instrument (Skevington, Lotfy, O'Connell, & Group, 2004; World Health Organization, 2004) has been validated and shown to be a reliable method for measuring QOL in many health-related and epidemiological studies using the U.S. version (Cronbach's α range: 0.82-0.95 across domains; ICC range: 0.83-0.96 at 2-week retest interval) (Bonomi, Patrick, Bushnell, & Martin, 2000) and others (Atroszko, Bagińska, Mokosińska, Sawicki, & Atroszko,

2015). Therefore, the researcher developed a similar scale where the cutoff point of 3+ was used to indicate a good QOL. This variable was an additional variable of interest to the researcher among this minority population and has not been associated with any U=U studies. It may also be a useful variable to assess in future secondary analysis of the study data.

Social determinants.

Family connectedness and family support. The Perceived Availability of Social Support Short Form Scale (F-SozU), consisting of six items (Lin, Hirschfeld, & Margraf, 2019), was used to measure social support. Items were scored on a scale of (1) not true to (5) very true and summed with a total score range of 6-30. Higher scores indicated greater levels of social support. Questions included, for example, I experience a lot of understanding and security from others; I know a very close person whose help I can always count on; If necessary, I can easily borrow something I might need from neighbors or friends (Lin et al., 2019). The brief scale was developed among 3038 representative samples from the USA (Cronbach's $\alpha = 0.89$) in addition to over 20,000 representative and student samples from China, Germany and Russia. It was found to have good psychometric properties, with Cronbach's α ranging from 0.78 in Russian representatives to 0.90 among Chinese and German students (Lin et al., 2019). This construct has not been assessed in any of the U=U studies, which focused primarily on individual-level characteristics and behavior. However, within the SEM, relationships are an important SDH (USDHHS, n.d.), and social support may also shape the attitudes of minority women toward U=U. The literature has established that treatment outcomes for women infected with HIV are affected by their roles as primary caregivers often to children (Schuster et al., 2000) and lack of or low social support may impact risk and treatment outcomes among women (Fang, Chuang, & Al-Raes, 2019), ultimately resulting in different types of needs to address HIV risk and

prevention among women, including support services (30 for 30 Campaign, 2012). Social support is often seen as a protective factor against HIV, especially among Hispanic vulnerable population (Althoff et al., 2017; Costa et al., 2017; Painter, 2018). Like QOL, social support was not assessed in previous U=U studies among MSM. However, it is an important influencing factor in health outcomes, especially among women with co-occurring disorders (Brown, Jun, Min, & Tracy, 2013), and those living with HIV (Gielen, McDonnell, Wu, O'Campo, & Faden, 2001) as well as a crucial factor that shapes attitude to HIV treatment (Misener & Sowell, 1998). In this study, the reliability of the PSS was good (Cronbach's $\alpha = 0.86$).

Proximity to someone with HIV. Family/friends with HIV was a single item, "I have family or friends that are HIV positive?" (No/Yes). Research shows that knowing someone living with HIV results in less stigmatizing attitudes toward PLHIV among 6,074 HIV-uninfected people, as well as reduced perceptions of internalized stigma among 387 PLHIV (Prati et al., 2016). Although the interaction found by knowing someone with HIV did not influence HIV testing behavior (Prati et al., 2016), it may influence attitudes toward U=U among minority women.

Violence. Interpersonal violence was measured using the Universal Violence Prevention Screening Protocol (UVPSP), which showed good positive predictive values for each of the 5 questions (range 71 – 89% on the physical scale; 75 – 92% on the non-physical scale) when compared to the Index of Spousal Abuse (ISA) scale (Heron et al., 2003). The items in the scale were validated using a sample of 200 African American women who were abused and who were receiving medical attention in an inner city emergency department for care related to a suicide attempt (50%) or other care (Heron et al., 2003). The items were scored as (0) no or (1) yes, and the authors indirectly endorsed the cutoff point of the scale as obtaining a 4 or higher on the

UVPSP since this resulted in an increased prediction of both physical (AOR 28.89; 95% CI 7.81 to 99.54) and non-physical abuse (AOR 13.15; 95% CI 3.65 to 47.38) (Heron et al., 2003). Question 2 on sexual abuse and question 3 on being threatened both had low sensitivity, and the overall sensitivity, and predictive value of the scale were not reported. The questions in the scale include: "Have you been in a relationship with a partner in the past year?" (Yes/No); If yes, within the past year has a partner:(a) "Slapped, kicked, pushed, choked, or punched you?" (b) "Forced or coerced you to have sex?" (c) "Threatened you with a knife or gun to scare or hurt you?" (d) "Made you afraid that you could be physically hurt?" and (e) "Repeatedly used words, yelled, or screamed in a way that frightened you, threatened you, put you down, or made you feel rejected?" All questions had dichotomous responses of yes/no (Heron et al., 2003, p. 486). IPV increases a woman's risk of HIV by 50%, therefore it is an important variable to assess among minority women who are susceptible to abuse and HIV risk. This factor has not been assessed in any previous study on U=U. Although the UVPS scale was not analyzed for predictive properties against a standard in this study, a reliability test of the 5-item screen showed acceptable results (Cronbach's $\alpha = 0.78$).

Access to quality health care. This variable was assessed by the following items. "Do you have a primary care provider?" (Yes/No). Satisfaction with health care at last encounter (i.e., how satisfied were you with your primary care provider (PCP)?" (0) Not at all satisfied to (5) extremely satisfied. Relationship with primary care provider (PCP), i.e., comfortable discussing with PCPs their sexual health/HIV concerns (1) strongly disagree to (5) strongly agree. How long is your commute to your PCP? 1 - <30 mins, 2 – 30-59 minutes, 3 – 60+mins (Okoli et al., 2020). More PLHIV who had less than 30 minutes commute time to their HCP had conversations with their HCP about U=U and were aware of the benefits of treatment in

preventing transmission of HIV (Okoli et al., 2020). Access to and quality of health care are important SDH. The patient-provider relationship is a good indicator of perceived quality of health care, which could be a direct influence on attitudes toward U=U, as was seen in earlier studies regarding treatment (Lain, Valverde, & Frehill, 2007; Sowell et al., 1999). Women who trusted their HCP were more likely to take their medications compared to those who expressed distrust. This study examined whether there was an association between PCP relationship and commute to PCP with attitude to U=U.

Social norms. Stigma toward PLHIV was assessed by asking the following questions: "Most people would not buy vegetables from a shopkeeper or food seller that they knew had AIDS" (Genberg et al., 2008), with scale responses modified for survey response consistency (1) strongly disagree to (5) strongly agree. WLHIV have generally high perceptions of HIV-related stigma and community-wide stigma was shown to be prevalent in the U.S. (30 for 30 Campaign, 2012), with more than three-quarters of participants in the American Foundation for AIDS Research (amFAR) survey of Americans disagreeing to some degree that WLHIV should have children and one third expressed this view despite the fact that ART prevents mother-to-child HIV transmission (American Foundation for AIDS Research, 2008). A recent study highlighted the fact that stigmatizing beliefs are prevalent, with over half of Americans expressing feelings of discomfort around an HCP who is HIV-positive (Gay & Lesbian Alliance Against Defamation, Gilead., & Compass Intitiative, 2020). Community stigma continues to be a barrier to HIV treatment for women (30 for 30 Campaign, 2012; Geter, Sutton, & Hubbard McCree, 2018), and it remains a critical factor in investigating how it influences women's attitudes to U=U. Moreover, only 17.2% of the general population in Brazil endorsed the accuracy of the U=U concept and the only variable that was found in association with acceptance among this

population was ever having an HIV test (Torres et al., 2020). Although community stigma toward PLHIV was not assessed in these studies, it is a major SDH with regard to HIV at all levels of the continuum of care. Social norm about trusting U=U, was investigated through questions such as "Most people in the community (parents, siblings, friends etc.…) will trust that undetectable HIV load is untransmittable, that is if the HIV virus is not seen/detected in the blood of an HIV positive person, it cannot be passed on to another person," with scale responses from (1) strongly disagree to (5) strongly agree. As was seen in a qualitative study in Kenya, beliefs among community members can influence biomedical prevention uptake by women (Bazzi et al., 2018), thus it was relevant to look into whether these same types of barriers exist in this border region to the U=U concept.

Beliefs about sexual risk behavior among PLHIV under U=U were investigated with the item "People living with HIV and have an undetectable viral load will engage in sexual risky behaviors such as having multiple partners, unprotected sex and unprotected sex under the influence of alcohol/drugs," with responses from strongly disagree (1) to strongly agree (5). As was revealed in one study, increased RSBs among PLHIV with the widespread awareness and acceptance of U=U was one concern for medical providers (Ngure et al., 2020), and this has been the outcome as evidenced by some studies among PLHIV (Kalichman et al., 2016; Rendina & Parsons, 2018). However, community-level beliefs about U=U have not been explored. Cultural norm was evaluated with the question "Most people in my culture think that HIV treatment is effective (i.e., makes PLHIV healthier)," (1) strongly disagree to (5) strongly agree. Early studies about attitudes to HIV treatment found that cultural norms and beliefs greatly influenced what women knew and thought about HIV transmission and treatment (Flaskerud & Calvillo, 1991). The community-based questions were formatted similarly to those found in the

questionnaire on community attitudes about values, shame, and blame toward PLHIV in Tanzania (TSFTG, 2005).

Neighborhood. This included single-item questions asking about cohesiveness, violence/crime and access to transportation in the participants' neighborhood. For example, using a scale from (1) strongly disagree to (5) strongly agree, "People in this neighborhood can be trusted," "People in this neighborhood are afraid to go out at night due to violence," adapted from the SHAPES 2006 survey as cited in (MDPHP, 2010). "Public transportation is easily accessed in this neighborhood." The Spanish version was provided by the Hennepin County Human Services and Public Health Department. The built environment is another influential SDH (USDHHS, n.d.). Studies have found that those having an HCP in metro areas were more aware of U=U (Okoli et al., 2020), and those living in metro areas were found to endorse greater beliefs in U=U (Torres et al., 2020). Although none of the U=U studies queried community violence and safety, previous studies that looked at health outcomes among minority communities found that there were associations with poorer health outcomes among those from certain disadvantaged communities (Latkin et al., 2013; Ransome et al., 2016). In a study evaluating the relationship of late HIV diagnosis with economic disadvantage and Black racial concentration using data from 1748 cases of late HIV diagnosis for the period 2009 – 2010, provided by the New York Department of Health and Mental Hygiene, spanning 174 residential ZIP codes found that among the neighborhoods with the highest income inequalities there were higher rates of late HIV diagnosis, a higher index of socioeconomic deprivation and higher concentration of Black race (Ransome et al., 2016). In addition, the risk for women was increased (RR=5.37; 95%; CI=3.16, 10.43) in neighborhoods that had a high concentration of Black race when the other variables were controlled (Ransome et al., 2016). Disadvantaged

neighborhoods tend to gravitate toward higher levels of social disorder, evidenced by abandoned buildings, crime, graffiti etc., all of which are measurable through self-report (Latkin et al., 2013). Experiences in the environments where people live and grow influence their attitudes toward health behaviors (Ajzen & Fishbein, 2005; Bakanauskas et al., 2020). Thus, this variable was beneficial to understand minority women's attitudes toward U=U.

Data Management

Data collection. Interviews were conducted with the researcher and participant in a private setting via Zoom or in person. Asemi-structured questionnaire was used as a study guide to collect qualitative data during interviews. Audio only was recorded with a Philips voice recorder (Philips VoiceTracer DVT 6010) and uploaded into a password protected computer in a secured office. Surveys were used to collect quantitative data on paper for in-person or electronically for online participants. They were self-completed by participants with assistance where needed for Spanish language translation since 14 in-person surveys were done in Spanish. Completed surveys were immediately placed in a brown cardboard box, and the box was closed. The audio recorder was kept locked in a file cabinet along with survey instruments. Consent forms were kept separate from survey instruments in the secured cabinet until data entry and analysis.

Data cleaning and handling. Audio recordings were transcribed verbatim using NVivo (released in March 2020; QSR International Pty Ltd, 2020), and completed files were exported and stored as a Microsoft Word document where they were spell-checked. Online Question Pro surveys were downloaded and cleaned for location (Texas surveys only) and completeness. Surveys that had more than 50% data missing were excluded. Online ID, email, location, time stamp, date, instructions, empty variable columns and other irrelevant information were

removed. Participants were assigned a new ID by the researcher. A total of 82 online surveys remained, while 78 provided an email address. The final cleaned online file was then used to input paper survey data. Four paper surveys were excluded due to participants identifying as White-non-Hispanic, leaving 67 eligible paper surveys. All data were entered even if participants answered questions that were supposed to be skipped based on previous questions. No response was recorded for scale items that had more than one response. The completed dataset was checked for errors by performing frequency checks and reviewing minimum and maximum values as well as missing data analysis. Participants were further excluded from the data set if they had all variables missing for each scale used in the study and if they were missing the outcome variable. This resulted in an additional 15 participants being excluded resulting in a small sample size (n = 134). Two variables had greater than 10% missing, income (11.8%) and a scale variable (HRPS9 - 10.4%). Some authors argue that a missing rate as high as 10% is acceptable, especially in fields like psychology and education, where the rate of missing is usually higher (Bennett, 2001; Dong & Peng, 2013). Moreover, income was somewhat dependent on employment status. Conditional skipped items, as expected, had a higher proportion of missing data, with a range of 15.4 -85.9% missing. The data were determined to be Missing Not at Random (MNAR) based on Little's MCAR test ($p < 0.00$), including and excluding all the true conditional variables such as HIV_ART (Little, 1988). Although multiple imputation (MI) is the most widely recommended method for handling missing data that are MNAR — "Multiple imputation can handle both MAR and MNAR" (van Buuren, 2018 p. 37) — non-normal distributed variables within the dataset would require the use of the predictive mean matching (PPM) method for MI, but this method does not support MNAR data as described by van Burren (2018). The cause of the missing data cannot be completely ascertained

as external factors may also influence the missing data (van Buuren, 2018). Moreover, many researchers argue that there are no satisfactory methods for addressing MNAR data and recommend complete case analysis (Jakobsen, Gluud, Wetterslev, & Winkel, 2017).

Variables were recoded, for example, the TAPS, and reversed coded, for example, the HRPS, according to specification for their use in scales and according to literature and instructions, except the ATTPLWHA5 and the NBRHD9-13 variables since these were to use a 4-point scale but for consistency within the survey a 5-point scale was used which included a neutral option (See Appendix I for coded variables). Outcome variables were recoded to produce binary responses. Independent variables that used psychometric scale data were set as categorical (where specified), ordinal or scale if they were required to compute a total score. Computation of some scale scores required that cases were recoded to follow the logic of the scale scoring since some included responses for items that were supposed to be skipped based on answers to the previous question. For example, the HRTBS items 11-14 and 16-20 were to be skipped if items 10 and 15 were answered as "none," respectively. Therefore, these items were coded to follow the logic if "none" was chosen for HTRBS 10 and 15, then HRTBS11-14 and HRTBS 16-20 were coded as "zero" for a total score of zero following the developer's instructions (Darke et al., 1991). This logic recoding was also done for the UVPS9 stem question and subsequent answers for 9A-9E. This also greatly reduced the amount of missing data for these items and removed misaligned responses. Once the data were coded correctly, the variables were analyzed. Dummy variables for race, marital status, education, religion, and sexual orientation were created for the regression analysis. Analysis of data proceeded according to specific aims.

Data Analysis

The qualitative and quantitative data were analyzed following theoretical methods that are appropriate for each type of analysis. Quantitative data analyses were done using SPSS version 26.0 (IBM Corp, 2019). Data analysis strategies are discussed according to the specific aims below.

1. **To identify minority women's awareness of and attitudes toward undetectable equals untransmittable (U=U).** Exploring and identifying attitudes to U=U within the social-ecological framework provided a rich insight into how women thought and felt about U=U in relation to individual and sociocultural factors, adding to the scant body of literature about attitudes and U=U among this population. Using a semi-structured interview allowed for in-depth beliefs to be captured, adding to the richness of the data. **Thematic analysis**. All interviews were conducted in English; therefore, there was no need to translate from Spanish to English. Interviews were transcribed and coded using NVivo software (version 12), and thematic analysis was done following the steps outlined by Braun & Clarke (2006) and depicted in Figure 1. This method is regarded as one of the most used in qualitative data analysis (Clarke & Braun, 2017; Kiger & Varpio, 2020), using common statements to identify major themes derived from the women's perspectives across all interviews/data (Creswell, 2014).

Figure 1: Phases of Thematic Analysis.

Phase 1. The researcher actively listened to and transcribed all interviews. This process helped with the familiarization of the data and also helped to identify noteworthy patterns

in the data. The researcher also reread the transcripts while checking and fixing spelling and grammatical errors.

Phase 2. The researcher hand-coded all transcripts with the assistance of the qualitative computer data analysis program NVivo (released in March 2020). The transcripts were read and reread thoroughly, and the data were "winnowed" with sentences and chunks of paragraphs coded with *in vivo* terms from transcripts (Creswell, 2014) using an inductive coding framework (Attride-Stirling, 2001). The coding was systematic, with similar constructs throughout the entire data set assigned to the same code (Braun & Clarke, 2006), and the codes were labeled with short descriptions. The data were then reviewed under each code and removed and recoded where needed. Memos were also written in this phase to assist with the derivation of themes in the next phase.

Phase 3. The codes were then grouped according to the domains of the semi-structured survey and were carefully reread and analyzed to identify "underlying patterns and structures" to derive salient themes (Attride-Stirling, 2001). A data analysis map was used to develop emerging themes.

Phase 4. The themes were reviewed and defined further to ensure that each was distinct and all data within them were relevant and coherent (Braun & Clarke, 2006). The data extracts were reread under each theme and were removed or recoded where needed. A thematic map also helped to satisfy the second requirement of this phase which was to ensure that all the themes were meaningful and accurately representative of all the data with little or no overlap between them.

Stage 5. In this stage, the themes were defined and named, and the extracts that captured the essence of the theme were identified to highlight the meaning of the theme and its

contribution to the overall qualitative inquiry and analysis (Braun & Clarke, 2006). Some themes and subthemes were identified in this stage. The names of the themes described and reflected their content.

Phase 6. This stage really started with the earlier stages of the thematic analysis process (Kiger & Varpio, 2020), with identifying codes and assigning extracts and developing themes. In this stage, the themes were interpreted and brought together logically and coherently to answer the research question regarding minority women's attitudes toward the U equals U concept. The themes were further analyzed and justified through the use of meaningful and relevant extracts (Braun & Clarke, 2012) to support the overall narrative and interpretation.

Validity. Thematic analysis has been supported as a fundamental qualitative analytical method (Braun & Clarke, 2006) as well as a flexible approach that is adaptable to many theoretical and philosophical frameworks (Kiger & Varpio, 2020). The six-step analytical process described is one form of method validation that supports the construct of sound themes and findings and increases the trustworthiness of the results (Roberts, Dowell & Nie, 2019). However, further validation is needed to ensure that the data is true and believable and is constructed by the researcher and the participant throughout the study (Zohrabi, 2013) and may be presented through the lens of the researcher, the participants or the readers (Creswell & Miller, 2000). Two methods of internal validity were employed, the researcher's bias/reflexivity and triangulation. Although these may be utilized within specific epistemological facets such as the critical paradigm and postpositivist paradigm (Creswell & Miller, 2000), the pragmatic philosophical approach of this study allowed for the utilization of any relevant method to answer the research

question (Creswell, 2014). The researcher's bias provides transparency to her assumptions, beliefs and experiences — as influenced by her nationality, culture, identity as a minority woman, and SES — and gives the reader an opportunity to recognize how this shapes the qualitative inquiry and allows them to suspend these biases going forward (Creswell, 2014; Creswell & Miller, 2000). This is also referred to as bracketing (Moustakas, 1994).

Triangulation was also used as a validity measure, which is suited for this researcher-validated study (Creswell & Miller, 2000) but can also be utilized as a reliability tool concerned with the consistency, dependability and reproducibility of the results (Zohrabi, 2013). Triangulation as a validation method can be accomplished through the utilization of different sources of information, such as participants or investigators or through different methods, such as questionnaires and interviews, to provide strong support for themes and interpretations (Creswell & Miller, 2000). Internal validity of the qualitative data was achieved by triangulation with the quantitative data and literature, which used a similar approach to explore women's attitudes toward treatment. External validity of the study would be dependent on whether the findings could be applicable or generalizable to other populations in other settings, which may be difficult to ascertain (Nowell, Norris, White, & Moules, 2017) and/or limited due to lack of similarities between people and setting (Zohrabi, 2013). External reliability was derived through the use of multiple forms of data collection and analysis (Zohrabi, 2013). Finally, the implications and future directions are discussed as a final interpretation and analysis by comparing themes derived from the interviews with the survey data (Creswell, 2014) on attitudes and determinants.

2. **To assess the proportion of at-risk minority women who are aware of U=U.**

   Awareness is important for health literacy and engagement in health promotion and disease prevention activities.

   Hypothesis- The level of awareness of U=U will be low among at-risk minority women (Carneiro et al., 2020).

   Descriptive analysis. Proportion of participants who were aware of U=U responded "yes" to having heard of U=U prior to the study. Descriptive data were gathered by conducting a frequency analysis of all variables in SPSS.

3. **To assess the relationship of social-ecological factors (individual, interpersonal, organizational and community) with attitudes and beliefs toward the U=U message among minority women.** Understanding how factors at all levels within the SEM, including social determinants of health, impact minority women's attitude to U=U is critical to addressing the factors that lead to poorer treatment and health outcomes.

   Hypotheses – 1) Factors at all levels of the SEM will associate with the attitude outcomes. 2) Community-level factors will have a stronger association with attitudes toward the accuracy of U=U (Bazzi et al., 2018; Misener & Sowell, 1998). 3) Individual factors will have a stronger association with sexual behavior and perceptions of HIV risk in the context of U=U (Rendina & Parsons, 2018).

   Descriptive analyses. Demographic data and all outcome variables are presented with appropriate descriptive statistics such as frequency and proportions for categorical data and means, SD, median, IQR and total scores for numerical or ordinal data.

   Bivariate analyses. Bivariate analyses such as Pearson's Chi-Square test, Likelihood Ratio test, Fisher's Exact test and Mann-Whitney U test were conducted. The outcome

variables (attitude toward U=U, i.e., trusts the accuracy of U=U (yes/no); perceived risk of HIV in the context of U=U (yes/no); perceived risk of HIV behaviors in PLHIV (yes/no) were ordinal variables initially since they utilized a Likert type response scale but were recoded into binary variables. A *p*-value of 0.05 and below was considered significant for all test analyses.

Inferential analyses. Logistic regression was conducted for the attitude outcome variables (i.e., belief in the accuracy of U=U (yes/no); sexual behavior in the context of U=U (yes/no); perceived risk of HIV in the context of U=U (yes/no); for individual, HIV-related, attitudes, and community variables for a total of 12 logistic regression models identifying factors associated with positive versus negative attitudes.

4. **To compare and contrast qualitative themes and quantitative findings of attitudes toward U=U among minority women.**

   Triangulation of different types of data is one way to ensure validity in qualitative inquiry in addition to researcher reflexivity (Creswell & Miller, 2000). It was expected that the themes from interview data will reflect closely the results of the survey data in regards to attitudes toward U = U.

   Analyses. The results from the qualitative analysis, the themes, were compared with the results of the descriptive, bivariate and logistic regression analysis results to determine if the thematic attitudes and related factors are similar or different from the attitudes outcomes and predictors in the quantitative portion.

Protection of research participants and subjects

The study was approved by the Institution Review Board (IRB) at the University of Texas at El Paso (UTEP) [Protocol #: 1783017-1]. Participant recruitment and online data

collection commenced online and in person upon IRB approval. All participants gave written consent to participate in all research activities and were reminded that it is a voluntary activity and they can withdraw at any time. They were also given the researcher's contact information if they had questions or needed clarifications. Additionally, interview participants also gave their verbal consent to be recorded before sessions started. Interviews occurred in a private environment at CBO facilities or via Zoom based on participants' preference or due to COVID-19 restrictions. Question Pro, a UTEP-provided and secured platform for survey data collection, was used. No identifying information was collected on survey instruments or during the interview. Online survey participants optionally provided their email addresses at the end to receive their electronic gift card incentives, and the emails were deleted from data files used for analysis and kept separate for grant reporting purposes. All study materials were kept in a secured room and stored in locked cabinets until data entry and analysis. Only the researcher and research assistants managed the data. No identifying information was or will be included in published or unpublished reports.

CHAPTER IV – RESULTS

The results of the qualitative and quantitative data are presented according to the specific aims below. However, to meet the validity requirements for the qualitative part of the study, the researcher's experience will be discussed first to preface the results. Such reflective practice is one way to validate the findings of qualitative data in a thematic analysis in order to give the audience/readers an opportunity to assess the researcher's background, the participant's perspectives and the researcher's interpretation of the findings. The qualitative data will be further validated by triangulation with the survey data.

Researcher's Reflection

Credibility, transferability and dependability are concepts used to establish validity and rigor in qualitative research (Guba & Lincoln, 1989). The reflexivity of the researcher in disclosing beliefs, assumptions, positionality and historical background and how these shape the research process, the researcher being integral to the process, is one way to establish validity and rigor in health research (Bradbury-Jones, 2007) and doing so explicitly unfolds the subjectivity and authenticity of the study (Bradbury-Jones, 2007; Peshkin, 1988). Therefore, I reflect on my experiences in the research process using the first-person voice. I will discuss and critique my experience as I recall them, as some researchers indicate that the reflection format is flexible (Kleinsasser, 2000).

As a researcher, I would be considered an "outsider," "outside expert," or "professional stranger" (Eng et al., 2013 p. 160; Minkler & Wallerstein, 2003) coming into the El Paso community since my career and educational backgrounds were different from most members of the community (Duran et al., 2013). As an "Outsider," I felt inadequate in my knowledge about the people, culture, language, past research-related abuses in the Latino community, and key

stakeholders in the field of HIV prevention and advocacy, which I felt would jeopardize building trust (D'Alonzo, 2010; Duran et al., 2013). To overcome these obstacles, my mentor and bilingual co-workers in the Minority AIDS Research Center at UTEP, trained in public health research, were the helpful "insiders" who played a critical role in reaching out to administrators of academic-community partner CBOs to gain approval to conduct study recruitment at their facilities and to get the "ball" rolling for my study. Working with a partner who is an "Insider" was according to best practice (D'Alonzo, 2010) as an "outsider."

Even with these resources, there were many unsuccessful attempts to gain approval from CBOs for both parts of the study. The recruitment process was frustrating and discouraging at times. I became hesitant to contact the CBOs to ask for their help in disseminating the research information after one of the managers explained her situation of being the only administrator at the facility and being understaffed due to COVID-19. Their staff, schedule, and time challenges restricted them from being able to recruit participants on my behalf. Luckily, I was welcomed to return and conduct recruitment on my own. Then it was clear to me that this must have been the reason why other organizations were not responding as I had expected. Due to this, I had to amend my requests to CBO managers to reflect my willingness to physically go to the sites, present the study, and recruit participants.

Once I got a "foot in the door," the women were generally willing to participate, and some were very eager and generous with sharing their experiences, a pleasant surprise to me. A total of 21 participants partook in the qualitative and 134 participants were included in the quantitative analysis. Many interviewees discussed their experiences with HIV/AIDS vicariously through close family members or friends, something that I could relate to as I, too, share similar experiences ushering me into an "insider" view, if only briefly, in the research process. Those

brief episodes of an *emic* view (insider's) greatly enhanced my confidence throughout the interview. Other researchers have described similar occurrences of having both an insider and an outsider perspective, depending on the topic discussed, within the same research process — a unique opportunity to connect with the researched (Berger, 2015).

Despite these great experiences, as a researcher, I faced multiple obstacles and had to constantly remember why I wanted to engage in this type of research. I am from a small country that consistently had one of the highest rates of HIV in Central America for many years. I would like to believe that a message of hope and longevity through medication adherence, and elimination of stigma, would be worth it to enhance health outcomes for high-risk individuals and PLHIV. My desire to learn more about the social factors and their influence on HIV risk and prevention was fueled by the knowledge I gained in the Public Health field during my doctoral training. As I reviewed the literature regarding the concept of U equals U, I noticed that minority women's voices were not represented on this topic. I then thought that this would be a meaningful contribution to this area of HIV prevention research. The women in the study also expressed their gratitude for having their voices heard. I appreciate the experiences and lessons learned in conducting this study, which added to my development as a community-engaged researcher.

Qualitative Interview Data Analysis

A total of 21 women completed the interview, all in English language. More than half of the interviews (61.9%) were done in person, and 38.1% or 6 were done online. The mean length of time of the interviews was 29.9 minutes (SD = 4.79 minutes). Majority of the interviewees were from SUD CBOs, while the others were from women's shelters and the community (See Table 1).

Demographics of interview participants. The majority (66.7%) identified as Hispanic/Latino, followed by Black race (19%), biracial (9.5%) and other (4.8%). They had a median age of 30.0 years (IQR = 26.50, 35.00) with 2.29 (SD = 2.10) average number of children. All the women who participated in the interview were unemployed except for one (4.8%) who was employed full-time. Approximately two-thirds (61.9%) had completed high school or a lower level of education. Most of the women were born in the U.S. (85%) with a median of 6.5 years (IQR = 2.50, 6.5) of residence in the U.S. among those born outside of the U.S (See Table 2). More than half had a mental health diagnosis (52.4%) which included anxiety, attention deficit disorder, bipolar disorder, depression, posttraumatic stress disorder (PTSD) and Schizophrenia, and one indicated that she was undergoing evaluation. One (4.8%) indicated that she was HIV -positive, and none of the women had ever taken Pre-exposure Prophylactic (PrEP) medication. A quarter of the women (23.8%) reported experiencing intimate partner violence (IPV), i.e., slapped, kicked, punched etc. in the last month. Less than half (47.6%) knew someone personally who has HIV/AIDS, and even fewer (28.6%) knew someone who had died of AIDS (See Table 3).

Thematic analysis. The transcripts were coded and then grouped by four broad categories of inquiry: 1) perceptions of HIV risk, 2) attitudes toward PLHIV, 3) attitudes toward HIV treatment, and 4) awareness and attitudes towards U equals U. The codes were then reviewed to find emerging themes for each domain. General patterns for the main questions are summarized in Table 4, and the emergent themes derived for each domain are displayed in the data analysis map (Table 5). The emergent themes were then condensed into five major themes across all the domains. They are: 1) Awareness of U equals U and HIV-related issues, 2) Unawareness, lack of knowledge, and misconceptions of U equals U and HIV-related issues, 3)

Discrepancy between beliefs, perceptions and behaviors regarding U equals U and HIV risk, 4) Positive attitudes toward U equals U and PLHIV, and 5) Stigma, fear and discrimination related to U equals U. They are discussed in order below.

Theme 1: Awareness of U equals U and HIV-related issues. Only five (23.8%) of the participants reported that they had heard of the phrase undetectable equals untransmittable (U equals U) prior to the study, and only seven (33.3%) had an accurate idea of what the phrase meant. Among the participants who were aware of the phrase, two had a Master's degree, one a Bachelor's degree, one an Associate's degree and one had a high school education. They heard the phrase from different sources. Participant 8 indicated that she learned of it from the CBO where she was residing. "Yes, only recently in this program," she responded when asked if she had heard of the phrase undetectable equals untransmittable before. She proceeded to explain, "… they say [referring to facility affiliates] they can get it down so low to where it's like, if you take the medicine, they get it down so low to where it's undetectable." Participant 11, who was the only reported HIV-positive individual, said, "I read it in a magazine, the HIV magazine at the Infectious Doctor's office." Participant 14 mentioned the "U equals U" before being asked about it specifically. She said, "I believe everything's at a good level now, especially since we have U equals U," in her answer regarding HIV treatment beliefs. "We know that when somebody reaches an undetectable viral load, then it's not, they're at a less risk of passing HIV unto others," she continued to say. This participant may have come to this awareness of U equals U through her education or employment since she had a Master's degree and stated that she had gained more understanding of HIV over the years. The other participant, #16, who reported knowing about U equals U, also had a Master's degree and was born in Africa. She shared that she read stories of "people sharing, like, that experience … they're able to have kids and not,

like, transmit it to the other kids." The fifth participant, #17, also learned about U equals U by reading articles from online sources such as HIV.gov and from conferences, although she did not specify which type of conference. Participant 12, a 40-year-old, at first recounted that she heard about the phrase in middle school and high school, "when I was going to middle school, I heard about it in health class." However, when I explained that the phrase was rather new and started to circulate around 2016, she then confirmed that she had not heard the phrase before.

Unlike the low awareness of U equals U, all the participants, whether they perceived their risk for acquiring HIV to be low or high, were aware of some of the risk factors/behaviors and routes of transmission for HIV, sexual risks being most prevalent in the discussions. For example, participant 20 said, "I'm smart enough to know that it's a sexually transmitted disease, you know." Participant 10 said, "I think it is with sexual, like when you have different partners," when asked about her perceptions of her risk for HIV. The majority of the women knew the risk was higher with having multiple sexual partners, but they often referred to their partners as the source of this increased risk, while a couple acknowledged their own promiscuity or involvement with sex work. Participant 6 lamented, "All you know is what you are doing, and it's scary to know that there's cheaters out there that don't even take, think about that." Participant 8, "Because he was not always faithful to me." Participant 5 contributed, "Especially now, there are a lot of men and women they, they're not into the long-term relationship anymore. It's more like sex and until I see you again. They meet for sex nowadays." Participant 10 also identified that lack of protection also increased her risk and "… you don't know what your other partner or the other person has and you just keep on changing and changing partners every time without protection…." Some of the women did not use the word "I" when speaking about their HIV risk; they often used the second- or third-person voice, as if they did not want to take responsibility or

acknowledge their risky behaviors. Participant 11 was straight forward, "I did a lot of promiscuous stuff." and "I used to not have safe sex." Also, participant 18 said, "Yes, in the past, in the past I had to sell my body …. Never careful. Not using condoms." and participant 19, "I wasn't an IV drug user, but I was prostituting myself unprotected." Participant 20 also stated, "Yeah, well, in my active addiction, and I was really promiscuous."

Some knew that substance use was a risk factor for acquiring HIV. For example, participant 4 said, "I did realize that when we are under the influence that, we're not really focused on being safe or who we're having intercourse with." and participant 12 said, "You're exposed to a lot of drugs, a lot of alcohol. You're exposed to even sex trafficking." IDU was seen as putting them at higher risk. Participant 1 stated, "Well, I know the higher, like, there's a higher chance of getting HIV if you inject drugs, so that's something that I would never do. Like I would never inject myself." "… I do take drugs. I do, you know, some of them do involve injection. And it does. It does scare me." Admitted participant 21. Participant 5 was clear that any drug injected or not increased your risk. She said, "Yes, I feel that while we're under the influence of anything, alcohol or drugs, we are more at risk. Either drugs that are injected into the veins [or not]." Others described the possibility of getting infected through other types of exposed blood, such as shared shavers, by participant 2, while participants 7 and 17 mentioned getting tattoos and participants 12 and 15 talked about getting blood transfusions. Participant 15 talked about the possibility of vertical transmission from mother to child, while participant 16 alluded to it but from the standpoint that it has been prevented through adherence to medication.

Theme 2: Unawareness, lack of knowledge, and misconceptions of U equals U and HIV-related issues. Majority of the women (76.2%) were unaware of the U equals U phrase or concept. When asked to share what they think it means, some outright said they did not know or

gave some way off answers or the opposite of what the phrase means. For example, participant 10 replied, "It's when you have a partner, so he, if he has HIV, he could pass it on to me by having sexual relationships." when asked about what she thought the phrase meant. Participant 12 said, "It means you could get AIDS. You could get HIV." While participant 13 thought it meant that "You can't be affected unless you have intercourse with them." Participant 15 thought that it was an outward physical feature, "… like showing symptoms, signs and symptoms of a particular disease. So, looking at somebody who has HIV probably looks strong and youthful … looking at the person, you can't really detect that this person has HIV." Participant 5 also shared a similar thought on the meaning of the phrase. A few of the responses did not make sense, like that of participant 18, "So, they're saying that is, if it's not talked about, then it's undetectable and untransmittable." Participant 2 shared, "Like safe requirements. Safe everything about HIV…. Like rules, basically." Even those who had heard of the phrase before through reading articles could not fully describe what they phrase meant, except for one – participant 16. Moreover, even after I explained the concept, some women had difficulty grasping and explaining their beliefs given the premise of the phrase.

Unawareness of HIV risk factors and behaviors was evident among some participants who did not connect their SUD as a risk factor for acquiring HIV. Some said that they have never used needles. "Well, I know the higher, like, there's a higher chance of getting HIV if you inject drugs, so that's something I would never touch. Like I would never inject myself." said participant 1. She was asked whether she thinks other substances put her at risk, and she replied, "No, I don't think so. I think it would be just injecting." Another said, "Not sharing any needles. I haven't done needles in a while." The only HIV-positive participant, a 59-year-old Hispanic woman who has been living with her diagnosis for about two years, exclaimed, "I've

never IV'ed. I've never IV'ed." And later shared that the thought of getting HIV never crossed her mind when she was engaging in these risky behaviors. "No, not really. I thought about STDs. You know, I mean just STDs. But HIV, for some reason, I just never thought about it."

The women were also not aware that their experience of IPV in their relationship was a risk factor for HIV. The five participants who reported experiencing IPV stated: 1) "I am at risk … Especially now, there a lot of men and women, they're not into the long-term relationships anymore. It's more like sex and until I see you again," 2) "Right now I have no risk cause I'm not having intercourse," 3) "Low risk … Because whenever I have a partner I use protection," 4) "I don't believe I'm at risk, a lot [I] guess. I don't really drink, … party, … or go clubbing…," and 5) "… but now I do have a little like, clear mind now that I'm sober. I have a more clear mind of the risks, you know, and you know, it could happen to anyone," when asked about their perceived HIV risk. Most women connected having multiple partners or unprotected sex as the primary risk factor for HIV but not IPV. Neither were they aware of the risk that their mental health posed since none of the women discussed these issues regarding HIV risk perceptions nor any at all throughout the interview.

Lack of knowledge was also a common thread in the discussion regarding U equals U and HIV-related issues such as HIV treatment. The majority of the women, 13 (61.9%), cited lack of knowledge or lack of education or a need for more knowledge and education as the main reason that U equals U would not be accepted by family and community members, more than cultural or religious reasons. Participant 20 referred to the prevalence of ignorance, a term, and its variations, that she used quite a lot in the interview, in the region, "Because, like I said, a lot of older generations are really naïve, really ignorant when it comes to this disease. … Mexicans, you know, they're really ignorant, some of em, not all of em. … There's a lot of ignorance here

in El Paso." Participant 16 said, "… it's based on the information that we are exposed to, right. … chances are you won't even know it exists, you know." She later disclosed that she believes that HIV "it's more like a forgotten" disease. Participant 4 shared similar views, "I mean, I guess if they're naïve to the subject, they would definitely not understand, … so maybe lack of knowledge." As for treatment, 11 (52%) indicated that they do not know about HIV treatments. Participant 1 said, "I really don't know what the treatment does…" later in the conversation, she added, "I guess most Hispanics don't believe in treatments and stuff like that, you know." Participant 6 said, "I don't know a lot about it." "I don't know to the extent of like, the, how much medication they have to take or for how long they have to take it." said participant 17.

Subtheme – Misconceptions. Besides unawareness and lack of knowledge, misconceptions about U equals U and HIV topics were also prevalent. One of the most shared misconceptions regarding U equals U and HIV include: still being able to transmit the virus as expressed by all the women, routes of transmission of the virus, medication being a "cure" or causing adverse side effects, and government conspiracies regarding the medication. For instance, although participant 17 knew about the phrase and what it implies, she explained, "From what I heard, that you still have to follow like, procedures like using condoms and stuff. … But the chance is still there, but if they're taking the medication, it's a lot lower transmitting the virus." Participant 5 said, "I wouldn't still trust it. I wouldn't because it, it's just the simple fact of it being HIV."

Misconceptions about HIV transmission included beliefs that it could be shared by spoons, towels, makeup, and sharing pipes – saliva by a small number (4) of participants. Participant 2 said, "… so my mom would always tell me, the spoon that he's using, right, the shavers that he use there, please throw them into the trash or where the kids can't touch it, or we

can't touch it." describing the attitude toward a close relative suspected of having HIV due to drug use. She also shared that her risk is higher for HIV because "I have friends everywhere. And I am very like, oh yeah, you can use my mascara." Participant 6 asserted, "I don't use nobody else's stuff. … Like straws, pipes, smoking out of somebody else's joint or blunt or sharing a beer." when discussing why she thought her risk was low to contract HIV. Participant 19 recalled, "I was like, you know, saliva … when you drink … saliva is still there, so I guess there is a possibility …," describing an occasion that an HIV positive family member asked her for a sip of her drink on a park outing. Participant 11, who is HIV positive, said, "I mean, like with little kids, I don't let them drink out of my cups …." Others said they simply do not share other people's utensils. "I mean, I don't share with my family now, so I wouldn't do that with anyone else." participant 13; or they would "take precautions not to be close too much…," participant 10; "I would just have to be more careful." participant 18.

Conspiracies about a cure were expressed by participant 3, "So that was my belief that they should already have a cure." and participant 13 said, "There's been a lot of people that been getting killed though just because they're letting out the truth of medicines that they're or cures that they're finding for horrible diseases because that's just the way life is. … it just really depends on how the government's feeling at the moment." She continued to say, "I mean, there's a lot a things that the government hides, and I believe that that's one of them." referring to an existing cure for HIV. Participant 18 also said, "I just think it's what they believe in the government, how the government is running it. … proving that government is not really trying." Participant 2 asserted, "… I believe there is a cure for AIDS. … I mean, people don't want to say it, but I believe that they have a cure for HIV." Later she jokingly commented, "The system, just kidding, the system." Then she asked, "I'm not going to get killed by this, right?" when

asked about what might prevent the promotion of U equals U in the El Paso region. This participant also believed that the U equals U concept means that HIV is cured, "They don't want to believe that there is a cure." which was her response to why some people might reject the concept of U equals U in the community.

A part from the conspiracies surrounding a cure for HIV, a few of the women also had some misconstrued concepts about the effects of HIV treatment on the body. Participant 21 described it as, "… sometimes to me medication like pills or vaccines or anything like that, sometimes it can make it worst. It can make it go faster." referring to the progression of HIV illness. Participant 18 believed that the medication destroys the individual's body, "… it destroys the body … it destroys their immune system … it destroys their health. And it just destroys everything…." Participant 12 recounted that "… they start getting weaker and weaker with so much medication … and I saw my cousin that he ended up really dark complected [complexion]." clarifying that her cousin was her skin color (she and her cousin are Hispanic). Participant 17 shared that her friend, who is HIV positive, takes both ART and a post-exposure prophylactic (PEP) medication, which is used to prevent the acquisition of HIV. She said that these medications "make their kidneys hurt because it's just too much for the body." These misconceptions add to the continued stigma that PLHIV faces.

Theme 3: Discrepancy between beliefs, perceptions, and behaviors regarding U equals U and HIV risk. There were several instances of discrepant events in the study. All perceived risk and expressed unwillingness to have unprotected sexual intercourse with someone with an undetectable HIV load, even the women who expressed belief and acceptance of the U equals U concept and its accuracy, 7 (33.3%). Participant 8 said, "Yes, I believe and accept it, but I wouldn't chance it. I'm sorry, no." Participant 10 said, "… cause they're controlling themselves

with their HIV, with their treatment constantly, so, I don't think they'll pass it. … No. Because you never know if he won't transmit it to you right there. It doesn't matter if he's controlling the, taking his medication, or whatever. But maybe you'll get it still." Participant 19 said, "Oh yes, I believe that. … I don't believe that it would be said if it wasn't true. … But at this point in my life right now and having the power of choice, I would say no."

Subtheme – I believe it, but I don't. The majority (47.6%) did not believe in the concept. Some women said outright that they would not trust it, like participant 5, who said, "I wouldn't still trust it. I wouldn't because it, it's just the simple fact of it being HIV." Participant 7 said, "I don't believe that. No." All the women expressed skepticism toward the U equals U concept and believed there was still a chance to transmit the virus sexually, including the only HIV positive participant, #11. "Detectable, right away, undetectable, both ways I thought that I could still give it to him," she said. About four participants did not reject nor accept the concept. For them, it was a fifty-fifty chance of transmitting the virus. "Well, there's a maybe there cause probably they can, probably they can't. … Oh no, I wouldn't have unprotected sex. … I wouldn't risk myself." said participant 12 when asked about her beliefs about U equals U and sexual engagement. About three participants expressed that for an established partner, they would consider having unprotected sex and having a family. "Well, I mean, like, I think it's not a matter of believing it. … I guess it would just be a little bit of fear … There is a possibility, yes." said participant 14, who reported not having experienced any of the risk factors for HIV. Participant 20 said, "Well, if it was a partner that I'm committed to, like a boyfriend, someone that I'm in a relationship with, my husband, whatever, and I now for a fact that they're taking their medication, yes." However, this participant insisted that if it was someone else, she would not engage in unprotected sex. Participant 16 said, "… if I'm in a relationship and it's with a

person that I've had like a well-established relationship, and I hope maybe to have kids with them … I mean, maybe trying to have a family … I'd be willing to do it cause I know that they're taking their medication." The overall response was an unwillingness to engage in sexual intercourse even if the partner had an undetectable HIV viral load. They saw this as putting themselves at risk of acquiring HIV.

Some of the women's responses were unclear and made it difficult to ascertain their position on the matter. For example, participant 21 said, "Well, after you know, listening to what you said, I believe it's a no, you know. … I see it as a no, you know. … I'm gonna stand with the research for now until I see different, you know. … it says that undetectable means untransmittable, then it shouldn't be transmitted, from my understanding." It appeared that she was answering no to the question of whether she believed in the concept, but then she said she stood with the research and understood that it could not be transmitted if it is undetectable. After further probing to clarify what she meant, she responded, "It's hard to believe that for me." The concept may have been too complex or unclear for some participants because some of them changed their responses regarding whether they believed in the concept.

Subtheme – Risk levels. Another paradoxical trend in the study was when participants kept assessing their HIV risk as low (52.4%) even though most were in a facility receiving SUD services (66.7%). For example, participant 1 said, "I think it's low, and it's just mostly my anxiety, I think like, just, I'm scared. I'm scared to get it, so. That's why I've been trying to stay abstinent." Participant 8 stated, "Right now, I have no risk cause I'm not having intercourse. So right now, I have no risk." They were making those judgments because of where they presently were. "I'm here in…because I am in this situation I am in right now. I'm not doing anything. I'm not being sexually active," said participant 13, who was in a women's

shelter. Some women insisted that their risk was low even after probing about pre-rehabilitation activities. Participant 2 said, "Low risk cause I only have one partner." Participant 6 said, "I think it's low, yes. Cause I would like to trust that person that I've been with for fifteen years." While others said that they do inject drugs and are scared of getting HIV but still think their risk is low due to not having sexual partners. Participant 21 admitted, "I have injected drugs.… It does scare me with the drugs … my risk should be, you know, real low to moderate just because I'm not a real social person." Only 8 (38.1%) of the women assessed their HIV risk as high.

Subtheme – Lack of HIV testing. Another contrary pattern was the frequency of HIV testing among those who perceived their risk to be low but tested frequently. While those who perceive their risk to be high either have never done an HIV test or have only done one or up to three tests. Those that test regularly (yearly or more frequently) mostly say that they get tested as part of an annual checkup or due to pregnancy. For example, participant 1, who thought her risk was low, shared that she tests monthly "… because I was so close to my best friend." whom she believed had HIV and their last sexual contact was about four years ago. Upon probing, she revealed that her current partner "had multiple partners," and she gets tested frequently, "… checking to make sure." Participant 2 said, "So, it's like, yeah, I've been pregnant, so I get checked all the time." then later assessed her risk as low because she only has one partner but high because "everybody is sleeping with everybody nowadays." Another example of this irony is participant 6, who smoked cocaine and perceived her risk to be low but tested "Probably like every two months or every month." Later she shared that she does get scared "every time that we do test here [SUD CBO]." Participant 3, also interviewed at the center, said that she has only been tested once but believed her risk was low, "If I stay away from basically … how do you say it? Not do intercourse, then I can, then I'm lower [referring to her HIV risk]." Participant 5 said

that she does her HIV test "every time I do my annual checkup. That's the only time I do my HIV testing." although she acknowledged a risk due to "… a lot of men and women, they're not into the long-term relationships anymore. It's more like sex and until I see you again." Participant 19 revealed that she has been "prostituting myself unprotected. I've been raped." And believed that her risk was high and said, "This will be my first one." when asked how often she has been tested for HIV. A few participants who acknowledged their high risk also stated that they often test, like participant 9, who admitted to using IV drugs and sharing needles with her sister, who had Hepatitis C and HIV. "Every three months at least, when I can." was her reply about how often she tests for HIV because she is scared, and, "… certain things like that, they hide, and then they can come out positive after five years or possibly more." While others also talked about encouraging others to get tested and shared about their STD testing as well.

Subtheme – STD experiences. Participant 3 shared, "I like to be sure, like, they get checked before any of that, so [referring to sexual activity with partners]." And participant 8 contributed, "Getting tested is a good thing, but it's like, some people don't do it …." Participant 2 conveyed that she had "… come out one time with an STD." and she would always encourage her partner, "… you have to check yourself. Check yourself! Check yourself!"

Theme 4: Positive attitudes toward U equals U and PLHIV. Although about one-third of the women (33.3%) believed in the U equal U concept (cognitive domain of attitude), 19.1% expressed doubt, and 100% perceived risk from sexual intercourse (behavioral domain) with someone who has an undetectable viral load. A few women had favorable attitudes in the affective domain toward the concept of U equals U in that they believed in it. When asked about how they felt about the concept and how it would impact the lives of PLHIV after it was explained, the women replied, "That actually gives me a lot of hope. I mean, I've never been

positive for HIV … they could live a long healthy life." (participant 4); "… I really could hope of living a normal life." (participant 6); and "That makes me feel amazing, like oh wow!" (participant 8). Participant 18 said, "It changes my view a lot, like I should really start getting tested. And not just one time either." when asked how the U equals U impacted her beliefs about HIV testing.

Subtheme – Normal life and identity. When referring to how U equals U might impact the experiences of PLHIV, 8 (38.1%) of the respondents provided positive statements such as: "I think it would just be like normal life for them. … They would just be like anybody else" (participant 1); "I think it could also give them a positive impact … maybe it's giving them a hope of living longer." (participant 7); "… it will probably be something that's relieving…" (participant 13); "… I definitely believe that one might come to like live their lives a little more hopeful, you know." (participant 14); "I think that their behavior will be one of behaving safely." (participant 19); "I think it gives them a little bit more sense of liberty when it comes to sexuality or to being sexually active" (participant 20) and these sentiments were also repeated "It might make them feel a lot more free and a lot more happy." by participant 21. Others felt that it would not have any effect or no change on the lives of PLHIV. For example, participant 2 said, "I believe they will be more calmness, but it won't change anything." Participant 3 said, "… I don't think it will have anything behavior-wise. I'm not sure about sexual wise." Participant 16 said, "So, it's important that even when you have reached that stage, you still take your medication, you still do the checkups …" because "it doesn't mean you no longer have HIV." She later stated that their sexual behavior might be impacted when the point of "… maybe I can have unprotected sex with my partner." is reached.

Subtheme – If it's someone you love. Positive affective and cognitive attitudes toward U

equals U were not limited to the individual level and experiences but also extended within family relationships and at the community level. Participant 2 was the first to say that PLHIV would take a chance for the people that they really love "… so it gives them hope and faith." Others, like participant 5, hoped that the undetectable status would cause PLHIV to "… do all the right things to keep it that way and stay safe like, protect, practice safe sex…." Participant 4 shared a similar stance, "Yes, like I said, they'll probably be more cautious, more responsible." In relationships, according to participant 7, they may feel safer to "try to engage in sexual activity with their partner." while also giving them "hope to living longer." Also, participant 9 said, "I mean, I would say they'd be more wiser about it, maybe." Meaning to limit their sexual partners. Participant 14 also shared similar views about the desire to maintain management of one's viral load and that she thought it would have more open relationships. "So, I think maybe they might be more positive, more open with their relationships with family." Families feeling safer was one way that participant 15 said that relationships would improve for PLHIV with an undetectable viral load. Stronger relationships would result, according to participant 19, because "… you have a loved one who at one point could have died … but now presently it seem that there's a chance that they can live a normal life with their family longer than what it was before." For participant 20, this comes as "a little bit more peace of mind" and "more trust amongst each other" for those willing to disclose their medical status. HIV is "not a death sentence" and is like any other disease, according to her, due to the medication. Participant 21 took a neutral position and said that she hoped that people's family relationships would not be affected, but "Everybody has their different opinions." And she cannot "speak for everybody."

When asked whether they felt their family would accept the message of U equals U, 7 (33.3%) agreed and 5 (23.8%) said maybe. Participant 3, for example, said that her family

would believe because it is scientifically proven and people in the community may "have a little more respect" for PLHIV who have and undetectable status. Participant 8 also said that her family would accept the U equals U message "Because we tend to hang on to Scientists' discoveries and we like, we trust them to do, that what they're saying is true." She also felt that "people getting together more now … with their family closer like, if they sneeze, they won't, they probably be like, 'Oh never mind, she's undetected.'" Participant 21 shared a similar view based on objectivity. "In my family, I believe they will [believe the U equals U concept] … because … they believe, you know, a little bit in science …" She went on to explain that her mom is a little more religiously oriented. She was also the only participant to express that community beliefs would be based on class. As for participant 19, she believed that her family would not "even give it a thought" because her family "consists of alcoholics and addicts" who "don't care about none of that stuff." She later leaned more toward a positive family attitude because "… we have somebody in our family who has AIDS. I think they would be more open to accepting that this is something that is, like, factual." Participant 20 commented that people her age, "mid-thirties" and "early forties," as well as members of the LGBTQ community, would accept the message because "… of course, they're gonna be a thousand percent more understanding than some macho Mexican man, you know. Cause they're more aware, they're more liberal; they're more open and free." This participant was the only one to talk about the LGBTQ community accepting the U equals U concept.

Subtheme – In the middle. Among those who thought that their family might accept the U equals U message are participants 4, 5, 12, 13, and 15. They respectively said, "I would say it's a fifty-fifty, depending on their age. Like younger people would believe stronger in this because of technology and, you know, more medicine than older people;" "That would be like a

fifty-fifty. Maybe some would believe in it, some would still be sketchy about it;" "Some might understand, some might not;" "Yeah, I believe … some of em would side with me, but I know a couple who would try to say differently;" and "Yeah, I think it depends on the person presenting the information, if it's like a doctor, a medical doctor or a scientist or if it has been spoken on the news. Yeah, they'll start to believe it." Although participant 12 started neutral, she went on to share, "We probably might not feel different towards them. We will still accept it if they're low or they're full-blown." Also, participant 15 continued to say that she believed her family would be more accepting of someone with an undetectable viral load because most of her family members are educated at the college level. "So, we're very perceptive of like the science advancing and stuff."

Positive attitudes were also prevalent at the individual level. An overwhelming majority of the women (95.2%) advocated for the promotion of the U equals U message in the El Paso region. Participant 20's response echoes the general feeling among the women. "Yes, yes, a hundred percent, a thousand percent yes!" was her reply to the question of whether U equals U should be promoted in the El Paso region. Participant 6 saw the promotion as a way "… to educate people that don't know." She believed the message would be one of "… hope that you can live a normal life and not be afraid all the time." Participant 14 shared a similar view that "It should definitely continue to be promoted. I don't think that a lot of people are, I mean, it's not common knowledge…." Participant 8 captured the sentiments, "Yes, yes, yes! Cause again, before I came here, … And before you told me, I didn't know. I think you should keep promoting it. Because that's amazing." Participant 21's opinion was that "I think we need it pretty much everywhere." This participant concluded the interview by saying, "I know it's been an ongoing thing for a really long time, and for people to get to the point where they say I'm

undetectable and untransmittable, I'm pretty sure they're real happy to say that." A single participant thought that the message should not be promoted at all. "No, I don't think we should promote that message at all." asserted participant 5. When asked why she explained, "Because, like I said earlier, … they're gonna be careless and stop practicing safe sex…." She later agreed that there is some benefit to promoting the message since "… now the community will know that, ok, it can be reversed and a lot more and… they're not gonna be like I said, more like discriminating people anymore towards them." This influence was an important point to emerge. Some suggestions to promote the message from the overwhelming majority included: commercials on TV, radio, social media, word of mouth, health fairs, visiting primary and mental health and SUD institutions, jails, HIV testing stands, sexual education classes, schools, webinars, shopping plazas, churches, even festivals, and concerts.

Subtheme – Others' HIV experience. Positive attitudes of non-judgment and support, and compassion prevailed toward PLHIV, with 19 (90.5%) of the women sharing sentiments such as, "No, there's no like, I mean, it would not bother me to visit someone who has HIV." said participant 1. "I can say I do feel bad for them cause it's, yeah, it's not something somebody should be living with." said participant 3. Later she shared, "I wouldn't treat them any different, that's for sure." when asked if her attitude would change if it were a close family member. Participant 7 explained that "… they're just like us, they're normal…. I don't feel anything toward, well, you know, nothing out of the ordinary." She later explained that she was more educated on HIV and felt comfortable around PLHIV. She continued, "I just think that, you know, that they were dealt the wrong [card], you know. That they're unfortunate to get the HIV disease." Participant 8 had a similar attitude, "It makes me feel sad for them…. I didn't see him [referring to an uncle who died of AIDS] any other way different. I don't like misjudging

situations, so I try to look at him. I loved him…. Again, some people are innocent kinda in the situation, but it happens." She explained that her uncle acquired HIV from a cheating wife. Participant 9, who disclosed that she had a sister living with HIV, shared, "I treat everybody the same. I don't think anybody should be treated differently." She shared the warm affection she displayed toward her sister, such as hugging her and kissing her, because "she already felt bad enough that everybody else didn't" do these things with her. "I did see it as some type of punishment, but then … seeing it in other pastures, I saw that God don't punishes us. So, and we're not here to be judged, you know. … Exactly, I'm not here to judge, so why should we be judging them, you know?" explained participant 12, who disclosed that her cousins acquired HIV through MSM activity. She later also shared that she feels sad for them. "I just feel it's quite unfortunate, yeah. I guess I feel sorry for them." said participant 15. Participants 14 and 19 also went as far as expressing notions of admiration for PLHIV. When asked how they felt about PLHIV, participant 14 started, "I guess, definitely empathy and admiration … it take like a lot of character, a lot of strength to be able to wake up day by day and like, follow the right diet, to adhere to your medications…." and participant 19 said, "I mean, I think they have a inner strength and… if I was to get some type of disease, I would pray that I'd be the same way." Participant 2 brought out the compassion, "And I just think that we have to have compassion for them also because their life is like, more delicate than ours."

As with attitudes toward PLHIV, attitudes toward HIV treatment were also majority positive, with 15 (71.4%) expressing only positive thoughts and another 4 (19.1) expressing a mixture of positive and negative beliefs. Participant 1 was the first to share that "HIV is treatable." She continued, "It's not like you just have HIV and you're just going to die from it. I mean, it's treatable." Participant 2 shared, "You know, they can live longer. They have hope …

Treatment is always better than not treating at all." Participant 5 expressed, "I know that the medications out there help them live a little longer. Can live, can continue living their normal life." "I know the medication helps a lot to live a little longer than they should…. So, I think the medication is very much needed." said participant 9. As for participant 11, "I think the treatment is good as long as you do it." and was very excited to report that she did not have any side effects from her current medication that she was taking for HIV. Participant 13 thought that "the treatments need to go around fast…." Participant 16 did not hesitate to say, "I believe it works and I believe it's just that some people sometimes get in late in life, you know, like later stage." She then discussed the accessibility of treatments to some people but believed that "It is a good thing. It impacts them, I would say, in a positive way … because it boosts your immune system …" Participant 20 was also quick to say "they work" when asked about her beliefs about HIV treatment. She explained that she had a fiend whose doctor told him that "he could live a long and healthy, 'quote,' 'unquote,' life" if he adhered to his medication. She continued to explain, "I have a lot of faith in science itself, not just with HIV and medication but in general, you know."

Theme 5: Stigma, fear, and discrimination related to U equals U. While the women shared positive views of U equals U and PLHIV at the individual level, they mostly shared negative views about PLHIV at the interpersonal and community level. Participant 5 began sounding positive, but it quickly turned negative. "… Their gonna gain their full confidence back and I believe they're gonna go back to their old habits instead of being more safe about having intercourse or only one partner," she said. Participant 6 shared a similar thread, "I won't believe that people wanna be careless, but there are people like that. That are just mad at the world. … a woman just closed in, be closed in by myself." because she would be bothered just knowing she has HIV regardless of the detection status. Again, participant 7 remarked, "… they could fall

back into that old lifestyle and it's like, well, if I don't have it then you know, we can still do this, we can still do that [referring to sharing needles and having unprotected sex]." "But I think it may cause people to have sex with anybody now. Like, they won't think of the consequences… if you can't even catch AIDS." participant 8 explained. Participant 17 asserted, "I just think that they would take advantage of it, and especially if they're deciding to engage in that unprotected sexual behavior with somebody else." "… it's just playing like with fire." she continued. When asked how she felt about the U equals U message, participant 9 replied, "I'd probably say that's why I don't interact too much … I guess it's good for the person, but I mean, could still be careful."

Participant 10 was the first to mention that other family relationships may be negatively impacted due to nondisclosure of status even after achieving an undetectable status. "Yes, cause they're gonna be embarrassed to tell their family members… because they're gonna be scared to be or to tell their partner what they have…." she said. She also thought that PLHIV would get depressed and be scared to have sexual relationships because of their U equal U status. Participant 11, living with HIV, somewhat confirmed this notion. She said, "Oh, it's changed all right. I don't wanna have sex with anybody!" and disclosed that she "always use a condom no matter what." On the other hand, participant 12 also echoed the negative views as participant 10. She shared, "A lot of people might not understand em…. They might think they're probably not acceptable. … people might judge em." even with an undetectable status. She also said, "They might just stop having sex." Participant 15 also thought that "… they would not mention anything." because of stigma, fear, and gossip. Continuing along the lines of persistent stigma toward PLHIV, participant 17 said that "… people might see these individuals living with HIV as like a bad person or a dirty person…. for the rest of their lives." Participant 13 discussed that she

would lean more toward a negative outcome because of "family drama," which she said would cause family relationships to "change drastically." As for sexual relationships, she believes it depends on the person. Participant 16 also believed that it depends on the family member but believed that stigmatizing attitudes "might not change" because "… they are not willing to listen to you right now." Although participant 18 closed off her statements with a positive note that U equals U is "gonna bring em closer," talking about family relationships, she started negatively by saying, "if it's undetectable, I really don't wanna hang out with you." And later said that people would think that they should "still stay away from certain things, from certain people."

Subtheme – Personal vs. family/community perspectives. Stigma and discrimination were reportedly more prevalent at the family/community levels, with 9 (42.9%) expressing negative views at the family level. Participant 1, for example, said, "I think my family is more like, like they hear HIV or something and they see like, stay away!" She further said I'm not so against, I mean, I am against it myself. I don't want to ever have it, but like, I am not so against like my family is." Participant 3 talked about people in the community just being judgmental. "I'd say for people in the community, some do judge because they're just not, some are not nice." she said. While participant 8 said, "You always have doubters … some people will be like, 'Oh, that's not true' because they lean more on things going wrong than things going right." She also did not believe that culture or religion played much of a role in accepting or rejecting the message but more because "… the world is built on, like, sex, money, and drugs." and that it is easier to believe in something where there are "no consequences." It is noteworthy that most of the women gave a lack of knowledge or education as their initial answer for these negative attitudes. Upon further probing about cultural/religious/social factors, they discussed the Hispanic/Mexican/other cultural and religious aspects. Participant 19 said fear might be a reason

for not receiving the U equals U concept by some community members, “But if they’re more knowledgeable …” they would be more receptive. Some even denied that these had any influence on the community’s attitudes toward U equals U or PLHIV, such as participants 8 mentioned above and 5 and 11. “I don’t think race or culture would have anything to do with it.” Expressed participant 5, who believed that acceptance of U equals U would not increase “until we start seeing more couples like that [referring to serodifferent couples with an undetectable person].…..” For participant 11, “Maybe religious, I don’t know. I just think people just don’t understand it.” she said. Participant 18 also said, referring to religion and culture, “I don’t think it’s any a those.” She believed that the community’s attitude toward U equals U is based on political and scientific beliefs “because it’s been proven.” While participant 13 boiled it down to “just their opinions.”

Subtheme – Hispanic parents and culture. While they were not the main reasons given for negative attitudes to U equals U, participant 20 stressed that generational, cultural, and religious factors played a big role in community members' attitudes toward the concept. “Like I said, … I put my parents as an example; being older Mexican people, they will still have questions, especially my father, you know. … Like, ‘Oh my God, AIDS!’” She continued, “So, older generations, not necessarily Mexicans. My best friend’s dad is Nigerian, and he … it took him a long time to process that his son had HIV.” Upon further probing, she also felt that “especially nasty religious obsessive people will think, ‘Oh, that’s what happens to promiscuous people.” Participant 9 also spoke of personal experiences with her sister, “… Hispanics can be a little mean sometimes, and they stick with it… Yeah, especially with the men…. I know because my father is that way, and … he didn’t want me going around her and stuff like that.” Participant 12 shared this view, “A lot of em probably will base it to religion. A lot of em will probably base

it against culture." "… Into God's eyes, they would see it in a bad way… them dating other women, them dating other men. Probably not knowing that they got it some other way." she additionally said after being probed to explain her comment on religion and culture. Furthermore, many participants referred to the "upbringing" of older generations making it "a little harder to change their way of thinking," according to participant 4. "Like even back then, you know, they were so scared of it, and they would treat em different." she explained. But even within this generational context, a lack of understanding appeared. "I don't think that they would even understand …" said participant 4. Participant 13 also mentioned the "… way they grew up…" and the choices they make.

Some women validated the family/community's negative position of U equals U by comparing it to how their family treated them as drug users. Participant 1 said, "Just like when I was abusing [using drugs] so they would just push me out of the way. … It was just like that. Like if somebody have HIV, they would just like stay away from that person." And she confirmed that it would be that way even if the person had an undetectable viral load. Participant 6 recollected, "My family is ignorant to something like that [referring to belief in U equals U]. Because they already acted with me with knowing that I used drugs. I could imagine with somebody with HIV…. They act like that with me when I using drugs. They don't want me, not even inside. I think they're just ignorant." She further explained that this behavior was enacted mostly by her siblings rather than her parents. Participant 21 shared, "Some people get pushed away and want nothing to do with that person, you know. I kinda know how that feels … just because of my drug use and the situation that I'm in, you know." Participant 11 spoke to these thoughts with her experience with an intimate partner. She said, "And, once he found out I had HIV… he was like, 'you know what, this is not gonna work out, we're just gonna be friends.' …

It was very hurtful." A few participants also shared that people just don't care and "don't want to hear about it [U equals U]." like participant 3.

Subtheme – Barriers to promoting U equals U. Even those that advocated for the promotion of the U equals U message via commercials/advertisements reported that their family "wouldn't even want to see it on TV or anything. … like it's unnatural, I guess." said participant 1. She continued to clarify that they believed in one partner in marriage. Participant 20 shared the moral/religious perspective of society which may view us as "promoting unsafe sex… religious people who don't want you to promote sex…." Participant 14 shared a similar community perspective, "I think, this is not based on like my own beliefs or anything, but I do believe that somebody out there might be thinking that you're promoting certain actions or you're promoting certain negative behaviors." Others, like participant 17, felt that "Just because people are set in their ways," they may reject the concept. She highlighted that stigma was also a major barrier since "There's a lot a stigma surrounding people living with HIV." Similarly, participant 16 shared, "… HIV is like a topic, a taboo or unaccepted…." And also shared similar considerations for financial limitations and reading level of information for the general population as participant 17. Racial barriers were more salient to participant 8. "Would be the doubters, the people it's coming from. So, that right there, I think, will fall into the racial aspects of, no offense, if, I think if a White person was promoting it, they will believe it more on TV than they would believe if a Black person was trying to stop you and talk to you." One participant even thought that the school districts and "mean" people would oppose the message being spread in the community, participant 21. And participant 5 thought that the message should not be promoted at all.

This participant, #5, was also one of the two who shared personal negative views toward

PLHIV. She said, “I was discriminated him. But he wasn’t aware of it.” referring to a friend living with HIV. “I was just very anxious for him to leave.” She explained that she was worried and wanted to clean wherever he touched because she had a two-year-old son.” The other, participant 6, who shared a negative view of PLHIV, said, “I think it’s sad and I feel scared for them… I don’t hate them. I just, I would not be very close or keep my distance. Cause I’m scared it … the virus.” She could not immediately think of a barrier that would prevent us from spreading the U equals U message in the El Paso region.

In summary, of the 21 women who participated in the study, only about a quarter of the women (n = 4) were aware of the U equals U concept. Three of these women had a Bachelor’s degree or higher. One of them was living with HIV. All of them learned about U equals U by reading articles and stories about PLHIV. Attitudes toward U equals U were mostly negative, with only 33.3% of the women indicating that they believed in the concept, and all the women perceived risks of HIV transmission through unprotected sex with an individual who attains an undetectable status. On the other hand, all except one participant advocated for the promotion of the U equals U message in the El Paso region and agreed that it would “normalize” life for PLHIV and reduce the stigma that they experience. However, the one participant who opposed promotion felt that it would cause PLHIV to engage in RSBs without considering the possibility of transmission to others. Participants’ attitudes were very positive toward PLHIV and HIV treatment at the individual level. But at the community level, perspectives were mostly negative. The most common reason cited for U equals U rejection by community members was lack of knowledge. The women held some misconceptions about HIV transmission and others even had conspiracies that a cure existed for HIV. Overall, the concept of U equals U seemed to be challenging to grasp for some of the participants. The five themes that emerged from the study

are: 1) Awareness of U equals U and HIV-related issues, 2) Unawareness, lack of knowledge, and misconceptions of U equals U and HIV-related issues, 3) Discrepancy between beliefs, perceptions, and behaviors regarding U equals U and HIV risk, 4) Positive attitudes toward U equals U and PLHIV, and 5) Stigma, fear and discrimination related to U equals U.

Quantitative Survey Data

The data were cleaned and analyzed for missingness. Cases were excluded if they had all variables missing for a scale or missed an attitude outcome. Race/ethnicity, age, and HIV status variables had no missing data. True conditional variables such as HIV ART status and U equals U source were not included in regression models (these are specified in result tables). Dummy variables were created for race/ethnicity, marital status, education, religion, and sexual orientation for regression analysis. Scores were computed and categories were created for scales and categorical variables, respectively, using cutoff values indicated by developers/authors where appropriate. These were then used to report descriptive statistics for these items. The final regression model for each attitude outcome variable included only variables that were significant ($p < 0.05$) in bivariate analysis.

Descriptive Statistics. The univariate analysis of each variable at different levels of the SEM are described, including statistic of proportions, frequencies, and distribution.

Individual factors. Demographics, health-related factors, risk perception, and risk behaviors, as well as awareness and attitudes, are discussed.

Demographics. The women (n = 134) who partook in the survey portion of the study were majority Hispanic (50.7%), with a median age of 35.0 years (IQR = 28.8, 41.0 and range 18-87 years), and married (37.6%) with a Bachelor's degree (27.1%). They were also primarily Christian (84.2%) and heterosexual (80.5%). They were employed (73.1%) full-time (74.3%)

with a median income of $35,500 ($17,000, $50,000). Less than a quarter (13.7%) of the women were born outside of the U.S., averaging 19.6 years in the U.S. (SD = 14.1). See Table 6.

Health-related factors. Overall, the participants had good health and low HIV risk factors.

HIV and PrEP. A large proportion of the participants have been tested for HIV (67.4%) and a very small amount (3.0%) reported being HIV positive. Three out of the four women that reported being HIV positive indicated that they were currently taking antiretroviral (ART) medication for HIV. Unexpectedly, more than a quarter of the women (32.0%) reported that they have ever been prescribed Pre-exposure prophylactic (PrEP) medication. See Table 7.

Mental health. A high proportion of women, although not the majority, screened positive for being anxious (46.6%) and depressed (42.5%). However, the majority rated their quality of life as being good, very good, or excellent (60.4%). See Table 8.

Perception of HIV risk and behaviors. Their HIV risk perception was also high, with a median score of 17.0 (IQR = 14.0, 21.0) on the HIV Risk Perception Scale (HRPS) and a range of 7 – 40 (Table 8). While their risk-taking behavior score was low, with the median HIV Risk Taking Behavior Scale (HRTBS) score among all participants of 6.00 (IQR = 0.0, 10.0). On the HRTBS sex and IDU subscales, 72.2% (n = 133) and 15.4% (n = 130), respectively, had a score ranging from 1 to 25 (maximum score = 25) and 1 to 20 (maximum score = 30), respectively among those who indicated that they had engaged in these activities in the last month. Combined, a total of 73.1% (n = 134) had a score of at least 1 (data not shown).

While the IDU subscale showed very low prevalence among the participants on the HRTBS, the TAPS revealed that those with a substance use disorder (SUD) in the past year as defined by a score of 2+ on the items was prevalent for tobacco (49.3%), alcohol (53.7%), any

drugs including marijuana, cocaine or crack, heroin, methamphetamine (crystal meth), ecstasy (MDMA), hallucinogens (24.6%) and prescribed medications (13.4%). While SUD was prevalent, social media use among the women was also high, with almost three-quarters (72.4%) of the participants having two or more social media accounts; more than half (63.9%) spending one or more hours a day on social media and over a quarter (29.3%) spending more than 2 hours a day on social media. Social media had a greater than minimal impact on their attitude toward PLHIV, who have an undetectable viral load for 71.6% of the participants. See Table 9.

Attitudes toward PLHIV and HIV treatment. Negative attitude toward PLHIV was high, with a mean HIV stigma score of 25.5 (IQR = 14.0, 35.0; range 9-43). However, their attitudes toward the subscale HIV treatment prevents transmission was very low on agreement (21.6%) versus their positive attitude in agreement with early HIV treatment is necessary (80.6%); having positive attitudes toward these belief statements was indicated by an average score of 4 or higher (range 1-5). It must be highlighted that over three-quarters of the participants (78.4%) had an average score below 4 for the statements regarding HIV treatment as prevention (TasP) which indicated disagreement and negative attitudes (Table 10).

U equals U Awareness. A surprisingly large proportion of the women reported having heard about the undetectable virus was untransmittable prior to the study (69.2%) from their health care providers (35.3%), followed by social media (17.2%) and other (10.3%). Other sources included a local behavioral health CBO, clinic, college course, foster care, a local health promotion program, TV programs, and work. See Table 7.

Attitudes toward U equals U. Attitudes were positive for the belief in the accuracy of the U equals U concept, with 47.0% indicating that it was completely accurate, while a quarter (23.9%) believed it was somewhat accurate (data not shown) and only 20.1% thought that it was

inaccurate. About one out of every ten (9.0%) participants chose "I do not know" regarding the accuracy of the U equals U concept. They were grouped with people who thought it was inaccurate for the regression analysis. Approximately one-third (32.8%) believed that there was no risk of an HIV positive individual transmitting the HIV virus sexually to a partner, while a higher proportion (41.8%) thought that there was a medium, high and complete risk. A small proportion (6.7%) were very likely to have condomless sex with an HIV-positive partner who has an undetectable HIV viral load, and another 10.4% responded that it was likely. However, the majority (59.7%) responded that it was unlikely, while 23.1% were unsure and were combined together with unlikely respondents. See Table 10.

Social Factors.

Relationships. Perception of social support (PSS) was good, with a median score of 22.0 (IQR= 19.8, 25.0; range 6-30), while experiences of intimate partner violence (IPV) were low with only 8.3% of the total sample categorized as being abused in the past year. Furthermore, the participants' exposure to people living with HIV was low, with only 8.2% indicating that they had a family member who had been diagnosed with HIV compared to almost a quarter (24.6%) who had a friend diagnosed with HIV. See Table 11.

Organizational and community factors. Table 12 shows that 78.6% reported having a primary care provider (PCP) and about two-thirds (65.5%) agreed that they felt comfortable discussing their sexual health/HIV concerns with their PCP. A high proportion (74.8%) indicated that they were satisfied or extremely satisfied with their last appointment with their PCP. Only about one-third (31.8%) of the women had a commute that was less than 30 minutes to their PCP. Community stigma toward PLHIV was again high, with 63.6% agreeing or strongly agreeing that most people would not buy vegetables from a shopkeeper or food seller

that they knew had HIV. More than half the participants (57.6%) agreed or strongly agreed that most people in their culture think that HIV treatment is effective (i.e., makes people healthier), leaving 42.4% who either were neutral or disagreed with the statement. However, an even greater proportion (53.4%) was either neutral or did not agree that most people in their community (parents, siblings, friends, etc.) will trust that an undetectable HIV load is untransmittable, with over one in ten (10.7%) strongly disagreeing. In contrast, only a little more than one-third (37.1%) agreed or strongly agreed that PLHIV and having an undetectable viral load will engage in RSBs, such as having multiple partners, unprotected sex, and unprotected sex under the influence of alcohol/drugs. Participants generally reported agreement with favorable aspects of their neighborhood, with more than half (55.0%, 53.1%, and 63.8%) agreeing that people can be trusted, people generally get along with each other, and they have easy access to transport in their neighborhood, respectively. While they had a high level of disagreement with negative statements such as people are afraid to go out and gangs are a problem in their neighborhood (85.3% and 83.8%, respectively).

Logistic Regression Analysis.

Attitude outcome #1. Beliefs about the accuracy of U equals U

Model 1 - Demographics. Bivariate analysis test (Chi-Square test) of belief in the accuracy of U equals U showed a significant relationship between Hispanic (27.9%) and non-Hispanic (66.7%), Black/African American (77.6%), and other races/ethnicities ($p < 0.001$; Figure 2). Likelihood ratio tests showed statistical significance with: marital status — single (23.3%), married (68.0%), divorced (62.5%), and other marital statuses ($p < 0.001$); education among those with Master's degree (40.0%), Bachelor's degree (66.7%), Associate degree (45.5%), vocational training (41.9%), high school (35.5%), and lower levels of education ($p =$

0.024; Figure 3); Christianity (54.5%), other religions (11.1%) and Islam and other religion ($p < 0.001$); heterosexual (55.1%), homosexual (18.2%), bisexual (15.4%) and no sexual orientation ($p = 0.002$). Chi-Square test also revealed a significant difference for those who were working (56.8%) and those who were not (22.9%, $p < 0.001$); ever getting an HIV test (53.9%) and not (32.6%, $p = 0.021$); prescribed PrEP prescription (75.6%) and not (35.6%, $p < 0.001$) and aware of U equals U (63.3%) and not (12.5%, $p < 0.001$). No difference was seen for age, birth country, and HIV status. Therefore, these variables were not included in the regression analysis. Income showed a statistical difference for those who believed (mean rank = 74.7) compared to those who did not believe (mean rank = 44.3; $p < 0.001$). However, income was not included in regression analysis due to the high amount of missing data. See Table 13 and Table 14 for bivariate analysis results with demographic and HIV-related variables.

Overall, 83.8% of the outcome of believing in the accuracy of U equals U were correctly predicted given the binary logistic model, which included demographic variables such as race/ethnicity, marital status, education, religion, sexual orientation, working status, HIV test status, PrEP prescription, and awareness of U equals U. The model was statistically significant, $\chi 2\ (19) = 87.444$, $p < 0.001$ with 52.6% to 70.2% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of belief in the accuracy of U equals U being explained by the demographic variables in this model. Being divorced compared to being single, identifying as homosexual and bisexual compared to heterosexuals, working, having an HIV test, and having heard about U equals U showed a significant difference in odds of believing in the accuracy of U equals U after controlling for the other variables in the model. Although being of Black/African American race/ethnicity showed 3.984 times higher odds of believing in the accuracy of U equals (CI = 0.726 – 21.860) compared to Hispanics, the association was not significant ($p =$

0.112). On the other hand, those who reported being single, identifying as homosexuals or bisexuals, not currently working, not receiving an HIV test, and not hearing about U equals U were less likely to believe in the accuracy of U equals U. In other words, those who were divorced, heterosexual, currently working, received an HIV test and have heard about U equals U were more likely to believe in the accuracy of U equals U. See Table 18 for results of regression model 1 with the demographic variables.

Model 2 – Health factors. Table 15 shows the bivariate analysis for these factors. A Chi-Square test of the attitude variable of believing in the accuracy of U equals U showed a significant association with anxiety ($p = 0.003$) and depression screens ($p < 0.001$). Likelihood ratio tests of alcohol use ($p = 0.004$), social media use ($p < 0.001$), and social media influence ($p < 0.001$) were also significant. However, since these social media variables are conditional, they were not included in the model test. Mann-Whitney U test showed significantly higher HRTBS scores among those believing in the U equals U concept (mean rank = 76.56) and not believing (mean rank = 59.46, $p = 0.010$). Factors that were not found to be significantly associated with belief in U equals U include tobacco use, illicit drug use, prescription drug use, HRPS score, QOL, and having social media accounts.

Overall, 66.9% of the model including health-related variables — anxiety, depression, alcohol use, and HRTBS score — correctly predicted attitudes toward believing in the accuracy of U equals U. The model was statistically significant, $\chi 2\ (5) = 20.139$, $p = 0.001$ with 14.1% to 18.8% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of belief in the accuracy of U equals were explained by the health-related variables in this model. The model revealed that those who had a positive depression screen were 2.57 times (CI = 1.043 – 7.828) more likely to believe in the accuracy of U equals U ($p = 0.041$) than those without

depression. Although those who did not have an alcohol use problem (OR = 0.392, CI = 0.140 – 1.099) were less likely to believe in the accuracy of U equals U compared to those who had an alcohol SUD problem, this association was not statistically significant (p = 0.075). Participants with a positive anxiety screen were 1.45 times (CI = 0.593 – 3.543) more likely to believe in the accuracy of U equals U also, but this association was not statistically significant (p = 0.415).

Model 3 – Attitude factors. Bivariate analysis of factors in this model indicated attitudes toward people living with HIV/AIDS (PLWHA) score was significantly higher among those who believed in the accuracy of U equals U (mean rank = 83.01) compared to those who did not believe (mean rank = 53.74, $p < 0.001$). Significant associations by the Chi-Square test of attitude toward HIV treatment as prevention (p = 0.02) and perception of transmission risk with U equals U ($p < 0.001$) were also found. Attitudes to HIV treatment being necessary and the likelihood of engaging in condomless sex with a PLHIV who has an undetectable viral load did not statistically significantly impact the odds of believing in the accuracy of U equals U. See Table 16 for statistically significant data.

The model containing only the attitudes toward PLHWHA score, attitudes to HIV treatment as prevention, and risk perception with U equals U revealed that 83.6% of the variables accurately predicted beliefs about U equals U accuracy. The model was statistically significant, $\chi 2\ (3) = 73.221$, $p < 0.001$ with 42.1% to 56.2% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of belief in the accuracy of U equals U explained by the attitude variables in this model. Positive attitude to HIV treatment as prevention was associated with 6.305 times (CI = 2.107 – 18.865) higher likelihood of believing that U equals U was accurate ($p < 0.001$) compared to those who had a negative attitude. A similar trend in odds of believing in the accuracy of U equals U was seen among those who perceived no risk of HIV

transmission (OR = 29.754, CI = 8.817 – 100.408, $p < 0.001$).

Model 4 – Interpersonal factors. The factors included in this model, which were perceived social support, experiences of intimate partner violence, and knowing a family or friend diagnosed with HIV, were not associated with the attitude outcome of believing in the accuracy of U equals U in bivariate analysis. Therefore, a binary logistic regression was not done for this model.

Model 5 – Organization and community/neighborhood factors. Significant Chi-Square test associations were found between beliefs in the accuracy of U equals U and having a PCP ($p = 0.03$) and feeling satisfied with PCP ($p = 0.002$). A likelihood ratio test also showed a significance with commute time to PCP ($p < 0.001$). Community level associations (Chi-Square test) with believing in the accuracy of U equals U were seen with agreement about people not willing to buy vegetables from PLHIV (57.3%) versus those who disagreed (29.8%, $p = 0.003$); community agreement about the efficacy of HIV treatment (65.8%) versus those who disagreed (21.4%, $p < 0.001$; Figure 4); agreement with community trusts that an undetectable HIV viral load is untransmittable (72.1%) versus disagreement (24.3%, $p < 0.001$). Neighborhood factors such as agreeing that people can be trusted in the neighborhood (66.2%) versus disagreeing (25.9%, $p < 0.001$); agreeing that people are afraid to go out in their neighborhood (10.5%) versus disagreeing (54.5%, $p < 0.001$); agreeing that gang was an issue in the neighborhood (23.8%) as opposed to disagreeing (52.3%, $p = 0.017$); and agreement that transportation was accessible in the neighborhood (58.0%) in contrast to disagreeing (30.4%, $p = 0.003$) were all found to be associated with believing in the accuracy of U equals U. Feeling comfortable discussing sexual health with PCP and the variable asking whether people generally got along in the neighborhood were not associated with accuracy of U equals U beliefs. Surprisingly,

community attitudes about the HIV risk behaviors of PLHIV with an undetectable viral load were not associated with believing in the accuracy of U equals U in the bivariate analysis. See Table 17.

Binary regression analysis with significant bivariate factors at the community level indicated that 76.7% of the accuracy of U equals U beliefs were correctly predicted by the factors in the model. The model was statistically significant, $\chi 2\ (8) = 47.731$, $p < 0.001$ with 32.8% to 43.8% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of belief in the accuracy of U equals being explained by the organizational and community variables in this model. However, only those who expressed that community members would trust in U equals U were 5.004 times (CI = 1.665 – 15.035) more likely to believe in the accuracy of U equals U ($p = 0.004$) and those who reported that people in their neighborhood could be trusted were also 3.312 times (CI = 1.165 – 9.413) more likely to believe in the accuracy of U equals U ($p = 0.025$). Although having access to transportation in the neighborhood showed increased odds and having a PCP showed reduced odds of believing in the accuracy of U equals U, these odds ratios were not statistically significant. In contrast, those with higher negative attitudes toward PLHWHA at the community level, those who agreed that community members of the same cultural background would trust in the efficacy of HIV treatment and agreed that gangs were an issue in their neighborhood, as well as agreeing that people were afraid to go out in their neighborhood were all less likely to believe in the accuracy of U equals U. These were also not statistically significant.

Model 6 –Significant factors with attitude toward U equals U accuracy. In a model with all significant variables from models 1 – 5, 89.7% of U equals U accuracy beliefs were correctly predicted by the variables in this final model. The model was statistically significant, $\chi 2\ (15) =$

96.964, $p < 0.001$ with 56.3% to 75.1% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of beliefs in the accuracy of U equals explained by the variables included in this model. The odds of believing in the accuracy of U equals were higher and statistically significant among those who had an HIV test compared to those who have not had a test. Odds of believing in the accuracy of U equals U remained higher among those with favorable attitudes toward HIV TasP and perception of no risk with U equals U after adjusting for demographics, individual health and attitude factors, and organizational and community factors. Higher odds of believing in the accuracy of U equals U was also seen among those who agreed that people in their community would trust the U equals U concept. Having an HIV test, believing in HIV TasP, believing that there is no risk of HIV transmission and believing that community members would trust U equals U were independently associated with the odds of believing in the accuracy of U equals U. See Table 19.

Attitude outcome #2. Perceptions of sexual risk of HIV transmission with U equals U

Model #1. Demographics. Assessment of attitudes toward the efficacy of U equals U through perceptions of risk of transmission of HIV through sex revealed associations with many of the same variables as attitude outcome #1. These can be seen in Table 20 and included were individual-level factors: race/ethnicity, age, marital status, education, religion, sexual orientation, current work, income, birth country, HIV test, PrEP prescription, and awareness of U equals U. Chi-Square test showed a statistically significant difference ($p < 0.001$) in perceived risk of HIV transmission with an undetectable viral load between Black/African American (67.3%), Hispanic (14.7%), and other race/ethnicities (5.9%; (Figure 5). Age also showed a significant difference between those who had perceptions of risk with U equals U (Mann-Whitney U Test, mean rank = 62.10) compared to those who perceived no risk (mean rank = 78.55, $p = 0.021$). A Likelihood

ratio test also showed a significant difference ($p < 0.001$) among those who were single (14.0%), married (56.0%), divorced (50.0%), cohabiting (22.2%) and other marital statuses (0.0%) in believing no sexual risk was present for transmission of HIV with an undetectable viral load. There was also a statistically significant difference ($p = 0.023$) for education level and perceiving no risk of HIV transmission with Likelihood ratio test. Higher proportions of participants with Master's degrees (40%), Bachelor's degrees (52.8%), and vocational training (38.7%) reported no risk compared to Associates degree (18.2%), high school (19.4%) and no formal education (20.0%). A Chi-Square test showed a significant difference ($p = 0.015$) between Christians (36.6%) and other religions or no religion (9.5%) who believed no risk was present. Those who identified as heterosexual orientation were found to have a difference ($p = 0.009$) in their perception of no risk (38.3%) than all other sexual orientations (11.5%). The perception of no risk of HIV transmission also had a statistical difference by Chi-Square test ($p < 0.01$) between those who were currently working (42.1%) and those who were not (5.7%). Income also had a difference between those who perceived no risk (mean rank = 83.49) and those who did (mean rank = 46.24, $p < 0.01$). Those born in the U.S. (38.1%) compared to those born outside of the U.S. (5.6%) were different in their perception of no risk of HIV with U equals U (Chi-Square test, $p = 0.007$). Those who had an HIV test (39.3%) and those who did not (20.9%) showed a statistical difference (Chi-Square test, $p = 0.036$) in perceiving no risk. Similarly, a Chi-Square test revealed a difference between those who had been prescribed PrEP (65.9%) and those who had not (19.5%) with perceptions of no risk of transmission ($p < 0.001$). Lastly, those who have heard of U equals U (45.6%) showed a difference in their perceptions of no transmission risk (Chi-Square test $p < 0.001$; Figure 6) compared to those who had never heard of it (5.0%). HIV status was the only variable that did not show a difference in perception of risk of HIV

transmission with an undetectable viral load.

The model, including the demographic and HIV-related variables, correctly predicted 87.0% of the outcome of risk perception with U equals U. The model was statistically significant, $\chi 2$ (21) = 91.805, $p < 0.001$ with 55.0% to 75.5% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of perception of no risk of HIV transmission with an undetectable viral load explained by the variables in this model. Within the binary regression model with demographics, increased age showed higher statistically significant odds of perceiving no risk. Being aware of U equals U prior to the study showed increased statistically significant odds of perceiving no risk of HIV transmission with an undetectable viral load. In other words, those who were older and aware of U equals U were more likely to perceive no risk after adjusting for demographics and HIV-related factors in the model. See table 24 for results of the regression model with demographics and this outcome.

Model 2 – Health factors. Bivariate analysis of the perception of no risk of HIV transmission through sex resulted in a statistically significant difference between those who screened positive for anxiety (48.4%) and those who did not (19.7%, Chi-Square test $p < 0.001$); those who screened positive for depression (52.6%) and those who did not (18.2%, Chi-Square $p < 0.001$); those who screened positive for an alcohol problem use (13.8%), SUD (48.6%) and those who screened negative (15.2%, Likelihood ratio test $p < 0.001$). Those who perceived no risk had a difference in HRTBS score (mean rank = 78.42) compared to those who perceived risk (mean rank = 62.16, $p = 0.021$). Those who spent two to three hours a day on social media (66.7%) showed a difference in perception of no risk of HIV transmission (Likelihood ratio test $p < 0.001$) compared to those who spent one to two hours (28.9%), those who spent 30-60 minutes (30.8%), and those who spent less than 30 minutes a day (14.3%). Perception of no risk was also

different between those who were not impacted by social media use (18.2%), had a minimal impact (13.3%), some impact (34.0%, and those with high impact (50.0%), and very high impact (50.0%, Likelihood ratio test $p = 0.034$). See Table 21.

The binary logistic regression model containing the variables that were significant in bivariate analysis resulted in lower odds of perceiving no risk of transmission among those who did not have an alcohol use problem and those with alcohol problem use compared to those who had an alcohol SUD. In other words, those who screened positive for an alcohol SUD were more likely to perceive no risk of HIV transmission with an undetectable viral load compared to those without alcohol SUD. Overall, the variables in this model predicted 72.9% of the outcome of perceiving no risk of HIV transmission. The model was statistically significant, $\chi2\ (5) = 26.746$, $p < 0.001$ with 18.2% to 25.3% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of perception of no risk of HIV transmission with an undetectable viral load explained by the health-related variables in this model.

Model 3 – Attitude factors. Table 22 shows the results of the bivariate analysis with attitude factors. There appeared to be a significant difference in attitudes toward PLWHA scores among those who perceived no risk of HIV transmission (mean rank = 88.09) compared to those who perceived a risk (mean rank = 57.43, $p < 0.001$). Believing in the accuracy of U equals U (63.5%) compared to not believing (5.6%) showed a significant difference ($p < 0.001$) with perceiving no risk of sexual transmission (See Figure 7). Participants who believed that HIV treatment was necessary had a difference (39.8%) in perception of no risk of transmission compared to those who reported negative attitudes toward HIV treatment necessity (3.8%, $p < 0.001$). There were no bivariate associations between attitude to HIV treatment as prevention and the likelihood of engaging in condomless sex with PLHIV who has achieved an undetectable

viral load.

Binary logistic regression with significant bivariate attitude variables resulted in a model prediction of 84.3% of the outcome perceiving no risk with increased odds among those with a higher negative attitude toward PLWHA score, positive attitude to HIV treatment necessity and believing in the accuracy of U equals U. The model was statistically significant, $\chi 2$ (3) = 67.656, $p < 0.001$ with 39.6% to 55.2% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of perceiving no risk of HIV transmission with an undetectable viral load explained by the attitude variables in this model.

Model 4 – Interpersonal factors. Bivariate analyses of perceived risk of HIV transmission with perceived social support, experiences of IPV, and knowing a family and/or friend diagnosed with HIV did not have any significant difference. The lack of significance could be due to the very small proportion of participants who had been abused or who knew a family or friend living with HIV. A regression model was not done for these variables and they were also excluded from the final model.

Model 5 – Organization and community/neighborhood factors. There was a difference between those who had a PCP (39.4%) and those who did not (14.8%) who perceived no risk of HIV transmission with an undetectable viral load (Chi-Square test $p = 0.017$). Being satisfied with PCP (41.9%) and not satisfied (13.8%) also showed a difference (Chi-Square $p = 0.006$) in their perception of no risk of transmission. There was also a difference based on commute time to PCP, with those traveling less than 30 mins having a smaller proportion (11.4%) compared to those who travel 30-59 minutes (54.5%) and those who travel 60 minutes or greater (30.0%) who believed that there was no risk in HIV transmission (Likelihood ratio test $p < 0.001$). Chi-Square test showed that those who agreed that people in their community would not buy vegetables from

a shopkeeper or food seller if they knew they had HIV (42.7%) were different in their perception of no risk of transmission than those who disagreed (17.0%, $p = 0.003$). Agreeing that people from the same cultural background will believe in the efficacy of HIV treatment (52.6%) or disagreeing (5.4%) were different in not perceiving risk ($p < 0.001$). Those who agreed that community members would trust in U equals U (57.4%) also differed from those who disagreed (11.4%) significantly ($p < 0.001$). People in the neighborhood can be trusted agreement (50.7%) and disagreement (8.6%) differed significantly ($p <0.001$) in their perception of no risk of HIV transmission. Agreeing that people were afraid to go out in their neighborhood (5.3%) and disagreeing (37.3%) also differed in this outcome ($p = 0.006$). Similar findings were seen among those who reported gangs were an issue in their neighborhood (4.8%) and those who did not (37.6%, $p =0.03$). Accessibility of transport in neighborhood agreement (39.5%) versus disagreement (19.6%) also differed significantly ($p = 0.021$) among those who perceived no risk of sexual HIV transmission with an undetectable viral load. See Table 23.

The binary logistic regression model containing organizational and community factors was statistically significant, $\chi2\ (8) = 55.186$, $p < 0.001$ with 36.9% to 51.2% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of not perceiving a risk of HIV transmission with an undetectable viral load explained by the variables in this model. The variables in this model correctly predicted 80% of the outcome of perceiving no risk of HIV transmission. Increased odds of perceiving no risk of HIV transmission were found among those who agreed that members of the same cultural background would believe in the efficacy of HIV treatment and among those who agreed that people in their neighborhood could be trusted. Table 24 provides a summary of the results of the binary logistic regression analysis in the four models (1-3 &5) that were constructed.

Model 6 – Significant factors with the perception of HIV transmission risk with U equals U attitude outcome. When the significant factors from models 1 – 5 were placed in a single regression model, the factors that remained statistically significant with increased odds of perceiving no risk of HIV transmission with an undetectable viral load include: agreement with community cultural beliefs about the effectiveness of HIV treatment compared to those who did not agree; and believing in the accuracy of U equals U. Decreased odds of perceiving no risk were found among those having an alcohol use problem compared to those who had an alcohol SUD. Those who had an alcohol use problem were less likely to believe that there was no risk of transmission. On the other hand, those with alcohol SUD were more likely to believe that there was no risk while controlling for all other demographic, health-related, HIV stigma, and organizational and community/neighborhood factors in the model. Similarly, those who believed in the accuracy of U equals U were 241.780 times more likely to perceive no risk of transmission. This strong independent association was also found with attitude outcome #1 and no transmission risk perception. The factors predicted 92.8% of no perceived risk of sexual transmission of HIV attitude outcome in this model. A significant proportion of the variance, 60.8% to 85.0% (Cox & Snell R Square and Nagelkerke R Square, respectively), of perception of no risk of HIV transmission with an undetectable viral load was explained by the variables in this statistically significant model $\chi 2\ (9) = 116.932$, $p < 0.001$. Table 25 shows a summary of the final logistic regression model for outcome #2.

Attitude outcome #3 – Likelihood of condomless sex and U equals U.

Model 1. – Demographics. In Bivariate analysis, race/ethnicity did not appear to have a statistical significance with the likelihood of engaging in condomless sex ($p = 0.207$; Figure 8). However, having a Bachelor's degree or higher (4.9%) was statistically different from those with

lower levels of education (22.8%) which indicates that they were more likely to have condomless sex with an individual who had an undetectable viral load (Chi-Square test $p = 0.011$). Full-time employment status (13.1%), part-time (55.6%), and not applicable (15.0%) were different in their reported possibility of having condomless sex with a PLHIV who has an undetectable viral load (Likelihood ratio test $p = 0.020$). HIV-positive participants (100%) compared to HIV-negative individuals (14.6%) were statistically significantly different in their likelihood of having condomless sex with a PLHIV who has an undetectable viral load (Likelihood ratio test $p < 0.001$). See Table 26 for the data summary.

The binary logistic model, which included education and HIV status, revealed that 85.7% of the outcome — likely to have unprotected sex with an individual who has an undetectable viral load — was correctly predicted by variables within the model. However, positive HIV status did not remain a statistically significant predictor of this outcome in this model. This could be due to the low number of participants who were positive for HIV. Having a high school diploma and elementary/no formal education had higher odds of indicating a likely response to having unprotected sex with a PLHIV who has an undetectable viral load compared to someone with a Bachelor's degree or higher. Although the model was statistically significant $\chi 2\ (5) = 25.552$, $p < 0.001$, only a small proportion of the variance of the outcome of having condomless sex in the context of U equals U was explained by the variables within the model, 17.5% to 29.0% (Cox & Snell R Square and Nagelkerke R Square, respectively).

Model 2 – Health-related factors. No difference was detected between health-related factors, which included: anxiety screen, depression screen, substance use screen, risky sexual behavior, HIV risk perception, QOL, and social media use, with the outcome of having condomless sex with an individual who has an undetectable viral load. As a result, no regression

analysis was done with these items.

Model 3 – Attitude factors. Table 26 also shows the bivariate analysis for attitude factors. There appeared to be a difference in negative attitudes toward PLHIV score between those who chose likely (mean rank = 50.57) and those who chose unlikely (mean rank = 71.01, p = 0.021) to have condomless sex with a PLHIV and who had an undetectable viral load. Fisher's Exact test showed a significant difference (p = 0.047) in their response to likely engage in condomless sex between those who had positive attitudes, i.e., those who agreed to HIV treatment as prevention (31.0%) and those who disagreed (13.3%). Attitudes toward the accuracy of U equals U and perception of risk of HIV transmission were not found to be associated with the odds of whether a participant was likely to have condomless sex in the context of U equals U.

The two variables in the binary logistic model correctly predicted 80.6% of the outcome, and both remained independently associated with the outcome of being likely to have unprotected sex with an individual who has an undetectable viral load. Decreased odds was seen with higher negative attitude scores toward PLHIV, and higher odds were seen with positive attitudes toward HIV TasP. Participants were 3.840 times more likely to respond as being likely to have sexual intercourse without a condom with a partner who has an undetectable viral load if they were in agreement with the HIV TasP concept. Although the model was statistically significant $\chi 2$ (2) = 11.614, p = 0.003, only a small proportion of the variance of the outcome of having condomless sex in the context of U equals U was explained by the variables within the model, 8.3% to 13.8% (Cox & Snell R Square and Nagelkerke R Square, respectively).

Model 4 – Interpersonal factors. No difference was detected in the outcome of having condomless sex with an individual who has an undetectable viral load with interpersonal factors, which included: perceived social support, experiences of IPV, and knowing a family member

and/or friend diagnosed with HIV. As a result, no regression analysis was done for these items.

Model 5 – Organizational and community/neighborhood factors. A difference was found for the first time between those who agreed that people in their neighborhood generally got along with each other and those who responded that they were likely to have unprotected sex in the context of U equals U (8.7%) versus those who disagreed (26.2%, Chi-Square test $p = 0.008$). All other variables at this level of the SEM did not show any difference in the bivariate analysis in the outcome of having condomless sex with an individual who has an undetectable viral load. The variables included: having a PCP, feeling satisfied with PCP, feeling comfortable with discussing sexual health/HIV issues with PCP, time to commute to PCP, community attitude toward PLHIV, community cultural beliefs about the effectiveness of HIV treatment, community trust in U equals U, perception of risky sexual behaviors by PLHIV, neighborhood trust, fear in neighborhood, gangs as a serious problem in the neighborhood, and accessibility of public transport in the neighborhood. See Table 26.

A binary logistic model with the single variable of getting along among neighbors showed that 83.1% of the outcome was predicted by this variable. The model was statistically significant $\chi 2\ (1) = 7.238$, $p = 0.007$, only a small proportion of the variance of the outcome of having unprotected sex in the context of U equals U was explained by the variable within the model, 5.4% to 9.1% (Cox & Snell R Square and Nagelkerke R Square, respectively). There was a decreased odds of likely having unprotected sex with an individual who has an undetectable viral load among those who agreed that people generally got along in their neighborhood. In other words, those who disagreed with getting along with their neighbors had increased odds of choosing likely as a response for this outcome. This is in contrast to previous models where positive associations were found between more favorable neighborhood factors such as agreeing

to trust among neighbors, and having more positive attitudes toward U equals U outcomes. However, it is similar to the previous finding that revealed those with higher negative scores toward PLHIV (higher stigma) was associated with higher odds of perceiving no risk of HIV transmission (positive U equals U attitudes), although this association did not remain significant in the final model.

Model 6 – Significant factors with the likelihood of engaging in condomless sex in the context of U equals U attitude outcome. This model included education, attitude toward PLHIV score, attitude toward HIV TasP, and people in this neighborhood generally get along, and results can be seen in Table 27. Of these, only attitudes of an agreement to HIV TasP ($p = 0.003$) and neighborhood variable ($p = 0.009$) remained independently associated with choosing likely to have condomless sex within the U equals U context. Those with positive attitudes to HIV TasP were 7.237 times (CI = 1.960 – 26.722) more likely to choose this positive response after adjusting for education, HIV stigma, and neighborhood relationships. Those who agreed to get along with neighbors had decreased odds of choosing a "likely" response to having unprotected sex after adjusting for the other variables mentioned above. The variables in this model predicted 83.7% of the behavioral attitude outcome of having condomless sex with an individual who has an indetectable HIV load. The model was statistically significant $\chi2\ (7) = 25.208$, $p < 0.001$ with 17.8% to 29.6% (Cox & Snell R Square and Nagelkerke R Square, respectively) of the variance of the outcome of having condomless sex in the context of U equals U was explained by the variables within the model.

In summary, 134 women participated in the survey. They were mostly Hispanic, mid-thirties, married, and had a Bachelor's degree or higher. They reported good quality of life as well as good social support and relationship with their intimate partner and PCP. Over two-thirds

of the women were aware of U equals U. Attitudes toward U equals U were mostly negative, with less than half believing that it is accurate, over two-thirds perceiving sexual transmission risks, and 8 out of 10 indicating that it would be unlikely that they would engage in condomless sex with a person who has an undetectable viral load. This is similar to the trend seen in the qualitative study where women indicated that they believed in the U equals U concept but all perceived risk of transmission and said that they would "not risk" having unprotected sex within the context of U equals U. The survey participants mostly agreed that HIV treatment is necessary but a very low proportion (less than a quarter) agreed with TasP.

Final logistic regression (model 6) analyses revealed (sig = $p < 0.05$ and 95% CI):

Attitude outcome 1 – Belief in the accuracy of U equals U, adjusting for other variables in the model,

- among those who had an HIV test, the odds of believing were higher compared to those who have not had an HIV test (OR = 6.336; CI = 1.108 – 36.241; p = 0.038).
- among those who agreed with treatment as prevention (TasP), the odds of believing were much higher than those who disagreed (OR = 7.772; CI = 1.149 – 52.571; p = 0.036).
- those who perceived no risk of HIV transmission in the context of U equals U were 37 times more likely to believe compared to those who perceived risk (OR = 36.836; CI 3.037 – 446.773; p = 0.005).
- those who agreed that people in their community would trust the U equals U concept were about 5 times more likely to believe compared to those who disagreed (OR = 4.949, CI = 1.087 – 22.540, p = 0.039).

Attitude outcome 2 – Perception of no risk of HIV transmission, adjusting for all other

variables in the model,

- among those who screened positive for problem use of alcohol, the odds of perceiving no risk were less compared to those who had a positive screen for alcohol SUD, i.e., people with SUD were more likely to perceive no risk, (OR = 0.023; CI = 0.002 – 0.209; P = 0.001).
- those with favorable cultural community attitudes to HIV treatment were more likely to perceive no risk compared to those with negative, i.e., disagreement, attitudes of cultural trust to HIV treatment (OR = 197.1; CI = 6.332 – 6135.0; p = 0.003).
- among those who believed in the accuracy of U equals U, the odds of perceiving no risk of transmission were much higher compared to those who did not believe (OR = 241.8; CI = 17.70 – 3303.3; p < 0.001).

Attitude outcome 3 – Likely to have condomless sex with a partner who has an undetectable viral load, adjusting for other variables in the model,

- those who agreed that people got along in their neighborhood had lower odds of engaging in condomless sex with an individual who has an undetectable viral load compared to those who disagreed, i.e., people who disagreed were more likely to agree to have unprotected sex, (OR = 0.205; CI = 0.063 – 0.674; p = 0.009).
- among those who agreed with TasP, the odds of engaging in unprotected sex with an individual with an undetectable viral load were seven times higher compared to those who disagreed with TasP (OR = 7.237; CI = 1.960 – 26.72; p = 0.003).

CHAPTER V - DISCUSSION

The purpose of this study was to explore and assess the awareness and attitudes of minority women toward the concept of U equals U in a cross-sectional convergent parallel mixed methods study. Awareness was assessed by the frequency and percentage of women who had heard about U equals U prior to the study. In addition, attitudes were explored qualitatively and assessed quantitatively using the ABC attitude model to define outcome variables along with the SEM as a framework to find associations that may have implications for HIV risk reduction and health promotion. Other theories, such as the Syndemic theory and TRA, also helped to identify and assess important factors that increase HIV risk behaviors and overall HIV risk among minority women.

The results showed that qualitative study participants were similar to the survey participants in that both groups were majority Hispanic and in their thirties with similar proportions born outside the U.S., having an HIV diagnosis, mental health diagnosis, and also high prevalence of SUD. Also, among both groups, perception of HIV risk was low, with more than half of interview participants indicating a medium to low risk and more than half (70.9%) of survey participants getting a score of 20 or below on the HRPS; the median HRPS score (17.0) was also below the mean score (M = 26) reported by the population in which the scale was validated (Napper et al., 2012). Moreover, the median HRTBS score was very low (6.0) among survey participants, similar to that obtained by the validators (Darke et al., 1991). Differences include: survey participants having a higher rate of employment, higher levels of education, living in the U.S. for a greater number of years, and higher reported use of PrEP prescription (among qualitative, none had used PrEP before). Experiences of IPV were higher among interview participants, a higher proportion knew someone living with HIV, and a very high

proportion expressed positive attitudes toward PLHIV. Among survey participants, negative attitude scores were high, with a median score of 25.5 out of a maximum of 45.

Awareness Outcome

Among qualitative study participants, only about a quarter of participants have heard of U equals U before the study, while survey participants self-reports indicated a much higher proportion of awareness (69.0%). This discrepant finding could be due to misconceptions of the survey participants resulting in them mistaking general HIV knowledge as U equals U awareness. This was observed during interviews as several women indicated that they had heard the phrase, but upon further probing, they had not heard it or the concept before. They mistakenly took having heard of general HIV prevention and treatment information in school or health settings as meaning the same thing as U equals U. Survey participants mostly heard of U equals U from their HCP, followed by social media and print media; these results highlight the need for more awareness and education by HCP. Interview participants also reported printed articles, stories and conferences as their source of U equals U information. Similar findings have been seen with online survey participants where a high proportion of U equals U awareness was also found among key male populations (Carneiro et al., 2020). However, historically, studies among minority women have shown low awareness and knowledge of HIV treatment and related topics (Flaskerud & Calvillo, 1991; Misener & Sowell, 1998). Low awareness and knowledge of U equals U was also found in a study from Brazil, where even PLHIV did not know what the concept meant (Torres et al., 2020). This highlights the need for integration of the U equals U message in health education among PLHIV, minority women at increased risk for HIV, and the general population. The need for increased awareness and education regarding HIV-related topics was resounding in the qualitative study as participants strongly felt that this would lead to

greater acceptance of the U equals U message and PLHIV as it would result in breaking down barriers caused by lack of education and prevailing ignorance about the disease in the region. The result of a high proportion of awareness of U equals U among survey participants did not support the hypothesis of low awareness among minority women.

Attitude Outcomes

The hypothesis that factors at all levels of the SEM will associate with attitude outcomes was not supported since none of the interpersonal factors, which included: PSS, IPV, and proximity to someone with HIV, was found to have a difference for any of the three attitude outcomes. Similarly, in the qualitative data, IPV was not mentioned by any of the participants as a factor that may contribute to HIV risk or a factor that may shape attitudes to U equals U. The factors discussed by participants pertained to having multiple partners and cheating partners who unknowingly or potentially could contract HIV and pass it on to their spouses/partners. These were also a few of the main reasons women reported for why they felt at risk for HIV. Attitudes toward U equals U and PLHIV did not differ among interview participants who had experienced IPV versus those who had not. This finding is unexpected since the literature has shown an association between IPV and HIV risk among women (Batchelder et al., 2016), which could potentially impact their attitudes.

In addition, the behavioral attitude to likely engage in condomless sex with an individual who has an undetectable viral load was also not found to have any difference between any individual health-related factors such as anxiety, depression, HRPS, HRTBS, TAPS, QOL, and social media use. This highly unexpected finding could be due to the small sample size and the high proportion of survey participants who reported unlikely (82.8%) vs. likely (17.2%). In another vein, these results could also be due to behavior predicting attitudes, as is seen in some

health promotion models, such as the TPB. This finding of unwillingness to engage in unprotected sex is congruent with the finding from the qualitative study where only about three participants elaborated on their unwilling responses to add that if it was with a long-term partner, "someone I love," or someone to "have a family" with then they would consider having condomless sex because they would have more confidence in the individual adhering to their medication and achieving and maintaining an undetectable status.

Another unexpected result, however similar to the qualitative findings, is that demographic factors such as race, age, education, religion, nativity, and sexual orientation were not associated with any of the attitude outcomes in the final regression models. Being married and heterosexual (straight) were the only demographic factors that were significant in the first model but the association did not remain statistically significant with beliefs about the accuracy of U equals U in the final model. These findings did not mirror that of the qualitative since attitudes expressed in this segment were differed by education level. In the interviews, most women who were aware of U equals U and expressed belief in the concept had a Bachelor's degree or higher, and two of these women were among the few who said they would consider the possibility of engaging in condomless sex with an established partner. One of the participants who expressed that she had vocational training as a nurse's aide shared that through her job, she became more aware of HIV and less stigmatizing toward PLHIV.

Demographic factors such as marital status and sexual orientation predicted beliefs in the accuracy of U equals U only in the demographic model but not in the final model. Although being of the Black/African American race showed a higher likelihood of believing in the accuracy of U equals U and perceiving no risk of HIV transmission compared to Hispanics, these findings were not statistically significant. This, however, is contrary to what was found by

Torres et al. (2020), where those identifying as Black were less likely to believe in the accuracy of U equals U but similar to the study by Carneiro et al. (2020) that found Latinx were more likely to not trust the concept. Race was significant at the bivariate level only for both of these attitude outcomes but not for the likelihood of engaging in condomless sex behavioral attitude outcome. Similarly, age was the only demographic predicting perception of risk of HIV transmission in the demographic model, with increased age being more likely to perceive no risk, in contrast to the findings among SMM where younger ages were found to be more likely to trust U equals U (Carneiro et al., 2020). However, in the final model, age did not remain statistically significant, with the odds of not perceiving the risk of HIV transmission. Other variables that showed a difference between the perception of risk and no risk at the bivariate analysis level included race, marital status, education, religion, sex, current work status, income, birth country, HIV test status, PrEP use, and U equals U awareness.

Furthermore, the hypothesis that community-level factors will have stronger associations with attitudes toward the beliefs in the accuracy of U equals U was also not supported since only one of the four factors that remained statistically significant with this attitude outcome was at community-level, while the other three were individual factors which included, HIV test status, attitudes toward HIV TasP and perceived risk of HIV transmission with U equals U. Similar associations were found in other studies with attitudes to U equals U and HIV test history (Rendina & Parsons, 2018; Torres et al., 2020), and attitudes to treatment (Kalichman et al., 2016). Agreeing that members of the community would trust U equals U resulted in a 5-fold increase in the odds of believing in the accuracy of U equals U. However, believing that there was no risk of HIV transmission had the strongest association in the final model, with an odds ratio of 36.836 (CI = 3.037 – 446.773, p =0.005). Community-level attitudes toward U equals U

were mostly negative in the qualitative study with 42.9% of participants indicating a negative community response; a similar proportion (47.6%) indicated that they did not believe in the concept. The community-level influence on beliefs in the accuracy of U equals U are similar to those found in other studies that explored attitudes to biomedical HIV prevention (Bazzi et al., 2018). This finding is also supported by the premise that social and cultural norms influence attitudes as seen in the TPB.

Among survey participants, less than half (47%) thought that U equals U was completely accurate, even less thought that there was no risk of transmission (32.8%) and an even lower proportion reported that they were likely to engage in condomless sex (17.2%). These are lower than the findings of Rendina, et al. (2020). However, the relationship between belief in the accuracy of U equals U and the perception of risk of transmission was similar, where an increase in beliefs resulted in higher odds of perceiving no risk of transmission and visa-versa (Rendina et al., 2020). Although these two variables were in sync, still the third outcome showed that there was still a lack of trust in the concept among the minority women since they were unwilling to engage in condomless sex within the context of U equals U. The qualitative study supported this lack of trust in the U equals U concept as all the women reported that they believe that there is still a risk of transmission, even though they believed in the concept, they would "not risk it." The belief in U equals U's accuracy was also low (33.3%) among interview participants.

Those who agreed with TasP had higher odds of believing in the accuracy of U equals U than those who disagreed (OR = 7.772; CI = 1.149 – 52.571; p = 0.036). A very small proportion (21.6%) agreed to TasP; however, a much greater proportion (80%) agreed that treatment was necessary among survey participants. Similar results were obtained regarding attitudes toward TasP in a study among SMM men (Holt et al., 2014). Similarly, in the qualitative portion of the

study, almost three-fourths of the women (71.4%) had only positive attitudes toward HIV treatment, with another 19.1% expressing mixed attitudes. They reported that treatment would make people live longer, have a normal life, and be like everyone else from a medical perspective of treatment. However, their unwillingness to engage in sexual activity within the context of U equals U shows that the interview participants also do not understand nor endorse the TasP concept from a public health standpoint, although they were not asked this question directly. A few participants mentioned that with the achievement of an undetectable status, PLHIV could feel free to do the things that they always wanted to do in a positive sense. TasP is a very important biomedical approach to effectively reduce the prevalence and incidence of HIV (Vermund et al., 2013; Warren et al., 2018). Making the TasP model more conspicuous through public health professionals and through readily accessible public health information/data could result in more transparency and awareness of the benefits of HIV TasP (Holt et al., 2014). One interview participant believed that health professionals could do more to publicize the concept and felt that they were deliberately hiding the information for selfish gain, while other participants had many other conspiracy theories about an HIV cure that is supposedly being hidden. One study in Africa found similar results where healthcare professionals admitted not telling patients about TasP and U equals U out of fear that they would be held responsible for any transmission (Ngure et al., 2020).

Those who have had an HIV test had higher odds of believing compared to those who have not had an HIV test (OR = 6.336; CI = 1.108 – 36.241; p = 0.038). Belief in U equals U was low among interview participants. Many also indicated that they have never had an HIV test despite disclosing engagement in high-risk behaviors such as having unprotected sex with multiple partners, being IDUs, being sex workers, and being trafficked and raped. The frequency

of HIV testing was a subtheme in the qualitative data and was frequently done as part of routine gynecological checkups by participants, which also brought about some discussion about their STD experiences. A few participants indicated that they get tested frequently. Fear of HIV often surfaced in the conversations among those who test frequently and those who have never had an HIV test. One participant disclosed that she had not done an HIV test because she was afraid of the result — of being told she had a disease. Within the dynamics of the fear of HIV discussions, the women revealed their general awareness of the established routes of HIV transmission, such as sexual contact (unprotected), IDU, transfusion, and MTCT, but some misconceptions of transmission through saliva, toilet seat, mascara, spoons, straws, and kissing were mentioned among interview participants. The overall trend of lower odds of believing among those who have never had an HIV test and the misconceptions that are still prevalent among minority women means that there remains a great gap in public health education and health promotion to encourage minority women, especially those with higher risk, to get tested for HIV and to become knowledgeable of the risks for HIV and the routes of transmission. More importantly, public health programs and infectious disease health professionals can target HIV testing opportunities to educate minority women at risk and those living with HIV about the concept of U equals U since most survey participants reported hearing about the concept from their HCPs. Social media sites can also be avenues to dispense information since sites such as Facebook can be tailored to a targeted audience. Moreover, the majority of the survey participants (83.8%) reported that they have one or more social media accounts, and a similar proportion spend greater than 30 minutes a day on social media.

The hypothesis that individual factors will have a stronger association with sexual behavior and perception of HIV risk in the context of U equals U was supported. Perception of

HIV risk in the context of U equals U was found to have independent associations with many individual factors as well as community and neighborhood factors in the initial regression models but only alcohol SUD, belief in the accuracy of U equals U (both individual factors) and cultural beliefs about HIV treatment at the community level remained statistically significant in the final model. However, individual beliefs in the accuracy of U equals U had the highest odds of perceiving no risk of transmission (OR = 241.8; CI = 17.70 – 3303.3; $p < 0.001$). Similarly, for engagement in condomless sex, it was the individual beliefs in the HIV TasP that resulted in 7-fold increased odds of engaging in condomless sex. In the qualitative segment, similar findings were seen where individual factors prevailed to shape their beliefs about HIV transmission risk and unwillingness to engage in condomless sex within the context of U equals U. One woman said she just wouldn't chance it, while another said, "I wouldn't still trust it. I wouldn't because it, it's just the simple fact of it being HIV."

Community-level factors such as trust in the effectiveness of HIV treatment followed in the strength of association for HIV transmission risk perceptions. Those who agreed that members of the same cultural background would trust in the effectiveness of HIV treatment were 197 times more likely to perceive no risk compared to those who disagreed (OR = 197.1; CI = 6.332 – 6135.0; $p = 0.003$). Community attitudes among survey participants were much more positive than among interview participants. For example, more than half (57.6%) of survey respondents agreed that people of their cultural background would think that HIV treatment was effective, 46.6% reported that community members would trust U equals U, and only 37.1% thought that community members would perceive risky behaviors by PLHIV and having an undetectable status compared to only 33.3% of interview participants who indicated that their community members would have a positive attitude toward U equals U. Interview participants

generally expressed greater negative attitudes toward U equals U and PLHIV at the community level citing factors such as lack of knowledge, Hispanic culture, "the way they grew up," being "set in their ways," not being able to move on from their past knowledge, experiences, and fear of HIV. Some just thought that it was because some people did not want to accept that there was advancement in HIV treatment and care. They had much more positive attitudes toward PLHIV and U equals U at the individual level. Social desirability bias could have influenced interview participants to portray their personal beliefs more positively than the community beliefs. Another observation supporting this position is that many women used the second or third-person voice when talking about why they felt at risk for HIV during the interviews and had to be asked to clarify whether they engaged in or experienced the things they were mentioning. For example, one participant said, "… there are a lot of men and women … they meet for sex nowadays." Another said, "You're exposed to a lot of drugs … even sex trafficking." On the other hand, the women were very open about how they felt about U equals U and the risk of transmission. Many spoke about their own negative experiences with family and community members as they struggled with SUD, and they equated these experiences to what they might face if they were to get HIV.

As previously discussed, among those who believed in the accuracy of U equals U, the odds of perceiving no risk of transmission were much higher than those who did not believe (OR = 241.8; CI = 17.70 – 3303.3; $p < 0.001$). This showed reciprocity and congruence between believing in the accuracy of U equals and believing there is no risk of transmission; however, it did not influence willingness to engage in sex with an undetectable partner. This firm unwillingness to engage in condomless sex with an undetectable partner was found in both quantitative and qualitative data and is supported by the literature (Carneiro et al., 2020; Rendina

et al., 2020). This finding supports the theory that attitudes do not always predict behaviors, but behaviors predicate attitudes (Ajzen, 1991). This area would require further exploration and research among women at risk of HIV. One possible explanation could be that the women were generally unaware of the concept and did not understand it adequately enough to make an informed decision. This was supported since participants with more awareness and education about U equals U did not exclude condomless sex as a possibility within the dynamics of an established relationship. However, the validity of this claim was also questionable since the possibility of starting a relationship with a known PLHIV or continuing a relationship where a partner contracted HIV is highly unlikely, in the researcher's opinion. The complex message of U equals U cannot fully be understood or accepted by minority women until TasP is established as a proven preventative strategy among the general population, similar to the widespread promotion of physical protection like condoms (Bazzi et al., 2018; Holt et al., 2014). In hindsight, promoting U equals U before promoting TasP is like "putting the cart before the horse." TasP can be promoted in simple language, producing visible and measurable results that the public would better receive. The U equals U message can be built up once TasP is solidified as an HIV prevention strategy. Interview participants shared similar views as they talked about needing to see proof of couples who had success with this concept and building trust in the science behind it. They also mentioned using clearer, simpler terms for promoting the U equals U message and the need for communication and dispensing of HIV-related information, as one participant thought that HIV "it's more like a forgotten disease."

The likelihood of having unprotected sex in the context of U equals U was explained by attitudes toward TasP and people generally getting along in their neighborhood. Among those who agreed with TasP, the odds of engaging in unprotected sex with an individual with an

undetectable viral load were seven times higher compared to those who disagreed with TasP (OR = 7.237; CI = 1.960 – 26.72; p = 0.003). It is important to note that attitudes toward HIV treatment both at the individual and community levels influenced higher odds of positive U equals U attitude outcomes in this study. This adds to the argument for promoting TasP on a public health scale for the community members to become aware and knowledgeable of this strategy which could increase understanding and acceptance of the U equals U message when it follows this concept. In addition, those who agreed that people get along in the neighborhood had lower odds of engaging in condomless sex with an individual who has an undetectable viral load compared to those who disagreed, i.e., people who disagreed were more likely to agree to have unprotected sex, (OR = 0.205; CI = 0.063 – 0.674; p = 0.009). This finding cannot readily be explained because previous results showed that those with favorable beliefs about their neighborhood were more likely to agree with positive U equals U outcomes. One possible explanation would be that participants equated people getting along in their neighborhood to mean widespread unprotected sexual activity thus, fearing getting HIV through unprotected sex with PLHIV. This seemingly contradicting result could be explained by the qualitative data where participants expressed widespread sexual activity among random men and women and sharing needles at "tattoo parties." This result is similar to one study with SMM that found that increased HIV testing (positive outcome) was associated with living in more disadvantaged neighborhoods (negative factor). However, the underlying influence was the proximity to AIDS Service Organizations (Bauermeister et al., 2015). The psychosocial, behavioral, and physical neighborhood settings are important influences on HIV-related behaviors and health outcomes (Latkin et al., 2013). The setting mostly described by interview participants in the current study was online/virtual settings where men and women meet on social media sites and dating apps

and arrange sexual encounters. Therefore, the dynamics within the neighborhood, and by extension, the virtual setting, may affect minority women's risk differently than other groups (Latkin et al., 2013). The neighborhood relationship mechanisms, however, are not fully understood, and thus being less likely to engage in sexual activity within the context of U equals U while believing that people generally get along in the neighborhood would require further research and analysis as it is unexpected and contrary to other findings within the study.

Finally, the themes found in the qualitative data were mostly similar to the findings in the survey data. There were awareness and unawareness in both; discrepancies between beliefs, perceptions, and behaviors were evident in both; both showed mixed attitudes toward PLHIV and U equals U; and evidence of stigma and discrimination of PLHIV were present in both types of data. Differences between the study groups were seen for the level of awareness of U equals U and attitudes toward PLHIV. Interview participants were much less aware of U equals U and much more positive toward PLHIV. Individual belief in the accuracy of U equals U and perception of HIV transmission and willingness to engage in unprotected sex were similar between the study groups, with less than half believing in both groups and 100% of qualitative and 67.2% of quantitative perceiving risk and almost all being unlikely to have sexual contact unprotected in both segments. Community attitudes were more favorable among survey participants, with cultural attitudes to HIV treatment being one of the factors that significantly predicated perception of no risk of transmission within the context of U equals U. Having an HIV test, having an alcohol SUD, disagreeing with neighbors get along, and most importantly, having positive individual and community attitudes to HIV treatment were all significant predictors of positive U equals U attitudes.

Implications and future directions

Minority women, especially Black/African American and Hispanic women, continue to be at high risk for acquiring HIV. Combined, they make up about 75% of all new HIV cases among women annually in the U.S (Kaiser Family Foundation, 2020c). This shows the need for HIV-related health education and prevention among this population, especially those at higher risk. Attitudes influence health promotion and risk behaviors (Ajzen & Fishbein, 2005). The ABC model of attitude shows that there are three aspects: affective, behavioral, and cognitive (Breckler, 1984). Within this study, the affective attitude was measured by the perception of risk of HIV transmission, behavioral was measured by willingness to engage in condomless sexual activity within the context of U equals U, and cognitive by participants' beliefs in the accuracy of U equals U. Attitudes are shaped by internal and external environments/factors (Bakanauskas et al., 2020). The SEM, which was used to examine these multidimensional factors (Baltes, 1976; Bronfenbrenner, 1977) and their relation to the affective, behavioral, and cognitive attitudes, showed that attitudes toward the U equals U concept were mostly shaped by individual factors. Cognitive attitudes or beliefs in the accuracy of U equals U were shaped by affective attitudes, perception of HIV transmission risk within U equals U, beliefs about the efficacy of HIV treatment to prevent transmission, and having an HIV test. These results were supported by the qualitative data as well. Those with higher education were more aware of U equals U, although awareness, in general, was low among qualitative study participants. The results showed a great need for the promotion of biomedical HIV prevention and HIV-related education among minority women in the El Paso, TX region. This education must be designed to reach minority women at risk, and those with low SES, as these women were much less likely to know about the U equals U concept or use PrEP, despite them engaging in high-risk behaviors.

Moreover, data show that a small proportion of minority women utilize PrEP (Huang, Zhu, Smith, Harris, & Hoover, 2018). Within this biomedical prevention curriculum, not only must PrEP be addressed, but also TasP must be clearly communicated and emphasized to ensure understanding, acceptance, and trust of the U equals U message (Holt et al., 2014). Studies have shown that women are open to learning and trying biomedical prevention methods (Bazzi et al., 2018), but lack of awareness/knowledge and low perception of HIV risk are a few of the individual barriers, in addition to structural barriers, that prevent uptake of these methods (Biello et al., 2018). Many of the women in the current qualitative study expressed a low perception of HIV risk, lack of HIV testing, and lack of PrEP use while perceiving a high risk of transmission with U equals U. An integrated approach is needed to increase HIV testing and provide biomedical HIV prevention education during the test visit. Culturally sensitive strategies are also needed since quantitative data show that Hispanics were less likely to believe in the accuracy of U equals U compared to Blacks/African Americans, although it was not a statistically significant finding in the final regression model. However, interviewees expressed cultural barriers to U equals U that was secondary to a lack of knowledge and education. These show the significance of culture in this geographical region, from a public health perspective, in shaping beliefs in the accuracy of U equals U and attitudes toward PLHIV. Religion, education, sexual orientation, and marital status were associated with believing in the accuracy of U equals U at the bivariate level but not in the final regression model. Also, a higher proportion of heterosexuals compared to homosexuals and bisexuals and people who were aware of U equals U compared to those unaware also appeared to believe in U equals U more. A larger study may be needed to obtain better insights into the relationships that may exist with these factors and attitudes toward U equals U. Age, country of birth, and HIV status did not have any difference in beliefs about U

equals U accuracy. Interviewees mirrored this finding since, among these participants, only one was HIV positive, but the overall belief in the accuracy of U equals U was low regardless of age, ethnicity, or country of birth. However, findings from a larger longitudinal study with SMM revealed that belief in the accuracy of U equals U was associated with HIV status (Rendina & Parsons, 2018), supporting the need for a larger study among racial/ethnic minority women.

Furthermore, the Syndemic theory identifies several specific factors such as SUD, IPV, mental illness, and low SES that place minority women at risk for HIV (Batchelder et al., 2015) and which may also shape their experience and attitudes (Breckler, 1984). In the study, screening positive for anxiety and depression, having an alcohol SUD and an increased score on the HRTBS but not IPV were associated with believing in the accuracy of U equals U only at the bivariate analyses level. These associations did not remain in the final regression model. Women in the qualitative portion of the study also did not mention IPV or mental illness as risk factors. In fact, some of the interview participants recognized that SUD, particularly IDU, was a risk factor for HIV acquisition, but the majority insisted that their risk was low. Survey participants also had low scores on the HRTBS (which included an IDU scale; median = 6.0) and low perception of HIV risk (median = 17.0). However, alcohol use (53.7%) and illicit drug use (24.6%) were prevalent. The high level of PSS (median = 22) and good QOL (60.4%) reported by survey participants and the support received by interview participants at local CBOs probably played a role in increasing resiliency and reducing the level of perceived HIV risk among participants (Batchelder et al., 2015), since some of the women made statements in reference to being in a facility, therefore evaluating their risk as low. These interactions probably also diminished the associations of these factors with attitudes toward U equals U, although these interactions were not tested. Moreover, these findings highlight the need for interventions that

inform racial/ethnic minority women about the risks that IPV and mental illness predispose them to, especially in a community where IPV (TDPS, 2018a) and mental illness (Health Management Associates, 2020) exist among vulnerable populations, such as the women in this study who had higher rates of both. Future studies can further explore the interactions of risk perception, resilience, and attitudes toward U equals U among racial/ethnic minority women living in the El Paso, TX region.

The affective attitude — perception of no risk of HIV transmission with U equals U — was related to individual alcohol SUD and belief in the accuracy of U equals U, and at the community level with cultural attitudes to HIV treatment, i.e., belief in the efficacy of HIV treatment. Community trust in U equals U also had a statistically significant impact on belief about the accuracy of U equals U. These findings highlight the need to promote the TasP model and the U equals U as scientifically sound concepts to the general populace and among communities of different cultural backgrounds and identities (Torres et al., 2020). Historically, Hispanic communities were drawn to more traditional healing methods (Flaskerud & Calvillo, 1991), but later studies show an improvement in attitudes toward HIV treatment (Schrimshaw et al., 2005). The results of this study show that almost all interview participants and 80% of survey participants, the majority Hispanic, believed in the medical benefits of HIV treatment. The positive health outcomes can be paired and transposed with TasP and U equals U outcomes to demonstrate the parallel benefits of improved health outcomes, decreased viral load, and decreased risk of transmission of HIV. Culturally sensitive infographics, pamphlets, and pocketbooks disseminated through infomercials, commercials, bulletin boards, health fairs, and social media posts targeting residents in the El Paso, TX region will be helpful to increase belief in TasP and U equals U to a similar level as belief in treatment is medically necessary.

The behavioral attitude of engaging in condomless sex within the context of U equals U was related to the attitude toward HIV TasP and disagreeing that people get along in their neighborhood. All three outcomes were related to the attitudes toward HIV treatment. Solidifying the need for widespread dissemination of the TasP concept and the U equals U message together. Ironically, there was no association between the likelihood of engaging in condomless sex and any of the other two outcomes. In this case, what they believed about U equals and how they felt about risk did not influence their behavior statistically, given the sample size and variables within the model. But from a pragmatic perspective, the perceived risk of transmission definitely impacted the participant's unwillingness to engage in condomless sex with an individual who has an undetectable viral load. The words of one interview participant sum up the general attitude of participants, "I believe it. But I wouldn't chance it." All the interview participants believed there was a risk for HIV transmission even if the partner has an undetectable viral load and even if they believed the concept was accurate. This again highlights the need for public health education regarding the science and implications for TasP and U equals U. This outcome was the only one to seem to have a difference by HIV status at the bivariate level, where those with HIV seemed to be more likely to engage in condomless sex, similar to findings in Rendina et al., (2020) and Carneiro et al., (2020) but this association did not remain in the regression models. A larger sample of PLHIV would have probably revealed a significant relationship. Having a high school education/no formal education also seemed to have an association at the bivariate level, but this also did not remain. Views about increased high-risk behaviors within neighborhoods where people get along well could possibly be an explanation for the association seen with this attitude outcome. Racial/ethnic minority women's

attitude to U equals U may also be shaped by other neighborhood characteristics not measured in the study. However, this will require further investigation.

It is important to note that none of the interpersonal factors and organizational factors were found to be related to any of the attitude outcomes in this study in the final regression models. Also, community attitudes about RSBs among PLHIV with an undetectable viral load did not have any relationship with any of the outcomes. This was mirrored by the qualitative responses where only one participant cited the possibility of risky careless behavior by PLHIV with an undetectable viral load — her justification for rejecting the promotion of the U equals U message in the region. However, one study found that it was a major concern among HCP (Ngure et al., 2020). Further investigation is needed to determine why participants felt a subjective risk of transmission but not community-wide risk due to RSBs by PLHIV with an undetectable viral load. Having a PCPC was only statistically significant at the bivariate level with beliefs in the accuracy of U equals U and perception of risk of transmission, but the associations did not remain. Perhaps these individuals' PCP discussed the concept of U equals U with them, thereby resulting in more favorable attitudes. A few community and neighborhood factors were also associated with these two outcomes in the bivariate analysis, but they also diminished once the variables were added to the regression models. The general trend showed positive U equals U attitude outcomes among those with positive community and neighborhood attitudes. Therefore, increasing factors such as community attitudes toward PLHIV, community trust in U equals U, positive view of sexual activity of PLHIV who have an undetectable viral load, trust in the neighborhood, feeling safe in the neighborhood, and access to transport in neighborhoods can potentially have an impact on positive attitudes toward U equals U.

Limitations and strengths

One major limitation of the study was the sample size for quantitative data analysis due to time constraints. The small sample size greatly reduced the power of the study and the relationships that could be detected. As a result, the quantitative findings may have increased non-response bias which limits the generalizability of the study findings. A major strength of the study is that it included racial/ethnic minority women, majority Mexican American, in the border region. However, this could also be seen as a limitation to generalizability to racial/ethnic minority women in other regions. In addition, the majority of the participants appeared to have a high risk of HIV due to SUD, which could have been due to participant selection bias due to non-random sampling. The attitudes of these women may be different from women of other racial/ethnic backgrounds not included in the study and could be a result of selection bias. Women seeking help at CBOs may have different levels of risk for HIV and also different attitudes toward TasP and U=U than those not seeking help which also limits the application of findings to the racial/ethnic minority women at risk for HIV in the study. Most participants were of lower education background, and they had challenges in understanding questions and responding coherently during interview sessions. Their position was ambiguous at times and added to the time to analyze the qualitative data. The attitudes expressed by the at-risk women may differ from WLHIV since they do not have the personal experience of dealing with the multidimensional challenges that come with living with HIV, and therefore findings cannot be generalized to the community of WLHIV or PLHIV. Recall and social desirability biases could have impacted responses in both parts of the study as all measures were self-reported and subjective. Data were collected without the help of mental health or SUD professionals, and

neither were trained practitioners in these fields involved with data analysis; therefore, results for these factors should be interpreted with caution.

One major strength of the study was the qualitative data which provided richer data to explore this phenomenon among racial/ethnic minority women for the first time in the study priority communities in the US-Mexico border region. The convergent mixed methods design also strengthened the validity of the findings. However, this approach to data collection was time-consuming, given its complex nature. Furthermore, hypothesis testing on empirically derived observations/data in a sequential manner was not possible. A pilot test of the survey instrument was done online but not in person due to time constraints, which resulted in high proportions of missing data for multiple independent variables within paper surveys due to the layout of tables. Difficulties in recruitment prolonged the timeline of data collection and the completion of the study, which also affected the sample size for the interview. All instruments used in the survey study had good psychometric properties in their validation studies. Reliability testing of the scales in the current study showed similar values, however, results could have been influenced by the small sample size and other research-related biases. Therefore, these psychometric results should be interpreted with caution due to difference among the population of interest and other study groups. Based on the literature review, this study was one of the first few studies to explore the U equals U concept among racial/ethnic minority women in the U.S.-Mexico border region.

CHAPTER VI – CONCLUSION

The majority of the participants in both study segments (qualitative and quantitative), were majority Hispanic and in their early to mid-thirties. Individuals who participated in the qualitativeinterviews had a lower level of education, higher unemployment rate, and higher prevalence of SUD and IPV.

Specific Aim 1

The results of the study showed that interview participants had low awareness of U equals U, with only about a quarter (23.8%) of participants being aware of this concept. Those who were aware were more likely to have a Bachelor's degree or higher. All those who expressed awareness of U equals U indicated that they believed in the accuracy of the concept. However, awareness did not result in a difference in perceived risk of transmission of HIV within the context of U equals U. Belief in the U equals U concept was generally low among interview participants, with only one-third indicating that they believed. With the exception of about three women who reported that they would consider engaging in a sexual relationship with an individual with an undetectable viral load. Major themes that emerged from the qualitative data were: Awareness of U equals U and HIV-related issues, 2) Unawareness, lack of knowledge, and misconceptions of U equals U and HIV-related issues, 3) Discrepancy between beliefs, perceptions, and behaviors regarding U equals U and HIV risk, 4) Positive attitudes toward U equals U and PLHIV, and 5) Stigma, fear and discrimination related to U equals U. Subthemes that emerged include HIV risk levels, lack of HIV testing, STD experience, other's HIV experience, personal vs. community stigma, normal life and identity, Hispanic moms and dads (cultural norms), and barriers to U equals U. The findings indicate that racial/ethnic minority women at risk for HIV would benefit from public health education outreach to increase

awareness of HIV-related topics, especially TasP and U equals U. Integrated interventions that combine HIV testing with information/education would be more effective.

Specific Aim 2

Quantitative participants were more aware of U equals U than interview participants. Since awareness was relatively high among survey participants (69.2%), the hypothesis of low awareness among at-risk minority women was not supported. Although awareness of U equals U appeared to be associated with beliefs in the accuracy of U equals U and perception of no risk of HIV, the strengths of the associations were not sustained in regression analysis.

Specific Aim 3

In the analysis of attitude outcomes with SEM factors, three out of four statistically significant factors associated with cognitive beliefs in U equals U were at individual level and one community-level; one community factor and two individual factors were associated with affective attitudes toward U equals U; and one neighborhood and one individual factor were associated with the behavioral attitude outcome. Therefore, the hypothesis that factors at all levels of the SEM would be associated with the attitude outcomes was not supported since none of the interpersonal factors was related to any of the outcomes, neither in bivariate nor regression analysis. In addition, none of the health-related variables at the individual level was associated with the likelihood of engaging in condomless sex within the context of U equals U. The second hypothesis that community factors would have stronger associations with beliefs about the accuracy of U equals U was also not supported since perceptions of HIV risk had higher odds compared to the community factor (trust in U equals U) that remained significantly associated with this outcome. The factors that increased the odds of believing in the accuracy of U equals U include: having ever received an HIV test (6.336 times higher), agreeing to HIV TasP (7.772

times higher), perceiving no risk of HIV transmission with an undetectable viral load (36.836 times higher), and trusting in U equals U at the community level (4.949 times higher). The general trend that appeared in the bivariate analysis was that increase in positive community attitudes had higher proportions who believed in the accuracy of U equals U. Again, the integrative HIV services with testing and education of HIV risk factors, HIV routes of transmission, misconceptions of HIV, medical benefits of treatment, TasP and U equals U would help to close the gap in awareness and knowledge of biomedical HIV prevention and improve acceptance of U equals U throughout the community.

The third hypothesis that individual factors will have a stronger association with sexual behavior and perception of HIV risk in the context of U equals U was supported since those who believed in the accuracy of U equals U were 241.8 times more likely to perceive no risk of transmission with U equals U followed by positive community cultural attitudes to HIV treatment efficacy with 197.1 times more likelihood of perceiving no risk of transmission. Among participants who agreed with HIV TasP, the odds of engaging in unprotected sex with an individual with an undetectable viral load were seven times higher compared to those who disagreed with HIV TasP. These were statistically significant. Those with problem use of alcohol were less likely to perceive no risk of transmission compared to those with an alcohol SUD; while those who agreed that people get along in their neighborhood were also less likely to report that they would have condomless sex with an individual with an undetectable viral load. These individual factors greatly influenced attitudes to U equals U; however, community beliefs about HIV treatment played a major role in attitudes toward U equals U. Therefore, interventions must include educating women of lower SES, those with varying levels of HIV risk, and also be culturally appropriate and widespread in the community to have an impact

among racial/ethnic minority women and the community members in the El Paso, TX border region. Finally, further research is needed to explore the mechanisms and impact of neighborhood relationships with attitudes toward U equals U with these factors. A larger study may be able to identify relationships that were not picked up due to lack of sensitivity from this study, in particular with interpersonal and organizational level factors.

Specific Aim 4

Awareness of U equals U among quantitative participants was higher than among interview participants. The women were generally aware of HIV risk factors and routes of infection. However, the majority were unaware of U equals U among interview participants, and they held some misconceptions about HIV transmission, such as through mascara and eating utensils, and conspiracy theories about HIV treatments, i.e., that there is a cure for HIV. On the other hand, the women were unaware of factors that increase their risks, such as IPV and mental illness. They also held discrepant beliefs about their HIV risk being low, however having a history of engagement in high risk-behaviors such as having a SUD, IDU, and sex work. Receiving help from a local CBO could be one factor that skewed the women's perception of risk. There were also low levels of HIV risk perception reported by survey participants and they also had low scores on the HRTBS; however, alcohol SUD was high among these participants. Perception of risk with U equals U was high among both groups and a small amount of both segments agreed to have unprotected sex in the context of U equals U. The participants had positive attitudes toward U equals in that they believed that HIV treatment and U equals U could help PLHIV to live a normal life and to live longer; to feel liberated and be able to do the things they want as anyone else. However, this positive attitude was from a medical standpoint in both types of data and not toward TasP. Interview participants had an overwhelmingly positive and

sympathetic tone toward PLHIV, while negative attitudes were more prevalent toward PLHIV at the community level in both, with over half of survey participants agreeing that people in their community would not buy vegetables from PLHIV. In addition, fear of HIV transmission and stigma toward PLHIV remained high even with U equals U, which was evident by the unwillingness to engage in condomless sexual activity with an undetectable partner by both groups of participants. According to interview participants, fear and stigma would be seen mostly among family and community members because of "ignorance" and "the way they grew up." They recounted their negative treatment by family members with their SUD and relayed that they would expect similar or worst treatment if they were to acquire HIV. The participants greatly endorsed the promotion of the U equals U message in the El Paso, TX region.

The key finding from this study is that positive attitudes toward HIV treatment, i.e., TasP at the individual level, increased the odds of believing in the accuracy of U equals U and the likelihood of engaging in condomless sex with an undetectable partner; and at the community level (among members of the same cultural background), believing that treatment makes people healthier increased the odds of perceiving no risk of HIV transmission with U equals U. An integrated HIV education and testing service model will lead to acceptance of TasP and U equals U among racial/ethnic minority populations in the border region of El Paso and could greatly decrease HIV stigma toward PLHIV through normalization of HIV as a controllable chronic illness. Understanding U equals U may also lead to increased communication about its benefits among community members resulting in better health outcomes for PLHIV.

Timeline

After a successful proposal defense in May 2021 and further protocol and instrument review by committee members, the IRB application was submitted in July 2021. IRB approval

was expedited and initial approval was granted at the end of September 2022. Recruitment and data collection commenced in October 2021 and was conducted until June 2022. Although a pilot study was planned, it was briefly done for the online surveys only. Transcription and data analysis commenced immediately for the interviews, which started in November 2021 and were completed in June 2022, while quantitative data analysis procedures were completed in November 2022. Final dissertation writing commenced in May 2022 through November 2022. Findings from the study will be disseminated through research articles and conferences.

REFERENCES

30 for 30 Campaign. (2012). Briefing paper: Ending HIV-related health care disparities for women. Retrieved from https://www.hivlawandpolicy.org/sites/default/files/30for30_disparities_final.pdf

Aaron, E., Criniti, S., Bonacquisti, A., & Geller, P. A. (2013). Providing sensitive care for adult HIV-infected women with a history of childhood sexual abuse. *The Journal of the Association of Nurses in AIDS Care : JANAC, 24*(4), 355-367. doi:10.1016/j.jana.2013.03.004

Aberg, J. A., Gallant, J. E., Ghanem, K. G., Emmanuel, P., Zingman, B. S., & Horberg, M. A. (2013). Primary care guidelines for the management of persons infected with HIV: 2013 update by the HIV Medicine Association of the Infectious Diseases Society of America. *Clinical Infectious Diseases, 58*(1), e1-e34. doi:10.1093/cid/cit665

Adih, W. K., & Alexander, C. S. (1999). Determinants of condom use to prevent HIV infection among youth in Ghana. *The Journal Of Adolescent Health: Official Publication Of The Society For Adolescent Medicine, 24*(1), 63-72.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology, 52*(1), 27. doi:10.1146/annurev.psych.52.1.27

Ajzen, I. (2005). *Attitudes, personality, and behavior*: McGraw-Hill Education (UK).

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*(5), 888-918. doi:10.1037/0033-2909.84.5.888

Ajzen, I., & Fishbein, M. (2005). The Influence of Attitudes on Behavior. In (Vol. 173, pp. 173-221).

Alexandra Isabel Cabral da Silva, G., & Maria Cristina Salgado, N. (2018). Predicting Condom Use: A Comparison of the Theory of Reasoned Action, the Theory of Planned Behavior and an Extended Model of TPB. *Psicologia: Teoria e Pesquisa, 33*(0). doi:10.1590/0102.3772e33422

Althoff, M. D., Theall, K., Schmidt, N., Hembling, J., Gebrekristos, H. T., Thompson, M. M., . . . Kissinger, P. (2017). Social Support Networks and HIV/STI Risk Behaviors Among Latino Immigrants in a New Receiving Environment. *AIDS and behavior, 21*(12), 3607-3617. doi:10.1007/s10461-017-1849-8

American Addiction Centers. (2019). The Heightened Risk of Substance Use Associated With Mental Illness. Retrieved from https://americanaddictioncenters.org/learn/risk-substance-abuse-mental-illness/

American Foundation for AIDS Research. (2008). Women and HIV: Still Burdened by Stigma. Retrieved from https://www.amfar.org/articles/on-the-hill/older/women-and-hiv--still-burdened-by-stigma/

Amin, A. (2015). Addressing gender inequalities to improve the sexual and reproductive health and wellbeing of women living with HIV. *J Int AIDS Soc, 18*(Suppl 5), 20302. doi:10.7448/IAS.18.6.20302

Andrasik, M. P., Rose, R., Pereira, D., & Antoni, M. (2008). Barriers to cervical cancer screening among low-income HIV-positive African American women. *Journal of health care for the poor and underserved, 19*(3), 912-925. doi:10.1353/hpu.0.0037

Ashford, C., Morris, M., & Powell, A. (2020). Bareback Sex in the Age of Preventative Medication: Rethinking the 'Harms' of HIV Transmission. *Journal of Criminal Law, 84*(6), 596-614. doi:10.1177/0022018320974904

Atroszko, P. A., Bagińska, P., Mokosińska, M., Sawicki, A., & Atroszko, B. (2015). Validity and reliability of single-item self-report measures of general quality of life, general health and sleep quality. Retrieved from London: https://www.researchgate.net/profile/Bartosz-Atroszko-2/publication/283726345_Validity_and_reliability_of_single-item_self-report_measures_of_general_quality_of_life_general_health_and_sleep_quality/links/56463c8a08aef646e6cda461/Validity-and-reliability-of-single-item-self-report-measures-of-general-quality-of-life-general-health-and-sleep-quality.pdf?origin=publication_detail

Attia, S., Egger, M., Mueller, M., Zwahlen, M., & Low, N. (2009). Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis. *Aids, 23*(11), 1397-1404. doi:10.1097/QAD.0b013e32832b7dca

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative research : QR, 1*(3), 385-405. doi:10.1177/146879410100100307

Avert. (2018a). HIV and AIDS in Latin America and the Caribbean regional overview. Retrieved from https://www.avert.org/professionals/hiv-around-world/latin-america/overview

Avert. (2018b). Young people, HIV and AIDS. Retrieved from https://www.avert.org/professionals/hiv-social-issues/key-affected-populations/young-people#footnote3_pf99ja9

Avert. (2019). HIV and AIDS in the United States of America (USA). Retrieved from https://www.avert.org/professionals/hiv-around-world/western-central-europe-north-america/usa

Aziz, M., & Smith, K. Y. (2011). Challenges and successes in linking HIV-infected women to care in the United States. *Clin Infect Dis, 52 Suppl 2,* S231-237. doi:10.1093/cid/ciq047

Bakanauskas, A. P., Kondrotienė, E., & Puksas, A. (2020). The Theoretical Aspects of Attitude Formation Factors and Their Impact on Health Behaviour. *Organizacijų Vadyba: Sisteminiai Tyrimai, 83*(1), 15-36. doi:10.1515/mosr-2020-0002

Baltes, M. M. (1976). Health care from a behavioral-ecological viewpoint. *Health Care Dimensions, 3,* 149-163.

Banducci, A. N., Hoffman, E. M., Lejuez, C. W., & Koenen, K. C. (2014). The impact of childhood abuse on inpatient substance users: Specific links with risky sex, aggression, and emotion dysregulation. *Child Abuse & Neglect, 38*(5), 928-938. doi:10.1016/j.chiabu.2013.12.007

Baranoski, A. S., Horsburgh, C. R., Cupples, L. A., Aschengrau, A., & Stier, E. A. (2011). Risk factors for nonadherence with Pap testing in HIV-infected women. *Journal Of Women's Health (2002), 20*(11), 1635-1643. doi:10.1089/jwh.2010.2465

Batchelder, A. W., Gonzalez, J. S., Palma, A., Schoenbaum, E., & Lounsbury, D. W. (2015). A Social Ecological Model of Syndemic Risk affecting Women with and At-Risk for HIV in Impoverished Urban Communities. *American Journal of Community Psychology, 56*(3/4), 229-240. doi:10.1007/s10464-015-9750-y

Batchelder, A. W., Lounsbury, D. W., Palma, A., Carrico, A., Pachankis, J., Schoenbaum, E., & Gonzalez, J. S. (2016). Importance of substance use and violence in psychosocial syndemics among women with and at-risk for HIV. *AIDS Care, 28*(10), 1316-1320. doi:10.1080/09540121.2016.1173637

Bauermeister, J. A., Eaton, L., Andrzejewski, J., Loveluck, J., VanHemert, W., & Pingel, E. S. (2015). Where You Live Matters: Structural Correlates of HIV Risk Behavior Among Young Men Who Have Sex with Men in Metro Detroit. *AIDS And Behavior, 19*(12), 2358-2369. doi:10.1007/s10461-015-1180-1

Bavinton, B. R., Pinto, A. N., Phanuphak, N., Grinsztejn, B., Prestage, G. P., Zablotska-Manos, I. B., . . . Opposites Attract Study, G. (2018). Viral suppression and HIV transmission in serodiscordant male couples: an international, prospective, observational, cohort study. *Lancet Hiv, 5*(8), E438-E447. doi:10.1016/s2352-3018(18)30132-2

Bavinton, B. R., & Rodger, A. J. (2020). Undetectable viral load and HIV transmission dynamics on an individual and population level: where next in the global HIV response? *Current Opinion in Infectious Diseases, 33*(1), 20-27. doi:10.1097/qco.0000000000000613

Bazzi, A. R., Yotebieng, K. A., Agot, K., Rota, G., & Syvertsen, J. L. (2018). Perspectives on biomedical HIV prevention options among women who inject drugs in Kenya. *AIDS Care, 30*(3), 343-346. doi:10.1080/09540121.2017.1363369

Beadnell, B., Baker, S. A., Gillmore, M. R., Morrison, D. M., Huang, B., & Stielstra, S. (2008). The Theory of Reasoned Action and the Role of External Factors on Heterosexual Men's Monogamy and Condom Use. *Journal of Applied Social Psychology, 38*(1), 97-134. doi:10.1111/j.1559-1816.2008.00298.x

Belsky, J. (1980). Child maltreatment: An ecological integration. *American Psychologist, 35*(4), 320-335. doi:10.1037/0003-066X.35.4.320

Bem, D. J. (1972). Self-Perception Theory 11 Development of self-perception theory was supported primarily by a grant from the National Science Foundation (GS 1452) awarded

to the author during his tenure at Carnegie-Mellon University. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 6, pp. 1-62): Academic Press.

Bennett, D. A. (2001). How can I deal with missing data in my study? *Australian and New Zealand journal of public health, 25*(5), 464-469. doi:10.1111/j.1467-842X.2001.tb00294.x

Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative research : QR, 15*(2), 219-234. doi:10.1177/1468794112468475

Betz, M. E., Gebo, K. A., Barber, E., Sklar, P., Fleishman, J. A., Reilly, E. D., & Mathews, W. C. (2005). Patterns of Diagnoses in Hospital Admissions in a Multistate Cohort of HIV-Positive Adults in 2001. *Medical Care, 43*(9), III3-III14.

Bhatt, S. J., & Douglas, N. (2020). Undetectable equals untransmittable (U = U): implications for preconception counseling for human immunodeficiency virus serodiscordant couples. *American Journal of Obstetrics and Gynecology, 222*(1), 53-53. doi:10.1016/j.ajog.2019.09.008

Biello, K. B., Bazzi, A. R., Mimiaga, M. J., Biancarelli, D. L., Edeza, A., Salhaney, P., . . . Drainoni, M. L. (2018). Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. *Harm Reduction Journal, 15*(1), 55-55. doi:10.1186/s12954-018-0263-5

Blank, M. B., Himelhoch, S. S., Balaji, A. B., Metzger, D. S., Dixon, L. B., Rose, C. E., . . . Heffelfinger, J. D. (2014). A multisite study of the prevalence of HIV with rapid testing in mental health settings. *Am J Public Health, 104*(12), 2377-2384. doi:10.2105/AJPH.2013.301633

Bonomi, A. E., Patrick, D. L., Bushnell, D. M., & Martin, M. (2000). Validation of the United States' version of the World Health Organization Quality of Life (WHOQOL) instrument. *J Clin Epidemiol, 53*(1), 1-12. doi:10.1016/s0895-4356(99)00123-7

Bradbury-Jones, C. (2007). Enhancing rigour in qualitative health research: exploring subjectivity through Peshkin's I's. *Journal of advanced nursing, 59*(3), 290-298. doi:10.1111/j.1365-2648.2007.04306.x

Bradley, H., Mattson, C. L., Beer, L., Huang, P., Shouse, R. L., & for the Medical Monitoring, P. (2016). Increased antiretroviral therapy prescription and HIV viral suppression among persons receiving clinical care for HIV infection. *AIDS, 30*(13).

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2012). Thematic analysis. In *APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological.* (pp. 57-71). Washington, DC: American Psychological Association.

Breckler, S. J. (1984). Empirical validation of affect, behavior, and cognition as distinct components of attitude. *Journal of Personality and Social Psychology, 47*(6), 1191-1205. doi:10.1037/0022-3514.47.6.1191

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513-531. doi:10.1037/0003-066X.32.7.513

Brown, E. J., & Jemmott, L. S. (2000). HIV among people with mental illness: contributing factors, prevention needs, barriers, and strategies. *Journal of psychosocial nursing and mental health services, 38*(4), 14-19.

Brown, S., Jun, M. K., Min, M. O., & Tracy, E. M. (2013). Impact of Dual Disorders, Trauma, and Social Support on Quality of Life Among Women in Treatment for Substance Dependence. *Journal of dual diagnosis, 9*(1), 61-71.

Brunette, M. F., Rosenberg, S. D., Goodman, L. A., Mueser, K. T., Osher, F. C., Vidaver, R., . . . Drake, R. E. (1999). HIV risk factors among people with severe mental illness in urban and rural areas. *Psychiatric services (Washington, D.C.), 50*(4), 556-558.

Budhwani, H., Hearld, K. R., & Chavez-Yenter, D. (2015). Depression in Racial and Ethnic Minorities: the Impact of Nativity and Discrimination. *JOURNAL OF RACIAL AND ETHNIC HEALTH DISPARITIES, 2*(1), 34-42. doi:10.1007/s40615-014-0045-z

Carneiro, P. B., Westmoreland, D. A., Patel, V. V., & Grov, C. Awareness and Acceptability of Undetectable = Untransmittable Among a US National Sample of HIV-Negative Sexual and Gender Minorities. *Aids and Behavior*, 11. doi:10.1007/s10461-020-02990-3

Cavanaugh, C. E., Hansen, N. B., & Sullivan, T. P. (2010). HIV sexual risk behavior among low-income women experiencing intimate partner violence: the role of posttraumatic stress disorder. *AIDS Behav, 14*(2), 318-327. doi:10.1007/s10461-009-9623-1

Centers for Disease Control. (2019). *HIV among Latinos*. Retrieved from https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/cdc-hiv-latinos-508.pdf

Centers for Disease Control and Prevention. (2016a). *CDC Fact Sheet: HIV Among African Americans*. Retrieved from https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/cdc-hiv-aa-508.pdf

Centers for Disease Control and Prevention. (2016b). Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV—United States, 2016. *Annals of Emergency Medicine, 68*(3), 335-338.

Centers for Disease Control and Prevention. (2019a). CDC Data Confirm: Progress in HIV Prevention has Stalled. Retrieved from https://www.cdc.gov/media/releases/2019/0227-hiv-prevention-stalled.html

Centers for Disease Control and Prevention. (2019b). *Estimated HIV incidence and prevalence in the United States, 2010–2016. HIV Surveillance Supplemental Report* Retrieved from Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services: https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf

Centers for Disease Control and Prevention. (2019c). *Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data: United States and 6 Dependent Areas, 2017*. Retrieved from https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-3.pdf

Centers for Disease Control and Prevention. (2020). HIV and Hispanics/Latinos. Retrieved from https://www.cdc.gov/hiv/group/racialethnic/hispaniclatinos/index.html

Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. (2020a). HIV and African Americans. Retrieved from https://www.cdc.gov/hiv/group/racialethnic/africanamericans/index.html

Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. (2020b). HIV and women. Retrieved from https://www.cdc.gov/hiv/group/gender/women/index.html

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention. (2021). *HIV and Women*. Retrieved from https://www.cdc.gov/hiv/pdf/group/gender/women/cdc-hiv-women.pdf

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. (2018). *Selected National HIV Prevention and Care Outcomes*. Retrieved from https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-prevention-and-care-outcomes-2018.pdf

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. (2019). HIV Incidence: Estimated Annual Infections in the U.S., 2010-2016. Retrieved from https://www.cdc.gov/nchhstp/newsroom/2019/HIV-incidence.html

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Division of HIV/AIDS Prevention. (2018). *HIV Surveillance in Women 2018 (preliminary)*. Retrieved from https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-surveillance-women-2018.pdf

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of HIV/AIDS Prevention. (2019). *HIV Surveillance Report: Diagnoses of HIV Infection in the United States and Dependent Areas, 2018 (Preliminary)*. Retrieved from https://www.cdc.gov/hiv/statistics/overview/index.html

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of HIV/AIDS Prevention. (2020). HIV in the United States and dependent areas. Retrieved from https://www.cdc.gov/hiv/statistics/overview/ataglance.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhiv%2Fstatistics%2Fbasics%2Fataglance.html

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of HIV?AIDS Prevention. (n.d.). *HIV Mortality, 2017*. Retrieved from https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-surveillance-mortality-2017.pdf

Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB PreventionDivision of HIV/AIDS Prevention. (2020). *HIV Mortality, 2018*. Retrieved from https://www.cdc.gov/hiv/library/slidesets/index.html

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. (2019). Preventing intimate partner violence. Retrieved from https://www.cdc.gov/violenceprevention/intimatepartnerviolence/fastfact.html

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. (2021). The Social-Ecological Model: A Framework for Prevention. Retrieved from https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html

Cianelli, R., Villegas, N., Gonzalez-Guarda, R., Kaelber, L., & Peragallo, N. (2010). HIV Susceptibility Among Hispanic Women in South Florida. *Journal of Community Health Nursing, 27*(4), 207-215. doi:10.1080/07370016.2010.515458

Clarke, V., & Braun, V. (2017). Thematic analysis. *The journal of positive psychology*, *12*(3), 297-298. doi:10.1080/17439760.2016.1262613

Cohen, J., Pepperrell, T., & Venter, W. D. F. (2020). The same lesson over and over: drugs alone will not get us to 90--90--90. *Aids, 34*(6), 943-946. doi:10.1097/qad.0000000000002494

Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., . . . Team, H. S. (2016). Antiretroviral Therapy for the Prevention of HIV-1 Transmission. *New England Journal of Medicine, 375*(9), 830-839. doi:10.1056/NEJMoa1600693

Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., . . . Team, H. S. (2011). Prevention of HIV-1 Infection with Early Antiretroviral Therapy. *New England Journal of Medicine, 365*(6), 493-505. doi:10.1056/NEJMoa1105243

Costa, E. C. V., Silva, J., & Pereira, M. G. (2017). Demographic factors, mental health problems, and psychosocial resources influence women's AIDS risk. *Health care for women international, 38*(9), 913-926. doi:10.1080/07399332.2017.1337772

Cottler, L. B., Helzer, J. E., & Tipp, J. E. (1990). Lifetime patterns of substance use among general population subjects engaging in high risk sexual behaviors: Implications for HIV risk. *The American Journal of Drug and Alcohol Abuse, 16*(3-4), 207-222. doi:10.3109/00952999009001584

Couffignal, C., Papot, E., Etienne, A., Legac, S., Laouénan, C., Beres, D., . . . Bouvet, E. (2020). Treatment as prevention (TasP) and perceived sexual changes in behavior among HIV-positive persons: a French survey in infectious diseases departments in Paris. *AIDS Care, 32*(7), 811-817. doi:10.1080/09540121.2019.1653438

Creswell, J., & Poth, C. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage Publications.

Creswell, J. W. (2014). *Research design : qualitative, quantitative, and mixed methods approaches* (4th ed. ed.): SAGE Publications.

Creswell, J. W., & Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *Theory into practice, 39*(3), 124-130. doi:10.1207/s15430421tip3903_2

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, Calif: SAGE Publications.

Cummings, K. M., Jette, A. M., & Rosenstock, I. M. (1978). Construct validation of the health belief model. *Health education monographs, 6*(4), 394-405.

D'Alonzo, K. T. (2010). Getting started in CBPR: lessons in building community partnerships for new researchers. *Nursing Inquiry*, 282.

Dahlgren, G., & Whitehead, M. (1991). *Policies and strategies to promote social equity in health. Background document to WHO-Strategy paper for Europe*. Retrieved from https://core.ac.uk/download/pdf/6472456.pdf

Darke, S., Hall, W., Heather, N., Ward, J., & Wodak, A. (1991). The reliability and validity of a scale to measure HIV risk-taking behaviour among intravenous drug users. *AIDS (London, England), 5*(2), 181-185.

Davidhizar, R. (1983). Critique of the health-belief model. *Journal of advanced nursing, 8*(6), 467-472.

de Vincenzi, I. (1994). A longitudinal study of Human Immunodeficiency Virus transmission by heterosexual partners. European Study Group on Heterosexual Transmission of HIV. *The New England journal of medicine, 331*(6), 341-346.

Denning, P., & DiNenno, E. (2019). Communities in Crisis: Is There a Generalized HIV Epidemic in Impoverished Urban Areas of the United States? Retrieved from https://www.cdc.gov/hiv/group/poverty.html

Department of State Health Services, HIV/STD Epidemiology and Surveillance Branch. (2019). *Texas HIV Surveillance Report: 2018 Annual Report*. Retrieved from file:///C:/Users/BIRDY/Downloads/HIVSurveillanceReport.pdf

Dictionary.com. (Ed.) (2021) Dictionary.com Unabridged (Vols. 2021). Random House, Inc.

Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. (2019). *HIV Surveillance Report: Diagnoses of HIV Infection in the United States and Dependent Areas, 2018 (Preliminary)*. Retrieved from https://www.cdc.gov/hiv/statistics/overview/index.html

Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. (2020a). HIV and Hispanics/Latinos. Retrieved from https://www.cdc.gov/hiv/group/racialethnic/hispaniclatinos/index.html

Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. (2020b). HIV in the United States and dependent areas. Retrieved from https://www.cdc.gov/hiv/statistics/overview/ataglance.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhiv%2Fstatistics%2Fbasics%2Fataglance.html

Dong, Y., & Peng, C.-Y. J. (2013). Principled missing data methods for researchers. *SpringerPlus, 2*(1), 222-222. doi:10.1186/2193-1801-2-222

Draksler, K. (2020). El Paso's emergency shelter reporting more domestic abuse victims. Retrieved from https://www.ktsm.com/local/el-paso-news/el-pasos-emergency-shelter-reporting-more-domestic-abuse-victims/

Draughon, J., Lucea, M., Campbell, J., Paterno, M., Bertrand, D., Sharps, P., . . . Stockman, J. (2015). Impact of Intimate Partner Forced Sex on HIV Risk Factors in Physically Abused African American and African Caribbean Women. *Journal of Immigrant & Minority Health, 17*(5), 1313.

Duran, B., Wallerstein, N., Avila, M. M., Belone, L., Minkler, M., & Foley, K. (2013). Developing and maintaining partnerships with communities. In B. A. Israel, E. Eng, A. J. Schulz, & E. A. Parker (Eds.), *Methods for Community-Based Participatory Research for Health* (pp. 85-107).

Dyson, Y. D., Mobley, Y., Harris, G., & Randolph, S. D. (2018). Using the Social-Ecological Model of HIV Prevention to Explore HIV Testing Behaviors of Young Black College Women. *JANAC: Journal of the Association of Nurses in AIDS Care, 29*(1), 53-59. doi:10.1016/j.jana.2017.11.003

Eakle, R., Bourne, A., Jarrett, C., Stadler, J., & Larson, H. (2017). Motivations and barriers to uptake and use of female-initiated, biomedical HIV prevention products in sub-Saharan Africa: an adapted meta-ethnography. *BMC public health, 17*(1), 968. doi:10.1186/s12889-017-4959-3

Editorial Staff. (2019). El Paso, Texas Drug Treatment Centers and Alcohol Rehab Information. Retrieved from https://deserthopetreatment.com/addiction-guide/west-texas-treatment-guide/el-paso/

Edwards, L. V., Lindong, I., Brown, L., Hawkins, A. S., Dennis, S., Fajobi, O., . . . Sydnor, K. D. (2017). None of Us Will Get Out of Here Alive: The Intersection of Perceived Risk for HIV, Risk Behaviors and Survival Expectations among African American Emerging Adults. *Journal of Health Care for the Poor & Underserved, 28*, 48-68. doi:10.1353/hpu.2017.0052

Eisinger, R. W., Dieffenbach, C. W., & Fauci, A. S. (2019). HIV Viral Load and Transmissibility of HIV Infection Undetectable Equals Untransmittable. *Jama-Journal of the American Medical Association, 321*(5), 451-452. doi:10.1001/jama.2018.21167

El-Bassel, N., Gilbert, L., Vinocur, D., Chang, M., & Wu, E. (2011). Posttraumatic stress disorder and HIV risk among poor, inner-city women receiving care in an emergency department. *American journal of public health, 101*(1), 120-127. doi:10.2105/AJPH.2009.181842

Eng, E., Strazza, K., Rhodes, S. D., Griffith, D., Shirah, K., & Mebane, E. (2013). Insiders and Outsiders Assess Who is "The Community": Participant Observation, Key Informant Interview, Focus Group Interview, and Community Forum. In B. A. Israel, E. Eng, A. J. Schulz, & E. A. Parker (Eds.), *Methods for Community-Based Participatory Research for Health* (2 ed., pp. 160-184).

Enriquez, M., Kelly, P. J., Witt, J., Rodriguez, L., Lopez, N., Smueles, J., . . . Sweet, D. (2010). Silence Is Not Golden: Invisible Latinas Living with HIV in the Midwest. *Journal of Immigrant and Minority Health, 12*(6), 932.

Ettner, S. L., Conover, C. J., Proescholdbell, R. J., Weaver, M. R., Ang, A., Arno, P. S., & HIV/AIDS Treatment Adherence, H. a. O. a. C. S. G. (2008). Triply-diagnosed patients

in the HIV/AIDS Treatment Adherence, Health Outcomes and Cost Study: patterns of home care use. *AIDS Care, 20*(10), 1177-1189. doi:10.1080/09540120801918644

Evans, M. E., Tao, G., Porter, S. E., Gray, S. C., Huang, Y. A., & Hoover, K. W. (2018). Low HIV testing rates among US women who report anal sex and other HIV sexual risk behaviors, 2011-2015. *Am J Obstet Gynecol, 219*(4), 383.e381-383.e387. doi:10.1016/j.ajog.2018.08.026

Fang, L., Chuang, D.-M., & Al-Raes, M. (2019). Social support, mental health needs, and HIV risk behaviors: a gender-specific, correlation study. *BMC public health, 19*(1), 651. doi:10.1186/s12889-019-6985-9

Ferguson, C. J. (2016). An effect size primer: A guide for clinicians and researchers. In *Methodological issues and strategies in clinical research., 4th ed.* (pp. 301-310). Washington, DC: American Psychological Association.

Fischl, M. A., Richman, D. D., Grieco, M. H., Gottlieb, M. S., Volberding, P. A., Laskin, O. L., . . . King, D. (1987). The efficacy of Azidothymidine (azt) in the treatment of patients with AIDS and AIDS-related complex - a double-blind, placebo-controlled trial. *New England Journal of Medicine, 317*(4), 185-191. doi:10.1056/nejm198707233170401

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior : an introduction to theory and research*: Addison-Wesley Pub. Co.

Flaskerud, J. H., & Calvillo, E. R. (1991). Beliefs about AIDS, health, and illness among low-income Latina women. *Research in Nursing & Health, 14*(6), 431-438. doi:10.1002/nur.4770140607

Fletcher, F., Annang Ingram, L., Kerr, J., Buchberg, M., Bogdan-Lovis, L., & Philpott-Jones, S. (2016). "She Told Them, Oh That Bitch Got AIDS": Experiences of Multilevel

HIV/AIDS-Related Stigma Among African American Women Living with HIV/AIDS in the South. *AIDS Patient Care & STDs, 30*(7), 349-356. doi:10.1089/apc.2016.0026

Frew, P. M., Parker, K., Vo, L., Haley, D., O'Leary, A., Diallo, D. D., . . . Hodder, S. (2016). Socioecological factors influencing women's HIV risk in the United States: qualitative findings from the women's HIV SeroIncidence study (HPTN 064). *BMC Public Health, 16*(1). doi:10.1186/s12889-016-3364-7

Garcia, J., Parker, R. G., Parker, C., Wilson, P. A., Philbin, M., & Hirsch, J. S. (2016). The limitations of 'Black MSM' as a category: Why gender, sexuality, and desire still matter for social and biomedical HIV prevention methods. *Global Public Health, 11*(7/8), 1026-1048. doi:10.1080/17441692.2015.1134616

Gay & Lesbian Alliance Against Defamation, Gilead., & Compass Intitiative. (2020). *State of HIV stigma study*. Retrieved from https://www.glaad.org/sites/default/files/HIV-StigmaStudy_2020.pdf

Genberg, B. L., Kawichai, S., Chingono, A., Sendah, M., Chariyalertsak, S., Konda, K. A., & Celentano, D. D. (2008). Assessing HIV/AIDS stigma and discrimination in developing countries. *AIDS and behavior, 12*(5), 772-780. doi:10.1007/s10461-007-9340-6

Geter, A., Sutton, M. Y., Armon, C., & Buchacz, K. (2019). Disparities in Viral Suppression and Medication Adherence among Women in the USA, 2011-2016. *AIDS and behavior, 23*(11), 3015-3023. doi:10.1007/s10461-019-02494-9

Geter, A., Sutton, M. Y., Armon, C., Durham, M. D., Palella, F. J., Jr., Tedaldi, E., . . . Buchacz, K. (2018). Trends of racial and ethnic disparities in virologic suppression among women in the HIV Outpatient Study, USA, 2010-2015. *PloS one, 13*(1), e0189973. doi:10.1371/journal.pone.0189973

Geter, A., Sutton, M. Y., & Hubbard McCree, D. (2018). Social and structural determinants of HIV treatment and care among black women living with HIV infection: a systematic review: 2005-2016. *AIDS care, 30*(4), 409-416. doi:10.1080/09540121.2018.1426827

Geter Fugerson, A., Sutton, M. Y., & Hubbard McCree, D. (2019). Social and Structural Determinants of HIV Treatment and Care Among Hispanic Women and Latinas Living with HIV Infection in the United States: A Qualitative Review: 2008-2018. *Health Equity, 3*(1), 581-587. doi:10.1089/heq.2019.0039

Gielen, A. C., McDonnell, K. A., Wu, A. W., O'Campo, P., & Faden, R. (2001). Quality of life among women living with HIV: the importance violence, social support, and self care behaviors. *Social science & medicine (1982), 52*(2), 315-322.

Golden, S. D., & Earp, J. A. (2012). Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Educ Behav, 39*(3), 364-372. doi:10.1177/1090198111418634

Golding, J. M. Intimate Partner Violence as a Risk Factor for Mental Disorders: A Meta-Analysis.

Golding, J. M. (1999). Intimate Partner Violence as a Risk Factor for Mental Disorders: A Meta-Analysis. *Journal of Family Violence, 14*(2), 99-132. doi:10.1023/A:1022079418229

Gonzalez-Guarda, R. M., McCabe, B. E., Florom-Smith, A., Cianelli, R., & Peragallo, N. (2011). Substance abuse, violence, HIV, and depression: an underlying syndemic factor among Latinas, *60(3),* 182. Retrieved from http://0-search.ebscohost.com.lib.utep.edu/login.aspx?direct=true&db=edsgih&AN=edsgcl.259631479&site=eds-live&scope=site

Gonzalez-Guarda, R. M., McCabe, B. E., Mathurin, E., DeBastiani, S. D., & Peragallo Montano, N. (2017). The Influence of Relationship Power and Partner Communication on the Syndemic Factor among Hispanic Women. *Women's health issues : official publication of the Jacobs Institute of Women's Health, 27*(4), 478-484. doi:10.1016/j.whi.2017.02.005

Gonzalez-Guarda, R. M., Vasquez, E. P., Urrutia, M. T., Villarruel, A. M., & Peragallo, N. (2011). Hispanic women's experiences with substance abuse, intimate partner violence, and risk for HIV. *Journal of transcultural nursing : official journal of the Transcultural Nursing Society, 22*(1), 46-54. doi:10.1177/1043659610387079

González-Guarda, R. M., Florom-Smith, A. L., & Thomas, T. (2011). A syndemic model of substance abuse, intimate partner violence, HIV infection, and mental health among Hispanics. *Public health nursing (Boston, Mass.), 28*(4), 366-378. doi:10.1111/j.1525-1446.2010.00928.x

González-Guarda, R. M., McCabe, B. E., Leblanc, N., De Santis, J. P., & Provencio-Vasquez, E. (2016). The contribution of stress, cultural factors, and sexual identity on the substance abuse, violence, HIV, and depression syndemic among Hispanic men. *Cultural Diversity and Ethnic Minority Psychology, 22*(4), 563-571. doi:10.1037/cdp0000077

Gornick, M. E., & Swift, E. K. (2002). Disparities in health care: Methods for studying the effects of race, ethnicity, and SES on access, use, and quality of health care. *Institute of Medicine. Washington, DC: United States Department of Health and Human Services (USDHHS). Retrieved August, 30,* 2013.

Gosbell, I. B., Hoad, V. C., Styles, C. E., Lee, J., & Seed, C. R. (2019). Undetectable does not equal untransmittable for HIV and blood transfusion. *Vox Sanguinis*(6), 628. doi:10.1111/vox.12790

Graham, N. M. H., Zeger, S. L., Park, L. P., Vermund, S. H., Detels, R., Rinaldo, C. R., & Phair, J. P. (1992). The effects on survival of early treatment of Human-Immunodeficiency-Virus infection. *New England Journal of Medicine, 326*(16), 1037-1042. doi:10.1056/nejm199204163261601

Grinsztejn, B., Hosseinipour, M. C., Ribaudo, H. J., Swindells, S., Eron, J., Chen, Y. Q., . . . Team, H.-A. S. (2014). Effects of early versus delayed initiation of antiretroviral treatment on clinical outcomes of HIV-1 infection: results from the phase 3 HPTN 052 randomised controlled trial. *Lancet Infect Dis, 14*(4), 281-290. doi:10.1016/S1473-3099(13)70692-3

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Newbury Park, Calif: Sage Publications.

Guerrero, D. (2017). More leading health experts and organizations endorse undetectable = untransmittable: when is there zero risk of transmitting HIV? *Advocate*(1093), 33-33.

Gómez-Melasio, D. A. (2021). *Modelo de Conducta Sexual Más Segura en Adultos de Mediana y Tercera Edad.* (Doctor en Ciencias de Enfermería). Universidad Autónoma de Nuevo León, Retrieved from http://eprints.uanl.mx/22153/

Hamilton, J. D., Hartigan, P. M., Simberkoff, M. S., Day, P. L., Diamond, G. R., Dickinson, G. M., . . . Zollapazner, S. B. (1992). A controlled trial of early versus late treatment with Zidovudine in symptomatic Human-Immunodeficiency-Virus infection - results of the Veterans Affairs Cooperative study. *New England Journal of Medicine, 326*(7), 437-443. doi:10.1056/nejm199202133260703

Hargreaves, J. R., Krishnaratne, S., Mathema, H., Lilleston, P. S., Sievwright, K., Mandla, N., . . . Team, H. P. S. (2018). Individual and community-level risk factors for HIV stigma in

21 Zambian and South African communities: analysis of data from the HPTN071 (PopART) study. *AIDS, 32*(6), 783-793. doi:10.1097/QAD.0000000000001757

Harrison, J. A., Mullen, P. D., & Green, L. W. (1992). A meta-analysis of studies of the Health Belief Model with adults. *Health Educ Res, 7*(1), 107-116. doi:10.1093/her/7.1.107

Health Management Associates. (2020). *El Paso County Behavioral Health Study Findings and Priorities* Retrieved from https://assets-communityservices.elpasoco.com/wp-content/uploads/JusticeServices/CriminalJusticeCoordinatingCouncil/CJCC-Behavioral-Health-Gaps-and-Needs-Analysis-of-the-Pikes-Peak-Region-2020-2021.pdf

Heron, S. L., Thompson, M. P., Jackson, E., & Kaslow, N. J. (2003). Do responses to an intimate partner violence screen predict scores on a comprehensive measure of intimate partner violence in low-income black women? *Annals of Emergency Medicine, 42*(4), 483-491. doi:10.1067/S0196-0644(03)00718-2

Heumann, C. L. (2018). Biomedical Approaches to HIV Prevention in Women. *Current infectious disease reports, 20*(6), 11. doi:10.1007/s11908-018-0618-9

Hirschhorn, L. R., McInnes, K., Landon, B. E., Wilson, I. B., Ding, L., Marsden, P. V., . . . Cleary, P. D. (2006). Gender differences in quality of HIV care in Ryan White CARE Act-funded clinics. *Women's Health Issues, 16*(3), 104-112. doi:10.1016/j.whi.2006.02.004

HIV.gov. (2020). HIV Basics. Overview: Data & Trends: U.S. Statistics. Retrieved from https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics

Holt, M., Lea, T., Murphy, D. A., Ellard, J., Rosengarten, M., Kippax, S. C., & De Wit, J. B. F. (2014). Australian Gay and Bisexual Men's Attitudes to HIV Treatment as Prevention in

Repeated, National Surveys, 2011-2013. *PLoS ONE, 9*(11), 1-9. doi:10.1371/journal.pone.0112349

Huang, Y. A., Zhu, W., Smith, D. K., Harris, N., & Hoover, K. W. (2018). *HIV Preexposure Prophylaxis, by Race and Ethnicity — United States, 2014–2016. MMWR Morb Mortal Wkly Rep*. Retrieved from https://www.cdc.gov/mmwr/volumes/67/wr/mm6741a3.htm

Hull, M. W., & Montaner, J. S. G. (2013). HIV treatment as prevention: the key to an AIDS-free generation. *Journal of food and drug analysis, 21*(4), S95-S101. doi:10.1016/j.jfda.2013.09.043

IBM Corp. (2019). IBM SPSS Statistics for Windows, version 26.0. In. Armonk, NY.

Ingoldsby, B. B. (1991). The Latin American Family: Familism vs. Machismo. *Journal of Comparative Family Studies, 22*(1), 57-62. doi:10.3138/jcfs.22.1.57

Jakobsen, J. C., Gluud, C., Wetterslev, J., & Winkel, P. (2017). When and how should multiple imputation be used for handling missing data in randomised clinical trials - a practical guide with flowcharts. *BMC Med Res Methodol, 17*(1), 162. doi:10.1186/s12874-017-0442-1

Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: a decade later. *Health Educ Q, 11*(1), 1-47. doi:10.1177/109019818401100101

Joint United Nations Programme on HIV/ Acquired Immune Deficiency Syndrome. (2019). *UNAIDS Data 2019*. Retrieved from https://www.unaids.org/sites/default/files/media_asset/2019-UNAIDS-data_en.pdf

Joint United Nations Programme on HIV/AIDS. (2014). *90-90-90: An ambitious treatment target to help end the AIDS epidemic*. Retrieved from https://www.unaids.org/sites/default/files/media_asset/90-90-90_en.pdf

Joint United Nations Programme on HIV/AIDS. (2015). *AIDS by the Numbers 2015*. Retrieved from https://www.unaids.org/sites/default/files/media_asset/AIDS_by_the_numbers_2015_en.pdf

Joint United Nations Programme on HIV/AIDS. (2018). HIV and AIDS estimate country factsheets: Belize 2018. Retrieved from https://www.unaids.org/en/regionscountries/countries/belize

Joint United Nations Programme on HIV/AIDS. (2020a). *Global AIDS Update 2020: Seizing the Moment*. Retrieved from https://www.unaids.org/sites/default/files/media_asset/2020_global-aids-report_en.pdf

Joint United Nations Programme on HIV/AIDS. (2020b). Global HIV & AIDS statistics- 2020 fact sheet. Retrieved from https://www.unaids.org/en/resources/fact-sheet#:~:text=25.4%20million%20%5B24.5%20million%E2%80%9325.6,infected%20with%20HIV%20in%202019.

Josephs, L., & Abel, E. (2009). Investigating the Relationship Between Intimate Partner Violence and HIV Risk-Propensity in Black/African-American Women. *Journal of Family Violence, 24*(4), 221-229. doi:10.1007/s10896-009-9223-x

Kaiser Family Foundation. (2020a). Black Americans and HIV/AIDS: The Basics. Retrieved from https://www.kff.org/hivaids/fact-sheet/black-americans-and-hivaids-the-basics/

Kaiser Family Foundation. (2020b). The Global HIV/AIDS Epidemic. Retrieved from https://www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/

Kaiser Family Foundation. (2020c). Women and HIV in the United States. Retrieved from https://www.kff.org/hivaids/fact-sheet/women-and-hivaids-in-the-united-states/#footnote-452735-10

Kaiser Fammily Foundation. (2014). Latinos and HIV/AIDS. Retrieved from https://www.kff.org/hivaids/fact-sheet/latinos-and-hivaids/

Kalichman, S. C., Cherry, C., Kalichman, M. O., Washington, C., Grebler, T., Hoyt, G., . . . Welles, B. (2016). Sexual behaviors and transmission risks among people living with HIV: Beliefs, perceptions, and challenges to using treatments as prevention. *Archives of Sexual Behavior, 45*(6), 1421-1430. doi:10.1007/s10508-015-0559-4

Kalichman, S. C., Cherry, C., Kalichman, M. O., Washington, C., Grebler, T., Merely, C., . . . Kegler, C. (2015). HIV sexual transmission risks in the context of clinical care: a prospective study of behavioural correlates of HIV suppression in a community sample, Atlanta, GA, USA. *Journal of the International AIDS Society*, *18*, 19930. doi:10.7448/IAS.18.1.19930

Kalichman, S. C., Eaton, L., Cain, D., Cherry, C., Fuhrel, A., Kaufman, M., & Pope, H. (2007). Changes in HIV treatment beliefs and sexual risk behaviors among gay and bisexual men, 1997-2005. *Health Psychology, 26*(5), 650-656. doi:10.1037/0278-6133.26.5.650

Kalichman, S. C., Eaton, L., Cain, D., Cherry, C., Pope, H., & Kalichman, M. (2006). HIV treatment beliefs and sexual transmission risk behaviors among HIV positive men and women. *J Behav Med, 29*(5), 401-410. doi:10.1007/s10865-006-9066-3

Kegeles, S. S. (1980). Marshall H. Becker The Health Belief Model and Personal Health Behavior 1974 Slack London. *Social Science and Medicine. Part C Medical Economics, 14*(3), 227-229. doi:10.1016/S0160-7995(80)80012-8

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical teacher, 42*(8), 846-854. doi:10.1080/0142159X.2020.1755030

Kleinsasser, A. M. (2000). Researchers, reflexivity, and good data: Writing to unlearn. *Theory into practice, 39*(3), 155-162.

Koblin, B. A., Grant, S., Frye, V., Superak, H., Sanchez, B., Lucy, D., . . . Frank, I. (2015). HIV Sexual Risk and Syndemics among Women in Three Urban Areas in the United States: Analysis from HVTN 906. *Journal of urban health : bulletin of the New York Academy of Medicine, 92*(3), 572-583. doi:10.1007/s11524-015-9944-5

Kohler, C. L., Grimley, D., & Reynolds, K. (1999). Theoretical approaches guiding the development and implementation of health promotion programs. In J. M. Raczynski & R. J. DiCelmente (Eds.), *Handbook of Health Promotion and Disease Prevention* (pp. 23-49). New York: Kluwer Academic/Plenum Publishers.

Koniak-Griffin, D., & Stein, J. A. (2006). Predictors of sexual risk behaviors among adolescent mothers in a human immunodeficiency virus prevention program. *Journal of Adolescent Health, 38*(3), 297-297. doi:10.1016/j.jadohealth.2004.12.008

Korthuis, P. T., Fiellin, D. A., McGinnis, K. A., Skanderson, M., Justice, A. C., Gordon, A. J., . . . Kraemer, K. L. (2012). Unhealthy alcohol and illicit drug use are associated with decreased quality of HIV care. *Journal of acquired immune deficiency syndromes (1999), 61*(2), 171-178. doi:10.1097/QAI.0b013e31826741aa

Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2009). An Ultra-Brief Screening Scale for Anxiety and Depression: The PHQ–4. *Psychosomatics, 50*(6), 613-621. doi:10.1016/S0033-3182(09)70864-3

Lain, M. A., Valverde, M., & Frehill, L. M. (2007). Late entry into HIV/AIDS medical care: the importance of past relationships with medical providers. *AIDS Care, 19*(2), 190-194.

Lallemant, M., Jourdain, G., Le Coeur, S., Kim, S., Koetsawang, S., Comeau, A. M., . . . Vithayasai, V. (2000). A trial of shortened zidovudine regimens to prevent mother-to-child transmission of human immunodeficiency virus type 1. Perinatal HIV Prevention Trial (Thailand) Investigators. *The New England journal of medicine, 343*(14), 982-991. doi:10.1056/NEJM200010053431401

Lambert-Niclot, S., Tubiana, R., Beaudoux, C., Lefebvre, G., Caby, F., Bonmarchand, M., . . . Marcelin, A.-G. (2012). Detection of HIV-1 RNA in seminal plasma samples from treated patients with undetectable HIV-1 RNA in blood plasma on a 2002-2011 survey. *Aids, 26*(8), 971-975. doi:10.1097/QAD.0b013e328352ae09

Larios, S. E., Lozada, R., Strathdee, S. A., Semple, S. J., Roesch, S., Staines, H., . . . Patterson, T. L. (2009). An exploration of contextual factors that influence HIV risk in female sex workers in Mexico: The Social Ecological Model applied to HIV risk behaviors. *AIDS Care, 21*(10), 1335-1342. doi:10.1080/09540120902803190

Latkin, C. A., German, D., Vlahov, D., & Galea, S. (2013). Neighborhoods and HIV: a social ecological approach to prevention and care. *The American Psychologist, 68*(4), 210-224. doi:10.1037/a0032704

Lee, K., Hutton, H. E., Lesko, C. R., Monroe, A. K., Alvanzo, A., McCaul, M. E., & Chander, G. (2018). Associations of Drug Use, Violence, and Depressive Symptoms with Sexual Risk Behaviors Among Women with Alcohol Misuse. *WOMENS HEALTH ISSUES, 28*(4), 367-374. doi:10.1016/j.whi.2018.04.004

Li, L., Wu, Z., Wu, S., Zhaoc, Y., Jia, M., & Yan, Z. (2007). HIV-related stigma in health care settings: a survey of service providers in China. *AIDS patient care and STDs, 21*(10), 753-762. doi:10.1089/apc.2006.0219

Lillie-Blanton, M., Stone, V. E., Snow Jones, A., Levi, J., Golub, E. T., Cohen, M. H., . . . Wilson, T. E. (2010). Association of race, substance abuse, and health insurance coverage with use of highly active antiretroviral therapy among HIV-infected women, 2005. *American journal of public health, 100*(8), 1493-1499. doi:10.2105/AJPH.2008.158949

Lin, M., Hirschfeld, G., & Margraf, J. (2019). Brief form of the Perceived Social Support Questionnaire (F-SozU K-6): Validation, norms, and cross-cultural measurement invariance in the USA, Germany, Russia, and China. *Psychol Assess, 31*(5), 609-621. doi:10.1037/pas0000686

Little, R., J. A. (1988). A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association, 83*(404), 1198-1202. doi:10.2307/2290157

Long, E. F., & Stavert, R. R. (2013). Portfolios of Biomedical HIV Interventions in South Africa: A Cost-Effectiveness Analysis. *Journal of General Internal Medicine, 28*(10), 1294-1301.

Lux, K. M., & Petosa, R. (1994). Using the health belief model to predict safer sex intentions of incarcerated youth. *Health Education Quarterly, 21*(4), 487-497. doi:10.1177/109019819402100411

Löwe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., . . . Brähler, E. (2010). A 4-item measure of depression and anxiety: Validation and standardization of the

Patient Health Questionnaire-4 (PHQ-4) in the general population. *Journal of Affective Disorders, 122*(1), 86-95. doi:10.1016/j.jad.2009.06.019

Mandy, J. H., Marylou, C. T., Samuel, P., Jeffrey, W. C., & Marlene, M. (2020). Racial and sex disparities in HIV screening outcomes within emergency departments of Harris County, Texas. *Journal of the American College of Emergency Physicians Open, 1*(4), 476-483. doi:10.1002/emp2.12046

Marshall, B. D. L., Prescott, M. R., Liberzon, I., Tamburrino, M. B., Calabrese, J. R., & Galea, S. (2013). Posttraumatic stress disorder, depression, and HIV risk behavior among Ohio Army National Guard Soldiers. *Journal of traumatic stress, 26*(1), 64-70. doi:10.1002/jts.21777

McCabe, B. E., Schaefer Solle, N., Peragallo Montano, N., & Mitrani, V. B. (2017). Alcohol misuse, depressive symptoms, and HIV/STI risks of US Hispanic women. *Ethn Health, 22*(5), 528-540. doi:10.1080/13557858.2016.1244738

McFall, A. M., Dowdy, D. W., Zelaya, C. E., Murphy, K., Wilson, T. E., Young, M. A., . . . Study, W. s. I. H. (2013). Understanding the disparity: predictors of virologic failure in women using highly active antiretroviral therapy vary by race and/or ethnicity. *J Acquir Immune Defic Syndr, 64*(3), 289-298. doi:10.1097/QAI.0b013e3182a095e9

McKinnon, K., Cournos, F., Sugden, R., Guido, J. R., & Herman, R. (1996). The relative contributions of psychiatric symptoms and AIDS knowledge to HIV risk behaviors among people with severe mental illness. *The Journal of clinical psychiatry, 57*(11), 506-513.

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 15*(4), 351-377.

McNeely, J., Wu, L.-T., Subramaniam, G., Sharma, G., Cathers, L. A., Svikis, D., . . . Schwartz, R. P. (2016). Performance of the Tobacco, Alcohol, Prescription Medication, and Other Substance Use (TAPS) Tool for Substance Use Screening in Primary Care Patients. *Annals of internal medicine, 165*(10), 690-699. doi:10.7326/M16-0317

Meade, C. S., Kershaw, T. S., Hansen, N. B., & Sikkema, K. J. (2009). Long-term correlates of childhood abuse among adults with severe mental illness: adult victimization, substance abuse, and HIV sexual risk behavior. *AIDS and behavior, 13*(2), 207-216.

Meade, C. S., & Sikkema, K. J. (2005a). HIV risk behavior among adults with severe mental illness: a systematic review. *Clinical psychology review, 25*(4), 433-457.

Meade, C. S., & Sikkema, K. J. (2005b). Voluntary HIV testing among adults with severe mental illness: frequency and associated factors. *AIDS and behavior, 9*(4), 465-473.

Messer, L. C., Quinlivan, E. B., Parnell, H., Roytburd, K., Adimora, A. A., Bowditch, N., & DeSousa, N. (2013). Barriers and Facilitators to Testing, Treatment Entry, and Engagement in Care by HIV-Positive Women of Color. *AIDS Patient Care & STDs, 27*(7), 398-407. doi:10.1089/apc.2012.0435

Meyer, J. P., Springer, S. A., & Altice, F. L. (2011). Substance abuse, violence, and HIV in women: a literature review of the syndemic. *Journal of women's health (2002), 20*(7), 991-1006. doi:10.1089/jwh.2010.2328

Miller, S., Exner, T. M., Williams, S. P., & Ehrdhardt, A. A. (2000). A gender-specific intervention for at-risk women in the USA. *AIDS Care, 12*(5), 603-612. doi:10.1080/095401200750003789

Mills, S. D., Fox, R. S., Pan, T. M., Malcarne, V. L., Roesch, S. C., & Sadler, G. R. (2015). Psychometric Evaluation of the Patient Health Questionnaire-4 in Hispanic Americans.

Hispanic journal of behavioral sciences, 37(4), 560-571. doi:10.1177/0739986315608126

Minkler, M., & Wallerstein, N. (2003). *Community based participatory research for health*: Jossey-Bass.

Minnesota Department of Public Health, Community and Family Health Division, & Practice, O. o. P. H. (2010). *Evaluating the Healthy People 2020 Framework: The Minnesota Project, Social Connectedness* Retrieved from https://www.health.state.mn.us/communities/practice/resources/publications/docs/1007socialconnectedness_report.pdf

Misener, T. R., & Sowell, R. L. (1998). HIV-infected women's decisions to take antiretrovirals. *Western Journal of Nursing Research, 20*(4), 431-447. doi:10.1177/019394599802000403

Monge, C. (1978). Ecology and health. *Bulletin Of The Pan American Health Organization, 12*(1), 7-10.

Morales, L. S., Lara, M., Kington, R. S., Valdez, R. O., & Escarce, J. J. (2002). Socioeconomic, cultural, and behavioral factors affecting Hispanic health outcomes. *J Health Care Poor Underserved, 13*(4), 477-503. doi:10.1177/104920802237532

Morales-Alemán, M. M., Hageman, K., Gaul, Z. J., Le, B., Paz-Bailey, G., & Sutton, M. Y. (2014). Intimate Partner Violence and Human Immunodeficiency Virus Risk Among Black and Hispanic Women. *American Journal of Preventive Medicine, 47*(6), 689-702. doi:10.1016/j.amepre.2014.08.007

Moucheraud, C., Stern, A. F., Ahearn, C., Ismail, A., Nsubuga-Nyombi, T., Ngonyani, M. M., . . . Ssensamba, J. (2019). Barriers to HIV Treatment Adherence: A Qualitative Study of

Discrepancies Between Perceptions of Patients and Health Providers in Tanzania and Uganda. *AIDS Patient Care & STDs, 33*(9), 406-413. doi:10.1089/apc.2019.0053

Moustakas, C. E. (1994). *Phenomenological research methods*: Sage.

Mugavero, M. J., Lin, H. Y., Allison, J. J., Willig, J. H., Chang, P. W., Marler, M., . . . Saag, M. S. (2007). Failure to establish HIV care: characterizing the "no show" phenomenon. *Clin Infect Dis, 45*(1), 127-130. doi:10.1086/518587

Napper, L. E., Fisher, D. G., & Reynolds, G. L. (2012). Development of the Perceived Risk of HIV Scale. *AIDS and Behavior*(4), 1075.

Narvaez, J. C. d. M., Remy, L., Bermudez, M. B., Scherer, J. N., Ornell, F., Surratt, H., . . . Pechansky, F. (2019). Re-traumatization Cycle: Sexual Abuse, Post-Traumatic Stress Disorder and Sexual Risk Behaviors among Club Drug Users. *Substance use & misuse, 54*(9), 1499-1508. doi:10.1080/10826084.2019.1589521

National Alliance on Mental Illness. (2019). Mental health by the numbers. Retrieved from https://www.nami.org/Learn-More/Mental-Health-By-the-Numbers

National Institute of Mental Health. (2019). Mental health information: mental illness statistic. Retrieved from https://www.nimh.nih.gov/health/statistics/mental-illness.shtml#part_154785

National Institutes of Health, National Institute of Allergy and Infectious Diseases. (2006). *Statement of Anthony S Fauci, MD, Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health, on National Women and Girls HIV/AIDS Awareness Day*: US Department of Health and Human Services (HHS), National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases (NIAID).

Nduaguba, S. O., Ford, K. H., Wilson, J. P., & Lawson, K. A. (2018). Trends in Racial/Ethnic Disparities Among Patients Living with HIV in Texas, 1996 to 2013. *Journal of racial and ethnic health disparities, 5*(5), 1023-1032. doi:10.1007/s40615-017-0450-1

New Solutions, Inc. (2013). *PanWest-West Texas 2013 Ryan White Part B Comprehensive Needs Assessment*. Retrieved from https://panwest.org/wp-content/uploads/2017/07/PanWest-Needs-Assessment-2013.pdf

Newcomb, M. D., & Carmona, J. V. (2004). Adult trauma and HIV status among Latinas: effects upon psychological adjustment and substance use. *AIDS and behavior, 8*(4), 417-428.

Newcomb, M. E., & Rendina, H. J. (2020). Introduction to the Special Section on Social and Behavioral Science with Gay and Bisexual Men in the Era of Biomedical Prevention. *Archives of Sexual Behavior, 49*(1), 87-90. doi:10.1007/s10508-020-01639-5

Ngure, K., Ongolly, F., Dolla, A., Awour, M., Mugwanya, K. K., Irungu, E., . . . Team, P. S.-U. P. (2020). "I just believe there is a risk" understanding of undetectable equals untransmissible (U = U) among health providers and HIV-negative partners in serodiscordant relationships in Kenya. *J Int AIDS Soc, 23*(3), e25466. doi:10.1002/jia2.25466

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods, 16*(1), 1-13. doi:10.1177/1609406917733847

Nwangwu-Ike, N., Frazier, E. L., Crepaz, N., Tie, Y., & Sutton, M. Y. (2018). Racial and Ethnic Differences in Viral Suppression Among HIV-Positive Women in Care. *Journal of acquired immune deficiency syndromes (1999), 79*(2), e56-e68. doi:10.1097/QAI.0000000000001779

Nwangwu-Ike, N., Hernandez, A. L., An, Q., Huang, T., & Hall, H. I. (2015). The Epidemiology of Human Immunodeficiency Virus Infection and Care among Adult and Adolescent Females in the United States, 2008–2012. *Women's Health Issues, 25*(6), 711-719. doi:10.1016/j.whi.2015.07.004

Office of Disease Prevention and Health Promotion. (2020). Healthy People 2020: Disparities. Retrieved from https://www.healthypeople.gov/2020/about/foundation-health-measures/Disparities

Okoli, C., Van de Velde, N., Richman, B., Allan, B., Castellanos, E., Young, B., . . . de Los Rios, P. (2020). Undetectable equals untransmittable (U = U): awareness and associations with health outcomes among people living with HIV in 25 countries. *Sexually transmitted infections*. doi:10.1136/sextrans-2020-054551

Okwundu, C. I. (2012). Antiretroviral pre-exposure prophylaxis (PrEP) for preventing HIV in high-risk individuals. *Cochrane Database of Systematic Reviews*(12).

Ovalle-Valdez, I. (n.d.-a). *2016 HIV Surveillance Data*. Retrieved from https://www.elpasotexas.gov/assets/Documents/CoEP/Public-Health/Services/HIV-Prevention/2016-HIV-Surveillance-Data3.pdf

Ovalle-Valdez, I. (n.d.-b). *2017 HIV Surveillance Data*. Retrieved from https://www.elpasotexas.gov/assets/Documents/CoEP/Public-Health/Services/HIV-Prevention/2017-HIV-Surveillance-Data.pdf

Oxford University Press. (2021). Oxford Learner's Dictionary. Retrieved from https://www.oxfordlearnersdictionaries.com/us/definition/american_english/attitude#:~:text=1%5Bcountable%5D%20attitude%20(to,a%20good%2Fbad%2Fpositive%2F

Painter, T. M. (2018). Social Support Networks: An Underutilized Resource for the Prevention of HIV and other Sexually Transmitted Diseases among Hispanic/Latino Migrants and Immigrants. *Journal of health care for the poor and underserved, 29*(1), 44-57. doi:10.1353/hpu.2018.0005

Pan Caribbean Partnership Against HIV/AIDS. (2017). HIV and AIDS in the Caribbean. Retrieved from https://pancap.org/pancap-documents/hiv-and-aids-in-the-caribbean-2/

PanWest-West Texas Ryan White Programs. (2013). *Comprehensive HIV Health Services Plan: 2010 - 2013*. Retrieved from https://panwest.org/wp-content/uploads/2017/07/PanWest-Comprehensive-Plan-2010-2013-Part-1.pdf

Patel, R. C., Odoyo, J., Anand, K., Stanford-Moore, G., Wakhungu, I., Bukusi, E. A., . . . Brown, J. M. (2016). Facilitators and Barriers of Antiretroviral Therapy Initiation among HIV Discordant Couples in Kenya: Qualitative Insights from a Pre-Exposure Prophylaxis Implementation Study. *PLoS One, 11*(12), e0168057. doi:10.1371/journal.pone.0168057

Patel, R. R., Curoe, K. A., & Chan, P. A. (2020). Undetectable Equals Untransmittable: A Game Changer for HIV Prevention. *Clinical chemistry, 66*(3), 406-407. doi:10.1093/clinchem/hvz010

Pearson, C. R., Kaysen, D., Belcourt, A., Stappenbeck, C. A., Zhou, C., Smartlowit-Briggs, L., & Whitefoot, P. (2015). Post-traumatic stress disorder and HIV risk behaviors among rural American Indian/Alaska Native women. *American Indian and Alaska native mental health research (Online), 22*(3), 1-20. doi:10.5820/aian.2203.2015.1

Pellowski, J. A., Kalichman, S. C., Matthews, K. A., & Adler, N. (2013). A pandemic of the poor: social disadvantage and the U.S. HIV epidemic. *Am Psychol, 68*(4), 197-209. doi:10.1037/a0032694

Peltzer, K., & Oladimeji, Y. (2004). Some factors in condom use amongst first-year Nigerian University students and black and white South Africans. *Psychol Rep, 94*(2), 583-586. doi:10.2466/pr0.94.2.583-586

Peshkin, A. (1988). In Search of Subjectivity—One's Own. *Educational researcher, 17*(7), 17-21. doi:10.3102/0013189X017007017

Pitpitan, E. V., Kalichman, S. C., Eaton, L. A., Cain, D., Sikkema, K. J., Watt, M. H., . . . Pieterse, D. (2013). Co-occurring Psychosocial Problems and HIV Risk Among Women Attending Drinking Venues in a South African Township: A Syndemic Approach. *Annals of Behavioral Medicine, 45*(2), 153-162.

Prati, G., Zani, B., Pietrantoni, L., Scudiero, D., Perone, P., Cosmaro, L., . . . Oldrini, M. (2016). The role of knowing someone living with HIV/AIDS and HIV disclosure in the HIV stigma framework: a Bayesian mediation analysis. *Quality & Quantity, 50*(2), 637-651. doi:10.1007/s11135-015-0168-2

Prince, J. D., Walkup, J., Akincigil, A., Amin, S., & Crystal, S. (2012). Serious mental illness and risk of new HIV/AIDS diagnoses: an analysis of Medicaid beneficiaries in eight states. *Psychiatr Serv, 63*(10), 1032-1038. doi:10.1176/appi.ps.201100342

Prosser, A. T., Tang, T., & Hall, H. I. (2012). HIV in persons born outside the United States, 2007-2010. *JAMA, 308*(6), 601-607. doi:10.1001/jama.2012.9046

Quinn, T. C., Wawer, M. J., Sewankambo, N., Serwadda, D., Li, C. J., Wabwire-Mangen, F., . . . Rakai Project Study, G. (2000). Viral load and heterosexual transmission of human immunodeficiency virus type 1. *New England Journal of Medicine, 342*(13), 921-929. doi:10.1056/nejm200003303421303

Raingruber, B. (2017). Health promotion theories. In *Contemporary Health Promotion in Nursin Practice* (2 ed., pp. 53-94). Burlington, MA: Jones & Bartlett Learning.

Ramallo, J., Kidder, T., Albritton, T., Blick, G., Pachankis, J., Grandelski, V., & Kershaw, T. (2015). Exploring Social Networking Technologies as Tools for HIV Prevention for Men Who Have Sex With Men. *AIDS education and prevention : official publication of the International Society for AIDS Education, 27*(4), 298-311. doi:10.1521/aeap.2015.27.4.298

Raneri, L. G., & Wiemann, C. M. (2007). Social ecological predictors of repeat adolescent pregnancy. *Perspectives on Sexual and Reproductive Health*(1), 39.

Ransome, Y., Kawachi, I., Braunstein, S., & Nash, D. (2016). Structural inequalities drive late HIV diagnosis: The role of black racial concentration, income inequality, socioeconomic deprivation, and HIV testing. *Health and Place*, *42*, 148-158. doi:10.1016/j.healthplace.2016.09.004

Ravitch, S. M., & Riggan, M. (2017). *Reason & rigor: how conceptual frameworks guide research* (2nd ed.). Los Angeles, CA: Sage.

Rendina, H. J., Cienfuegos-Szalay, J., Talan, A., Jones, S. S., & Jimenez, R. H. (2020). Growing Acceptability of Undetectable = Untransmittable but Widespread Misunderstanding of Transmission Risk: Findings From a Very Large Sample of Sexual Minority Men in the United States. *Journal of acquired immune deficiency syndromes (1999), 83*(3), 215-222. doi:10.1097/QAI.0000000000002239

Rendina, H. J., & Parsons, J. T. (2018). Factors associated with perceived accuracy of the Undetectable = Untransmittable slogan among men who have sex with men: Implications

for messaging scale-up and implementation. *Journal of the International AIDS Society*(1). doi:10.1002/jia2.25055

Rendina, H. J., Talan, A. J., Cienfuegos-Szalay, J., Carter, J. A., & Shalhav, O. (2020). Treatment Is More Than Prevention: Perceived Personal and Social Benefits ofUndetectable = UntransmittableMessaging Among Sexual Minority Men Living with HIV. *Aids Patient Care and Stds, 34*(10), 444-451. doi:10.1089/apc.2020.0137

Rice, W. S., Fletcher, F. E., Akingbade, B., Kan, M., Whitfield, S., Ross, S., . . . Turan, J. M. (2020). Quality of care for Black and Latina women living with HIV in the U.S.: a qualitative study. *International journal for equity in health, 19*(1), 115. doi:10.1186/s12939-020-01230-3

Richter, D. L., Sowell, R. L., & Pluto, D. M. (2002). Attitudes toward antiretroviral therapy among African American women. *American Journal of Health Behavior, 26*(1), 25-33. doi:10.5993/AJHB.26.1.3

Roberts, K., Dowell, A., & Nie, J.-B. (2019). Attempting rigour and replicability in thematic analysis of qualitative research data; a case study of codebook development. *BMC Medical Research Methodology, 19*(1), 66-66. doi:10.1186/s12874-019-0707-y

Roberts, K. J., & Mann, T. (2003). Adherence to antiretroviral medications in HIV/AIDS care: A narrative exploration of one woman's foray into intentional nonadherence. *Health Care for Women International, 24*(6), 552-564. doi:10.1080/07399330390199537

Rodger, A., Cambiano, V., Bruun, T., Vernazza, P., Collins, S., Degen, O., . . . Lundgren, J. (2018). *HIV transmission risk through condomless sex in gay couples with suppressive ART: The PARTNER2 Study extended results in gay men* Retrieved from

https://programme.aids2018.org/PAGMaterial/PPT/6213_8403/WEAX0104LB_RODGER_PARTNER2_AIDS2018%20.pdf

Rodger, A. J., Bruun, T., Vernazza, P., Collins, S., Estrada, V., Van Lunzen, J., . . . Grp, P. S. (2013). Further research needed to support a policy of antiretroviral therapy as an HIV prevention initiative. *Antiviral Therapy, 18*(3), 285-287. doi:10.3851/imp2609

Rodger, A. J., Cambiano, V., Bruun, T., Vernazza, P., Collins, S., Degen, O., . . . Group, P. S. (2019). Risk of HIV transmission through condomless sex in serodifferent gay couples with the HIV-positive partner taking suppressive antiretroviral therapy (PARTNER): final results of a multicentre, prospective, observational study. *Lancet, 393*(10189), 2428-2438. doi:10.1016/S0140-6736(19)30418-0

Rodger, A. J., Cambiano, V., Bruun, T., Vernazza, P., Collins, S., van Lunzen, J., . . . Grp, P. S. (2016). Sexual Activity Without Condoms and Risk of HIV Transmission in Serodifferent Couples When the HIV-Positive Partner Is Using Suppressive Antiretroviral Therapy. *Jama-Journal of the American Medical Association, 316*(2), 171-181. doi:10.1001/jama.2016.5148

Rosenberg, S. D., Trumbetta, S. L., Mueser, K. T., Goodman, L. A., Osher, F. C., Vidaver, R. M., & Metzger, D. S. (2001). Determinants of risk behavior for human immunodeficiency virus/acquired immunodeficiency syndrome in people with severe mental illness. *Comprehensive psychiatry, 42*(4), 263-271.

Rosenstock, I. (1974). *Historical Origins of the Health Belief Model*. Retrieved from https://journals.sagepub.com/doi/pdf/10.1177/109019817400200403

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the Health Belief Model. *Health education quarterly, 15*(2), 175-183.

Sanchez, K., Gryczynski, J., Carswell, S. B., & Schwartz, R. P. (2020). *Development and feasibility of a Spanish language version of the Tobacco, Alcohol, Prescription drug, and illicit Substance use (TAPS) Tool*. Retrieved from https://cdn-links.lww.com/permalink/jam/a/jam_00_00_2020_06_19_sanchez_jam-d-20-00015_sdc1.pdf

Sankar, A., Luborsky, M., Schuman, P., & Roberts, G. (2002). Adherence discourse among African-American women taking HAART. *AIDS Care, 14*(2), 203-218. doi:10.1080/09540120220104712

Schrimshaw, E. W., Siegel, K., & Lekas, H.-M. (2005). Changes in attitudes toward antiviral medication: A comparison of women living with HIV/AIDS in the pre-HAART and HAART eras. *AIDS and Behavior, 9*(3), 267-279. doi:10.1007/s10461-005-9001-6

Schuster, M. A., Kanouse, D. E., Morton, S. C., Bozzette, S. A., Miu, A., Scott, G. B., & Shapiro, M. F. (2000). HIV-infected parents and their children in the United States. *Am J Public Health, 90*(7), 1074-1081. doi:10.2105/ajph.90.7.1074

Severy, L. J. (1974). *Procedures and Issues in the Measurement of Attitudes. TM Report No. 30*. Retrieved from Princeton N. J.: http://0-search.ebscohost.com.lib.utep.edu/login.aspx?direct=true&db=eric&AN=ED099426&site=eds-live&scope=site

Shayne, V. T., & Kaplan, B. J. (1991). Double victims: Poor women and AIDS. *Women & Health, 17*(1), 21-37. doi:10.1300/J013v17n01_02

Shedlin, M. G., Decena, C. U., & Beltran, O. (2013). Geopolitical and Cultural Factors Affecting ARV Adherence on the US-Mexico Border. *Journal of Immigrant and Minority Health*(5), 969. doi:10.1007/s10903-012-9681-8

Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research, 15*(3), 325-343. doi:10.1086/209170

Short, S. E., & Mollborn, S. (2015). Social determinants and health behaviors: conceptual frames and empirical advances. *Current Opinion in Psychology, 5*(1), 78-84.

Siegel, K., & Gorey, E. (1997). HIV-infected women: Barriers to AZT use. *Social Science & Medicine, 45*(1), 15-22. doi:10.1016/S0277-9536(96)00303-6

Simek, M. (2017). Undetectable equals untransmittable: Groundbreaking prevention campaign takes the world by storm. *Positively Aware, 29*(5), 22-25.

Singer, M. (1996). A dose of drugs, a touch of violence, a case of AIDS: conceptualizing the SAVA syndemic. *Free Inquiry in Creative Sociology, 24*(2), 99-110.

Singer, M., & Clair, S. (2003). Syndemics and public health: reconceptualizing disease in bio-social context. *Medical anthropology quarterly, 17*(4), 423-441.

Skarbinski, J., Rosenberg, E., Paz-Bailey, G., Hall, H. I., Rose, C. E., Viall, A. H., . . . Mermin, J. H. (2015). Human immunodeficiency virus transmission at each step of the care continuum in the United States. *JAMA internal medicine, 175*(4), 588-596.

Skevington, S. M., Lotfy, M., O'Connell, K. A., & Group, W. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Qual Life Res, 13*(2), 299-310. doi:10.1023/B:QURE.0000018486.91360.00

Smith, B. M. (1947). The Personal Setting of Public Opinions: A Study of Attitudes Toward Russia. *The Public Opinion Quarterly, 11*(4), 507-523.

Sneed, C. D., & Morisky, D. E. (1998). Applying the Theory of Reasoned Action to condom use among sex workers. *Social Behavior & Personality: an international journal, 26*(4), 317-328. doi:10.2224/sbp.1998.26.4.317

Solorio, R., Forehand, M., & Simoni, J. (2013). Attitudes towards and Beliefs about HIV Testing among Latino Immigrant MSM: A Comparison of Testers and Nontesters. *AIDS research and treatment, 2013*, 563537-563537. doi:10.1155/2013/563537

Sormanti, M., Wu, E., & El-Bassel, N. (2004). Considering HIV risk and intimate partner violence among older women of color: a descriptive analysis. *Women & health, 39*(1), 45-63.

Sowell, R. L., Phillips, K. D., Murdaugh, C., & Tavokali, A. (1999). Health care providers' influence on HIV-infected women's beliefs and intentions related to AZT therapy. *Clinical Nursing Research, 8*(4), 336-354. doi:10.1177/10547739922158340

Strathdee, S. A., Magis-Rodriguez, C., Mays, V. M., Jimenez, R., & Patterson, T. L. (2012). The emerging HIV epidemic on the Mexico-U.S. border: an international case study characterizing the role of epidemiology in surveillance and response. *Annals Of Epidemiology, 22*(6), 426-438. doi:10.1016/j.annepidem.2012.04.002

Substance Abuse and Mental Health Services Administration. (2019). *Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health*. Retrieved from Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration: https://www.samhsa.gov/data/

Substance Abuse and Mental Health Services Administration. (2020a). *2019 National Survey on Drug Use and Health: Women*. Retrieved from

https://www.samhsa.gov/data/sites/default/files/reports/rpt31102/2019NSDUH-Women/Women%202019%20NSDUH.pdf

Substance Abuse and Mental Health Services Administration. (2020b). *Key Substance Use and Mental Health Indicators in the United States: Results from the 2019 National Survey on Drug Use and Health*. Retrieved from Rockville, MD: https://www.samhsa.gov/data/sites/default/files/reports/rpt29393/2019NSDUHFFRPDFWHTML/2019NSDUHFFR1PDFW090120.pdf

Substance Abuse and Mental Health Services Administration. (2020c). *Mental Health Annual Report: 2013–2018. Use of Mental Health Services: National Client-Level Data*. Retrieved from Rockville, MD: https://www.samhsa.gov/data/sites/default/files/reports/rpt29396/2018-MHCLD/MHCLD-2018-R.pdf

Sullivan, L. M. (2012). Power and sample size determination. In R. Riegelman (Ed.), *Essentials of Biostatistics in Public Health* (2nd ed., pp. 169-188). Burlington, MA: Jones & Bartlett Learning.

Sullivan, P. S., McNaghten, A. D., Begley, E., Hutchinson, A., & Cargill, V. A. (2007). Enrollment of racial/ethnic minorities and women with HIV in clinical research studies of HIV medicines. *Journal of the National Medical Association, 99*(3), 242-250.

Supriya, K., Sandra Crouse, Q., Kevin, H. K., Donald, M., Karen, M. H., & Vicki, S. F. (2012). The Social Ecological Model as a Framework for Determinants of 2009 HINI Influenza Vaccine Uptake in the United States. *Health Education & Behavior, 39*(2), 229.

Tanzania Stigma-Indicators Field Test Group. (2005). *Working report measuring HIV stigma: Results of a field test in Tanzania*. Retrieved from Washington, DC:

https://www.icrw.org/wp-content/uploads/2016/10/Working-Report-Measuring-HIV-Stigma-Results-of-a-Field-Test-in-Tanzania.pdf

Teran, R. A., Carrico, A. W., Horvath, K. J., Downing, M. J., Chiasson, M. A., Walters, S. M., . . . Downing, M. J., Jr. (2020). Stimulant Use and Study Protocol Completion: Assessing the Ability of Men Who Have Sex with Men to Collect Dried Blood Spots for Laboratory Measurement of HIV Viral Load. *Archives of Sexual Behavior*, *49*(1), 195-209. doi:10.1007/s10508-019-01515-x

Texas Council on Family Violence. (2019). *Honoring Texas Victims: Family Violence Fatalities of 2018*. Retrieved from http://tcfv.org/wp-content/uploads/2019/12/2018HTV_FullReport_OnlineVersion.pdf

Texas Department of Public Safety. (2017). Crime by jurisdiction. In *The Texas Crime Report for 2017*.

Texas Department of Public Safety. (2018a). *2018 Crime in Texas: Family Violence*. Retrieved from www.dps.texas.gov/crimereports/18/citCh5.pdf

Texas Department of Public Safety. (2018b). Crime by Jurisdiction. In *The Texas Crime Report for 2018*.

Texas Department of Public Safety. (2019). *Crime in Texas 2019*. Retrieved from https://www.dps.texas.gov/crimereports/19/cit2019.pdf

Texas Department of State Health Services. (2020a). *Black Women and HIV in Texas*. Retrieved from https://www.dshs.state.tx.us/hivstd/info/edmat/BlackWomenandHIV.pdf

Texas Department of State Health Services. (2020b). *HIV and Women in Texas*. Retrieved from https://www.dshs.state.tx.us/hivstd/info/edmat/HIVinWomen.pdf

Texas Department of State Health Services. (2020c). *Texas HIV Epidemiologic Profile, 2018*. Retrieved from https://www.dshs.texas.gov/hivstd/reports/epi_profile/files/EpiProfile.pdf

Texas Department of State Health Services HIV/STD Program. (2016). *HIV/STD Health Disparities in Texas* (No. E13-14002). Retrieved from https://www.dshs.texas.gov/hivstd/info/edmat/HealthDisparities.pdf

Texas Health and Human Services, Texas Department of State Health Services, HIV/STD Epidemiology and Surveillance Branch. (2019). *Texas HIV Surveillance Report: 2018 Annual Report*. Retrieved from https://www.dshs.texas.gov/hivstd/reports/HIVSurveillanceReport.pdf

Thomas, G. R., & John, R. C. W. (1979). Factors Associated with Utilization of the Swine Flu Vaccination Program among Senior Citizens in Tompkins County. *Medical Care, 17*(2), 191.

Thomas, K., & Tuck, M. (1975). An exploratory study of determinant and indicant beliefs in attitude measurement. *European Journal of Social Psychology, 5*(2), 167.

Thomford, N. E., Mhandire, D., Dandara, C., & Kyei, G. B. (2020). Promoting Undetectable Equals Untransmittable in Sub-Saharan Africa: Implication for Clinical Practice and ART Adherence. *International Journal of Environmental Research and Public Health, 17*(17). doi:10.3390/ijerph17176163

Thurstone, L. L. (1928). Attitudes Can Be Measured. *American Journal of Sociology, 33*(4), 529-554.

Thurstone, L. L. (1931). The measurement of social attitudes. *The Journal of Abnormal and Social Psychology, 26*(3), 249-269. doi:10.1037/h0070363

Thurstone, L. L. (1949). The Measurement of Attitudes. In W. Dennis (Ed.), *Readings in general psychology*. (pp. 405-414). New York, NY: Prentice-Hall, Inc.

Torres, T. S., Marins, L. M. S., Bezerra, D. R. B., Veloso, V. G., Grinsztejn, B., & Luz, P. M. (2020). A call to improve understanding of Undetectable equals Untransmissible (U=U) slogan in Brazil. *Journal of the International Aids Society, 23*, 147-148.

U.S. Bureau of Labor Statistics. (2019). Local area unemployment statistics. https://data.bls.gov/pdq/SurveyOutputServlet

U.S. Census Bureau. (2019). Quick Facts: El Paso County, TX. Retrieved from https://www.census.gov/quickfacts/elpasocountytexas

U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (n.d.). Healthy People 2030: Social Determinants of Health. Retrieved from https://health.gov/healthypeople/objectives-and-data/social-determinants-health

United Nations Children's Emergency Fund. (2015). Adolescent deaths from AIDS tripled since 2000 [Press release]. Retrieved from https://www.unicef.org/media/media_86384.html

United Nations International Children's Fund. (2017). *Children and AIDS: Statistical update*. Retrieved from file:///C:/Users/BIRDY/Downloads/HIVAIDS-Statistical-Update-2017.pdf

United States Agency for International Development Inter-Agency Working Group on Stigma and Discrimination. (2004). *HIV-Related Stigma and Discrimination Indicators Development Workshop Report*. Retrieved from Washington, DC:

United States Census Bureau. (2019). El Paso County American Community Survey Demographic and Housing Estimates: 2018 ACS 1-Year Estimates Data Profiles. Retrieved from

https://data.census.gov/cedsci/table?g=0500000US48141&tid=ACSDP1Y2018.DP05&hidePreview=false&vintage=2018&layer=VT_2018_050_00_PY_D1&cid=DP05_0001E

Vaaler, M., Surita, K., O'Hara, B., & Ripperger-Suhler, K. (2014). *Spectrum of Engagement in Care Symposium: Pathways to Linkage* Retrieved from file:///C:/Users/vasqu/Downloads/PathwaysToLinkage_Vaaler.pdf

Valverde, E. E., Painter, T., Heffelfinger, J. D., Schulden, J. D., Chavez, P., & DiNenno, E. A. (2015). Migration Patterns and Characteristics of Sexual Partners Associated with Unprotected Sexual Intercourse Among Hispanic Immigrant and Migrant Women in the United States. *Journal of immigrant and minority health, 17*(6), 1826-1833. doi:10.1007/s10903-014-0132-6

van Buuren, S. (2018). *Flexible imputation of missing data* (Second edition. ed.). Boca Raton, FL: Chapman and Hall/CRC, an imprint of Taylor and Francis.

Van de Ven, P., Crawford, J., Kippax, S., Knox, S., & Prestage, G. (2000). A scale of optimism-scepticism in the context of HIV treatments. *AIDS Care, 12*(2), 171-176. doi:10.1080/09540120050001841

Verghese, A., Nabhan, D., Escobedo, M. A., Guardado, J., Guerra, L. G., Ho, H., . . . Berk, M. L. (1995). Profile of HIV disease in an American border city. *Southern Medical Journal, 88*(4), 429-432.

Vermund, S. H., Tique, J. A., Cassell, H. M., Pask, M. E., Ciampa, P. J., & Audet, C. M. (2013). Translation of Biomedical Prevention Strategies for HIV: Prospects and Pitfalls. *JAIDS Journal of Acquired Immune Deficiency Syndromes, 63*(Suppl. 1), S12-S25.

Vernazza, P. L., & Hirschel, B. (2008). HIV transmission hunting - the chase for low risk events. *Antiviral Therapy, 13*(5), 641-642.

Vithayasai, V., Moyle, G. J., Supajatura, V., Wattanatchariya, N., Kanshana, S., Sirichthaporn, P., . . . Hawkins, D. (2002). Safety and efficacy of saquinavir soft-gelatin capsules + zidovudine + optional lamivudine in pregnancy and prevention of vertical HIV transmission. *Journal of acquired immune deficiency syndromes (1999), 30*(4), 410-412. doi:10.1097/00042560-200208010-00006

Volberding, P. A., Lagakos, S. W., Koch, M. A., Pettinelli, C., Myers, M. W., Booth, D. K., . . . Corey, L. (1990). Zidovudine in asymptomatic Human-Immunodeficiency-Virus infection - a controlled trial in persons with fewer than 500 cd4-positive cells per cubic millimeter. *New England Journal of Medicine, 322*(14), 941-949. doi:10.1056/nejm199004053221401

Wagner, R. V. (1969). *The study of attitude change / edited by Richard V. Wagner [and] John J. Sherwood*. Belmont, Calif: Brooks/Cole.

Wanyenze, R. K., Musinguzi, G., Kiguli, J., Nuwaha, F., Mujisha, G., Musinguzi, J., . . . Matovu, J. K. B. (2017). "When they know that you are a sex worker, you will be the last person to be treated": Perceptions and experiences of female sex workers in accessing HIV services in Uganda. *BMC International Health & Human Rights, 17*, 1-11. doi:10.1186/s12914-017-0119-1

Warren, E. A., Paterson, P., Schulz, W. S., Lees, S., Eakle, R., Stadler, J., & Larson, H. J. (2018). Risk perception and the influence on uptake and use of biomedical prevention interventions for HIV in sub-Saharan Africa: A systematic literature review. *PLoS ONE, 13*(6), 1-18. doi:10.1371/journal.pone.0198680

Webel, A. R. (2015). A review of measures examining the attitudes, beliefs, and behaviors related to physical health and illness.

Weinhardt, L. S., Carey, M. P., & Carey, K. B. (1998). HIV-risk behavior and the public health context of HIV/AIDS among women living with a severe and persistent mental illness. *The Journal of nervous and mental disease, 186*(5), 276-282.

Weiss, N. H., Tull, M. T., Borne, M. E. R., & Gratz, K. L. (2013). Posttraumatic stress disorder symptom severity and HIV-risk behaviors among substance-dependent inpatients. *AIDS care, 25*(10), 1219-1226. doi:10.1080/09540121.2013.764381

Wendlandt, R., Salazar, L. F., Mijares, A., & Pitts, N. (2016). Gender-based violence and HIV risk among African American women: A qualitative study. *Journal of HIV/AIDS & Social Services, 15*(1), 83.

Whetten, K., Reif, S., Whetten, R., & Murphy-McMillan, L. K. (2008). Trauma, mental health, distrust, and stigma among HIV-positive persons: implications for effective care. *Psychosomatic medicine, 70*(5), 531-538. doi:10.1097/PSY.0b013e31817749dc

White House Office of National AIDS Policy. (2015). *National HIV/AIDS Strategy for the United States: Updated to 2020*. Retrieved from https://files.hiv.gov/s3fs-public/nhas-update.pdf

Whitehead, M. (2007). A typology of actions to tackle social inequalities in health*(6)*, 473. Retrieved from http://0-search.ebscohost.com.lib.utep.edu/login.aspx?direct=true&db=edsgih&AN=edsgcl.165340050&site=eds-live&scope=site

Wilkinson, A. L., Draper, B. L., Pedrana, A. E., Asselin, J., Holt, M., Hellard, M. E., & Stoové, M. (2018). Measuring and understanding the attitudes of Australian gay and bisexual men towards biomedical HIV prevention using cross-sectional data and factor analyses. *Sexually transmitted infections, 94*(4), 309-314. doi:10.1136/sextrans-2017-053375

Williams, D. R. (2012). Miles to Go before We Sleep: Racial Inequalities in Health. *Journal of Health and Social Behavior, 53*(3), 279-295.

Winfield, E. B., & Whaley, A. L. (2002). A Comprehensive Test of the Health Belief Model in the Prediction of Condom Use Among African American College Students. *Journal of Black Psychology, 28*(4).

World Health Organization. (2004). *The World Health Organization Quality of Life (WHOQOL)-BREF*. Retrieved from Geneva, Switzerland: https://www.infontd.org/media/647/download

Yep, G. A. (1993). HIV prevention among Asian-American college students: does the health belief model work? *Journal Of American College Health: J Of ACH, 41*(5), 199-205.

Zohrabi, M. (2013). Mixed Method Research: Instruments, Validity, Reliability and Reporting Findings. *Theory and practice in language studies, 3*(2), 254. doi:10.4304/tpls.3.2.254-262

Tables

Table 1*: Interview Characteristics*

Characteristic	n	% Mean (SD)
In-person Interviews	13	61.9
Online Interviews	8	38.1
SUD CBO	14	66.7
Women's Shelter	3	14.3
Outside of Facility	4	19.0
Interview time (*Minutes*)	21	29.9 (4.8)

Note: All interviews were done in English. *CBO – Community-Based Organization, SUD – substance use disorder.*

Table 2: *Demographics of Interview Participants (N = 21)*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Race/Ethnicity		
Hispanic	14	66.7
African American	2	9.5
Native American/American Indian	1	4.8
Biracial	2	9.5
Other – Black/African	2	9.5
Age (*Years*)	21	30.0 (26.5, 35.0)
Children (*Count*)	21	2.3 (2.1)
Employed		
Yes	1	4.8
No	20	95.2
Education Completed		
Master's Degree and Higher	3	14.3
Bachelor's Degree	1	4.8
Associates Degree	2	9.5
Vocational Training After High School	2	9.5
High School	11	52.4
Elementary/Middle School	2	9.5
Birth Country		
United States	17	81
Outside United States	3	14.3
United States Residence (*Years*)	3	6.5 (2.5, -)

Table 3: *Health–related Characteristics of Interview Participants*

Health-related Characteristic	n	%
Mental Health Diagnosis		
Yes	11	52.4
No	10	47.6
Specific Diagnosis		
ADD	1	4.8
Anxiety	4	19
Bipolar	5	23.8
Depression	3	14.3
PTSD	2	9.5
Schizophrenia	1	4.8
Under Evaluation	1	4.8
HIV Diagnosis		
Yes	1	4.8
No	20	95.2
Taken Pre-exposure Prophylaxis (PrEP)		
Yes	0	0
No	21	100
Intimate Partner Violence		
Yes	5	23.8
No	16	76.2
Know Someone w/HIV/AIDS		
Yes	10	47.6
No	11	52.4
Know someone who died of AIDS		
Yes	6	28.6
No	15	71.4

Note. ADD – attention deficit disorder; PTSD – posttraumatic stress disorder.

Table 4: *General Patterns of Perceptions and Attitudes of Interview Participants*

Characteristic	n	% Mean (SD)
Perception of HIV Risk		
High	8	38.1
Medium	1	4.8
Low	11	52.4
No thought	1	4.8
Attitude toward PLHIV		
Positive	19	90.5
Negative	2	9.5
Attitude toward Treatment		
Positive	15	71.4
Negative	2	9.5
Positive and Negative	4	19.1
Aware of U = U		
Yes	5	23.8
No	16	76.2
Believe in U = U		
Yes	7	33.3
No	10	47.6
Unsure/Maybe	4	19.1
Perceive sexual risk of transmission w/ U = U		
Yes	21	100
No	0	0
Family/Community Attitudes Toward U=U		
Positive	7	33.3
Negative	9	42.9
Maybe (50-50)	5	23.8
U = U should be Promoted		
Yes	20	95.2
No	1	4.8

Note. PLHIV – people living with HIV; U = U – undetectable equals untransmittable.

Table 5: *Data Analysis Map – Research Domains and Emergent Themes*

Data analysis section	Emergent themes	Sub-themes	Units discussed
Domain 1: Perceptions of HIV Risk	Risk factor awareness	Misconceptions	Sexual risks
			Lack of sex
			Substance use w/wo IDU
			Transmission routes
	Discrepancy between risk perception and behavior: high-risk behavior but low perception of risk	Risk levels	Pre-rehabilitation HIV risk behaviors vs. current HIV risk perceptions
	Testing practices	Lack of testing	Fear of testing Reasons for frequent testing Reasons for infrequent testing
		STD experience	Awareness of other STDs w/wo HIV Testing for other STDs
Domain 2: Attitudes Toward PLHIV	Friends and Family with HIV	Others HIV experience	Acquisition of HIV Experiences of PLHIVA
	No judgment		No thought or not bothered by HIV
			Anyone can get HIV unknowingly and without fault
			PLHIVA are no different than others, normal everyday people
	Support and Compassion	Encourage HIV testing	Sympathy and understanding toward PLHIVA
			Encourage others to get tested
	HIV fear, stigma and discrimination	Personal vs. community	Being embarrassed by PLHIV

Table 5: *Data Analysis Map – Research Domains and Emergent Themes*

Data analysis section	Emergent themes	Sub-themes	Units discussed
			Rejection of PLHIV
			Fearing to interact with PLHIV
			Perpetrated at the community level not personally
Domain 3: Attitudes Toward HIV Treatment	HIV is treatable and it's for the best	Lack of knowledge about HIV treatment	People are living longer and healthier with HIV and having normalcy and hope
			HIV is no longer a death sentence
			HIV is like any other disease
			Adherence to medication is important
			Not knowing the information about specific HIV treatments or how they work
			Belief that there is a cure for HIV that is being hidden/kept secret
	Negative impact		Effects on immune system and the body
			Getting worst before getting better
			Treatment does not work if HIV is not completely eliminated
Domain 4: Awareness and Attitudes Toward U = U	U = U unawareness		Never heard the phrase before
			Confusion/misconceptions about what the phrase really means
	Individual beliefs		
	I believe it, but I don't	I don't believe it	Disbelief due to various reasons; once you have it, you have it

Table 5: *Data Analysis Map – Research Domains and Emergent Themes*

Data analysis section	Emergent themes	Sub-themes	Units discussed
		Yes, I believe it	You can [still] pass it on Belief due to various reasons, especially Science/facts
			Don't think it can be passed on
		In the middle: doubt and fear	Cannot be one hundred percent sure or unsure
			Persistence of fear and doubt not due to disbelief in U = U
	Positive impact on PLHIV	Normal life and identity, hope, peace of mind	Feeling good, having an easier experience, living a normal and long life with hope
			Experiencing compassion and acceptance
			Being more confident
			Continue to be safe
		No change	Undetectable status will not have any impact on any aspect of the PLHIV life
		Negative impact	Scared of sex and relationship
			Embarrass to disclose status
	I just wouldn't chance my life with it - Perceived risks due to U = U	If it's someone you love	Risk due to possible transmission of HIV even if the PLHIV has an undetectable status
			Willing to take risks if it is an established relationship

Table 5: *Data Analysis Map – Research Domains and Emergent Themes*

Data analysis section	Emergent themes	Sub-themes	Units discussed
			Risk behaviors by PLHIV being irresponsible and careless once they achieve an undetectable status
	Community beliefs		
	People see it different ways; it's a fifty-fifty (Acceptance of U = U by some)		People have different opinions and some may be more accepting and open-minded, compassionate Some people are cruel and stubborn and set in their ways Lack of knowledge about U = equals U is a main driver of unacceptance of U = equals U; need to be educated HIV is not common or not talked about, it is a forgotten disease
	Lack of knowledge (Cultural, religious and social norms)	Hispanic moms and dads (not necessarily)	Hispanic culture, machismo, and other cultures The way they grew up, not having up-to-date information; older generation vs. younger generation Religion causing rejection of U=U Language barriers
	Yes, a hundred, a thousand percent, yes!	Barriers to U = U	Beneficial for PLHIVA, community Needed in El Paso due to the growing LGBTQ population

Table 5: *Data Analysis Map – Research Domains and Emergent Themes*

Data analysis section	Emergent themes	Sub-themes	Units discussed
	(Promotion of U = U)		Strategies to promote the U = U message Religion, moral fabric of society, government, perceived risks of the message, race, the individual credentials sharing the message, no barriers

IDU – Injection drug use; LGBTQ – Lesbians, gay, bisexual, transgender, queer; PLHIVA – People living with HIV/AIDS; STD – sexually transmitted disease; U = U – Undetectable equals untransmittable.

Table 6: *Demographics of Survey Participants (N = 134)*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Race/Ethnicity		
Hispanic	68	50.7
Black/African American	49	36.6
AA, NH, OPI	9	6.7
NA/AI	3	2.2
Biracial	4	3.0
Multiracial	1	0.7
Age (*Years*)	134	35.0 (28.8, 41.0)
Marital Status		
Single	43	32.3
Married	50	37.6
Widowed	3	2.3
Separated	7	5.3
Divorce	16	12.0
Cohabitating	9	6.8
Common law	4	3.0
Civil union	1	0.8
Education Completed		
Master's Degree	5	3.7
Bachelor's Degree	36	27.1
Associates Degree	22	16.5
Vocational Training After High School	31	23.3
High School	31	23.3
Elementary/Middle School	3	2.3
No Formal Education	5	3.8
Religion		
Christian	112	84.2
Islam	1	0.8
Other	9	6.8
Catholic	8	100
None	11	8.3
Sexual Orientation		
Heterosexual (Straight)	107	80.5
Homosexual (Lesbian)	11	8.3
Bisexual	13	9.8

Table 6: *Demographics of Survey Participants (N = 134)*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
None	2	1.5
Employed		
Yes	95	73.1
No	35	26.9
Employment Status		
Full-time	84	74.3
Part-time	9	8.0
N/A	20	17.7
Annual Income (*Dollars*)	134	35,500 (17,000, 50,000)
Birth Country		
United States	113	86.3
Outside United States	18	13.7
United States Residence (*Years*)	18	19.6 (14.1)

Note. Some variables have a different *n* because of missing data. AI – American Indian; AA – Asian American; NA – Native American; NH – Native Hawaiian; OPI – Other Pacific Islander.

Table 7*: HIV-related Variables and U=U Awareness Among Survey Participants*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
HIV Test		
Yes	89	67.4
No	43	32.6
HIV Status		
Yes	4	3.0
No	130	97.0
ART		
Yes	3	75.0
No	1	25.0
PrEP Prescription		
Yes	41	32.0
No	87	68.0
Aware U=U		
Yes	90	69.2
No	40	30.8
Source U=U		
Healthcare provider	41	35.3
Family/friends	9	7.8
Print media	11	9.5
Social media	20	17.2
Other	12	10.3
SUD CBO	5	41.7
Work	2	16.7
School	1	8.3
Health promotion program	1	8.3
TV programs	1	8.3
Foster care	1	8.3
Clinic	1	8.3
NA	23	19.8

Note. ART – antiretroviral therapy, CBO – community-based organization, PrEP – pre-exposure prophylactic, SUD – substance use disorder, U = U – undetectable equals untransmittable. Some variables have a different *n* because of missing data.

Table 8*: Health-related Variables Among Survey Participants*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Anxiety Screen		
Positive	62	46.6
Negative	71	53.4
Depression Screen		
Positive	57	42.5
Negative	77	57.5
HIV Risk Perception	134	17.0 (14.0, 21.0)
HIV Risk-Taking Behavior	134	6.0 (0.0, 10.0)
Tobacco Use		
Positive SUD	66	49.3
Positive problem use	23	17.2
Negative	45	33.6
Alcohol Use Screen		
Positive SUD	72	53.7
Positive problem use	29	21.6
Negative	33	24.6
Illicit Drug Use		
Positive SUD	33	24.6
Positive problem use	10	7.5
Negative	91	67.9
Prescription Drug Use		
Positive SUD	18	13.4
Positive problem use	15	11.2
Negative	101	75.4
Quality of Life		
Good	81	60.4
Not good	53	39.6

Note. SUD – substance use disorder. Some variables have a different *n* because of missing data.

Table 9: *Social Media Use Among Survey Participants*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Social Media Accounts		
6-10 accounts	16	11.9
3-5 accounts	46	34.3
Two accounts	35	26.1
One account	26	19.4
None	11	16.2
Time on Social Media Daily		
>3 hours	8	6.2
2-3 hours	30	23.1
1-2 hours	45	34.6
30-60 minutes	26	20.0
<30 minutes	21	16.2
Social Impact on Attitude		
Very high	8	6.2
High	32	24.6
Some	53	40.8
Minimal	15	11.5
None	22	16.9

Table 10*: Individual Attitude Towards PLWHA Among Survey Participants*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Attitude toward PLWHA	134	25.5 (14.0, 35.0)
Attitude toward HIV RX Prevention		
Positive	29	21.6
Negative	105	78.4
Attitude toward HIV RX Necessary		
Positive	108	80.6
Negative	26	19.4
Attitude Outcomes to U Equals U		
Accuracy beliefs		
Completely accurate	63	47.0
Not accurate	71	53.0
Risk perception		
Risk present	90	67.2
No risk present	44	32.8
Condomless sex		
Likely	23	17.2
Unlikely	111	82.8

Note. PLWHA – people living with HIV/AIDS, RX – treatment, U equals U – undetectable equals untransmittable. Some variables have a different *n* because of missing data.

Table 11*: Interpersonal Factors Among Survey Participants*

Characteristic	n	% Mean (SD) Median (Q1, Q3)
Perceived Social Support	134	22.0 (19.8, 25.0)
Family living with HIV		
Yes	11	8.2
No	123	91.8
Friend living with HIV		
Yes	33	24.6
No	101	75.4
Intimate Partner Violence		
Abused	11	8.3
Not abused	122	91.7

Note. Some variables have a different *n* because of missing data.

Table 12: *Organization, Community and Neighborhood Factors Among Survey Participants*

Characteristic	n	Freq (%)
Organization		
Have PCP		
Yes	99	78.6
No	27	21.4
Comfortable with PCP		
Agree	74	65.5
Disagree	39	34.5
Satisfaction with PCP		
Satisfied	86	74.8
Not satisfied	29	25.2
Commute to PCP		
60 minutes+	20	18.2
30-59 minutes	55	50.0
<30 minutes	35	31.8
Community Attitudes toward PLHIV		
Most people would not buy vegetables		
Agree	82	63.6
Disagree	47	36.4
Most people think HIV RX is effective		
Agree	76	57.6
Disagree	56	42.4
Most people will trust U equals U		
Agree	61	46.6
Disagree	70	53.4
Perceived risk behavior w/ U equals U		
Agree	49	37.1
Disagree	83	62.9
Neighborhood Characteristics		
People can be trusted		
Agree	71	55.0
Disagree	58	45.0

Table 12: *Organization, Community and Neighborhood Factors Among Survey Participants*

Characteristic	n	Freq (%)
People afraid to go out		
Agree	19	14.7
Disagree	110	85.3
Gang is issue		
Agree	21	16.2
Disagree	109	83.8
People get along		
Agree	69	53.1
Disagree	61	46.9
Public transport accessible		
Agree	81	63.8
Disagree	46	36.2

Note. PCP – primary care provider; PLHIV – people living with HIV; RX – treatment. Some variables have a different *n* because of missing data.

Table 13*: Bivariate Associations between Belief in the Accuracy of U Equals U and Demographic Characteristics*

			Belief in the accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	(%) Mean (SD)	N	(%) Mean (SD)	
Belief in accuracy of U equals U	134						
Completely accurate		63 (47)					
Not accurate		71 (53)					
Race/Ethnicity	134						Chi-Square p <0.001
Hispanic		68 (50.7)	49	72.1	19	27.9	
Black/African American		49 (36.6)	11	22.4	38	77.6	
Other (AA, NH, OPI, bi and multiracial		17 (12.6)	11	64.7	6	35.3	
Age (*Years*)	134	35.0 (28.8, 41.0)	71		63		Mann-Whitney U p = 0.055
Marital Status	134						Likelihood Ratio p <0.001
Single		43 (32.3)	33	76.7	10	23.3	
Married		50 (37.6)	16	32.0	34	68.0	
Widowed/Separated		10 (7.6)	7	70.0	3	30.0	
Divorce		16 (12.0)	6	37.5	10	62.5	

Table 13*: Bivariate Associations between Belief in the Accuracy of U Equals U and Demographic Characteristics*

			Belief in the accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	(%) Mean (SD)	N	(%) Mean (SD)	
Other (Cohabitating, common law, civil union) Common law Civil union		14 (10.4)	8	57.1	6	42.9	
Education Completed	133						Likelihood Ratio p = 0.024
Master's Degree		5 (3.8)	3	60.0	2	40.0	
Bachelor's Degree		36 (27.1)	12	33.3	24	66.7	
Associates Degree		22 (16.5)	12	54.5	10	45.5	
Vocational Training After High School		31 (23.3)	18	58.1	13	41.9	
High School		31 (23.3)	20	64.5	11	35.5	
Elementary/Middle School		3 (2.3)	1	33.3	2	66.7	
No Formal Education		5 (3.7)	5	100.0	0	0.0	
Religion	133						Likelihood Ratio p <0.001
Christian		112 (84.2)	51	45.5	61	54.5	

Table 13*: Bivariate Associations between Belief in the Accuracy of U Equals U and Demographic Characteristics*

			Belief in the accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	(%) Mean (SD)	N	(%) Mean (SD)	
Other (Islam, Catholic)		10 (7.5)	9	90.0	1	10.0	
None		11 (8.3)	11	100.0	0	0.0	
Sexual Orientation	133						Likelihood Ratio = 0.002
Heterosexual (Straight)		107 (80.5)	48	44.9	59	55.1	
Homosexual (Lesbian)		11 (8.3)	9	81.8	2	18.2	
Bisexual		13 (9.8)	11	84.6	2	15.4	
Other (None)		2 (1.5)	2	100.0	0	0.0	
Employed	130						Chi-Square p <0.001
Yes		95 (73.1)	41	43.2	54	56.8	
No		35 (26.9)	27	77.1	8	22.9	
Employment Status	113						Likelihood Ratio p = 0.022
Full-time		84 (74.3)	35	41.7	49	58.3	
Part-time		9 (8.0)	5	55.6	4	44.4	
N/A		20 (17.7)	15	75.0	5	25.0	

Table 13*: Bivariate Associations between Belief in the Accuracy of U Equals U and Demographic Characteristics*

			Belief in the accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	(%) Mean (SD)	N	(%) Mean (SD)	
Annual Income (*Dollars*)*	118	35,500 (17,000, 50,000)	59		59		Mann-Whitney U p <0.001
Birth Country	131						Chi-Square p = 0.200
United States		113 (86.3)	57	50.4	56	49.6	
Outside United States		18 (13.7)	12	66.7	6	33.3	
United States Residence (*Years*)	18	19.6 (14.1)	12	23.86 (15.3)	6	11.17 (5.56)	*t*-test p = 0.070

Note. AI – American Indian; AA – Asian American; NA – Native American; NH – Native Hawaiian; OPI – Other Pacific Islander. Some variables have a different *n* because of missing data. Non-significant (i.e., p ≥0.05) and conditional variables such as employment status and income were not included in the regression analysis.

Table 14*: Statistically Significant Bivariate Associations with HIV-related Variables and Beliefs in the Accuracy of U Equals U*

			Beliefs in the Accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%)	N	(%)	N	(%)	
Belief in accuracy of U equals U	134						
Completely accurate		63 (47)					
Not accurate		71 (53)					
HIV Test	132						Chi-Square p = 0.021
Yes		89 (67.4)	41	46.1	46	53.9	
No		43 (32.6)	29	67.4	14	32.6	
PrEP Prescription	128						Chi-Square p <0.001
Yes		41 (32.0)	10	24.4	31	75.6	
No		87 (68.0)	56	64.4	31	35.6	
Aware U=U							Chi-Square p <0.001
Yes		90 (69.2)	33	36.7	57	63.3	
No		40 (30.8)	35	87.5	5	12.5	

Note. PrEP – pre-exposure prophylactic. U = U – undetectable equals untransmittable. Some variables have a different N because of missing data. Statistically significant = $p<0.05$.

Table 15*: Statistically Significant Bivariate Associations with Beliefs in the Accuracy of U Equals U and Health-related Variables*

			Beliefs in the Accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Median (Q1, Q3)	N	(%)	N	(%)	
Anxiety Screen	133						Chi-Square p = 0.003
Positive		62 (46.6)	24	38.7	38	61.3	
Negative		71 (53.4)	46	64.8	25	35.2	
Depression Screen	134						Chi-Square p <0.001
Positive		57 (42.5)	19	33.3	38	66.7	
Negative		77 (57.5)	52	67.5	25	32.5	
HIV Risk-Taking Behavior	134	6.0 (0.0, 10.0)	71		63		Mann-Whitney U p = 0.010
Alcohol Use Screen	134						Chi-Square p = 0.005
Positive SUD		72 (53.7)	30	41.7	40	58.3	
Positive problem use		29 (21.6)	16	55.2	13	44.8	
Negative		33 (24.6)	25	75.8	8	24.2	
Time spent on social media	130						Likelihood Ratio p <0.001
>3 hours		8 (6.2)	6	75.0	2	25.0	
2-3 hours		30 (23.1)	7	23.3	23	76.7	
1-2 hours		45 (34.6)	27	60.0	18	40.0	
30-60 minutes		26 (20.0)	11	42.3	15	57.7	
<30 minutes		21 (16.2)	17	81.0	4	19.0	

Note. SUD – substance use disorder. Some variables have a different N because of missing data. Some variables have a different N because of missing data. Non-significant (i.e., $p \geq 0.05$) and conditional variables such as time spent on social media were not included in the regression analysis.

Table 16*: Statistically Significant Bivariate Associations with Beliefs in the Accuracy of U Equals U and Individual Attitudes*

			Beliefs in the Accuracy of U equals U				
	Overall		**Not Accurate**		**Accurate**		**Test and p-value**
Characteristic	N	Freq (%) Median (Q1, Q3)	N	(%)	N	(%)	
Attitude toward PLWHA	134	25.5 (14.0, 35.0)	71		63		Mann Whitney U p <0.001
Attitude toward HIV RX Prevention	134						Chi-Square p = 0.002
Positive		29 (21.6)	8	27.6	21	72.4	
Negative		105 (78.4)	63	60.0	42	40.0	
Attitude to U Equals U							
Risk perception	134						Chi-Square p <0.001
Risk present		90 (67.2)	67	74.4	23	25.6	
No risk present		44 (32.8)	4	9.1	40	90.9	

Note. PLWHA – people living with HIV/AIDS, RX – treatment, U equals U – undetectable equals untransmittable. Some variables have a different *n* because of missing data. Statistically significant = $p \leq 0.05$.

Table 17: *Statistically Significant Bivariate Associations between Beliefs in the Accuracy of U Equals U and Organization, Community and Neighborhood Factors*

			Beliefs in the Accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%)	N	(%)	N	(%)	
Organization							Chi-Square p = 0.003
Have PCP	126						
Yes		99 (78.6)	45	45.5	54	54.4	
No		27 (21.4)	21	77.8	6	22.2	
Satisfaction with PCP	115						Chi-Square p = 0.002
Satisfied		86 (74.8)	36	41.9	50	58.1	
Not satisfied		29 (25.2)	22	75.9	7	24.1	
Commute to PCP	110						Chi-Square p <0.001
60 minutes+		20 (18.2)	10	50.0	10	50.0	
30-59 minutes		55 (50.0)	15	27.3	40	72.7	
<30 minutes		35 (31.8)	28	80.0	7	20.0	
Community Attitudes toward PLHIV							
Most people would not buy vegetables	129						Chi-Square p = 0.003
Agree		82 (63.6)	35	42.7	47	57.3	
Disagree		47 (36.4)	33	70.2	14	29.8	

Table 17: *Statistically Significant Bivariate Associations between Beliefs in the Accuracy of U Equals U and Organization, Community and Neighborhood Factors*

			Beliefs in the Accuracy of U equals U				
	Overall		Not Accurate		Completely Accurate		Test and p-value
Characteristic	N	Freq (%)	N	(%)	N	(%)	
Most people think HIV RX is effective	132						Chi-Square p <0.001
Agree		76 (57.6)	26	34.2	50	65.8	
Disagree		56 (42.4)	44	78.6	12	21.4	
Most people will trust U equals U	131						Chi-Square p <0.001
Agree		61 (46.6)	17	27.9	44	72.1	
Disagree		70 (53.4)	53	75.7	17	24.3	
Neighborhood Characteristics							
People can be trusted	129						Chi-Square p <0.001
Agree		71 (55.0)	24	33.8	47	66.2	
Disagree		58 (45.0)	43	74.1	15	25.9	
People afraid to go out	129						Chi-Square p <0.001
Agree		19 (14.7)	17	89.5	2	10.5	
Disagree		110 (85.3)	50	45.5	60	54.5	

Table 17: *Statistically Significant Bivariate Associations between Beliefs in the Accuracy of U Equals U and Organization, Community and Neighborhood Factors*

			Beliefs in the Accuracy of U equals U				
	Overall		**Not Accurate**		**Completely Accurate**		**Test and p-value**
Characteristic	N	Freq (%)	N	(%)	N	(%)	
Gang is issue	130						Chi-Square p = 0.017
Agree		21 (16.2)	16	76.2	5	23.8	
Disagree		109 (83.8)	52	47.7	57	52.3	
Public transport accessible	127						Chi-Square p = 0.003
Agree		81 (63.8)	34	42.0	47	58.0	
Disagree		46 (36.2)	32	69.6	14	30.4	

Note. PCP – primary care provider; PLHIV – people living with HIV; RX – treatment. Some variables have a different *n* because of missing data. Some variables have a different N because of missing data. Conditional variables such as satisfaction with PCP and commute to PCP were not included in the regression analysis. Statistically significant = p ≤0.05.

Table 18: *Binary Logistic Regression Model 1 for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117)*

Independent Variable	B	S.E.	p-value	OR	95% C.I.for EXP(B) Lower	Upper
Race/ethnicity						
Hispanic	Referent					
Black or African American	1.382	.869	.112	3.984	.726	21.860
Other race/ethnicities - AA, NA/AI, PI, Bi and Multiracial	.817	1.022	.424	2.264	.306	16.773
Marital Status						
Single	Referent					
Married	-.266	.950	.780	.767	.119	4.935
Widowed or separated	-.785	1.400	.575	.456	.029	7.090
Divorced	2.547	1.280	.047	12.770	1.039	156.961
Other	.461	1.246	.711	1.586	.138	18.254
Education						
Bachelor's Degree and higher	Referent					
Associates degree	1.112	.953	.243	3.041	.470	19.688
Vocational training	-1.740	.936	.063	.176	.028	1.100
High school completion	.087	1.157	.940	1.091	.113	10.538
Elementary or no education	3.316	2.055	.107	27.561	.491	1547.851
Religion						
Christian	Referent					
Other religions	-3.280	1.726	.057	.038	.001	1.108
No religion	-23.094	9642.317	.998	.000	.000	.
Sexual Orientation						
Heterosexual	Referent					
Homosexual or lesbian	-3.685	1.412	.009	.025	.002	.400
Bisexual	-2.610	1.126	.021	.074	.008	.669
All other	-15.038	23317.671	.999	.000	.000	.
Currently working						
No = 0, Yes = 1	2.862	1.356	.035	17.502	1.228	249.480
HIV test status						

Table 18: *Binary Logistic Regression Model 1 for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117)*

Independent Variable	B	S.E.	p-value	OR	95% C.I.for EXP(B) Lower	Upper
No = 0, Yes = 1	1.777	.891	.046	5.913	1.032	33.887
PrEP use						
No = 0, Yes = 1	-.253	.996	.799	.776	.110	5.465
Aware of U=U						
No = 0, Yes = 1	2.560	1.159	.027	12.930	1.335	125.249
Constant	-5.163	1.740	.003	.006		
Percent correctly predicted	83.8		<0.001			

Note. AI – American Indian; AA – Asian American; NA – Native American; NH – Native Hawaiian; OPI – Other Pacific Islander. PrEP – pre-exposure prophylactic; U =U – undetectable equals untransmittable.

Table 19: *Final Binary Logistic Regression Model (6) for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117)*

	B	S.E.	p-value	OR	95% C.I.for EXP(B) Lower	Upper
Marital Status						
Single	Referent					
Married	-1.403	1.186	.237	.246	.024	2.513
Widowed or separated	.501	1.280	.696	1.650	.134	20.285
Divorced	1.024	1.183	.387	2.784	.274	28.267
Other- cohabitating, civil union, common law	1.735	1.110	.118	5.666	.644	49.892
Sexual Orientation						
Heterosexual						
Homosexual or lesbian	-2.922	1.676	.081	.054	.002	1.438
Bisexual	-1.955	1.163	.093	.142	.014	1.382
All other	-17.922	27841.597	.999	.000	.000	.
Currently working						
No = 0, Yes = 1	.540	.849	.525	1.716	.325	9.070
HIV test status						
No = 0, Yes = 1	1.846	.890	.038	6.336	1.108	36.241
Aware of U=U						
No = 0, Yes = 1	.500	.900	.579	1.648	.282	9.626
Depression screen score						
Negative = 0, Positive = 1	.207	.773	.789	1.230	.270	5.593
Risk perception with U equals U						
Risk = 0, No risk = 1	3.606	1.273	.005	36.836	3.037	446.773
Attitude to HIV RX as prevention						
Disagree = 0, Agree = 1	2.051	.975	.036	7.772	1.149	52.571
Community trust in U equals U						
Disagree = 0, Agree = 1	1.599	.774	.039	4.949	1.087	22.540
People in neighborhood can be trusted						

Table 19: *Final Binary Logistic Regression Model (6) for Belief in the Accuracy of U equals U (Outcome #1) Among Racial/Ethnic Minority Women (N = 117)*

					95% C.I.for EXP(B)	
	B	S.E.	p-value	OR	Lower	Upper
Disagree = 0, Agree = 1	1.699	.933	.069	5.467	.877	34.057
Constant	-4.509	1.234	.000	.011		
Percent Correctly Predicted	89.7		<0.001			

Note. RX – treatment; U =U – undetectable equals untransmittable.

Table 20: *Bivariate Associations between Perceptions of Risk of Transmission with U Equals U and Demographic Characteristics*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		**Risk Present**		**No Risk Present**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value
Perceptions of risk of HIV transmission with U equals U	134						
Risk present		90 (67.2)					
No risk present		44 (32.8)					
Race/Ethnicity	134						Chi-Square p <0.001
Hispanic		68 (50.7)	58	85.3	10	14.7	
Black/African American		49 (36.6)	16	32.7	33	67.3	
Other (AA, NH, OPI, NA/AI, Bi and Multiracial		17 (6.7)	16	94.1	1	5.9	
Age (*Years*)	134	35.0 (28.8, 41.0)	90		44		Mann-Whitney U p = 0.021
Marital Status	133						Likelihood Ratio p <0.001
Single		43 (32.3)	37	86.0	6	14.0	
Married		50 (37.6)	22	44.0	28	56.0	
Widowed/Separated		10 (7.6)	10	100.0	0	0.0	
Divorce		16 (12.0)	8	50.0	8	50.0	
Other (Cohabitating, Common law, Civil union		14 (10.4)	12	85.7	2	14.3	

Table 20: *Bivariate Associations between Perceptions of Risk of Transmission with U Equals U and Demographic Characteristics*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		**Risk Present**		**No Risk Present**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value
Education Completed	133						Likelihood Ratio p = 0.023
Master's Degree		5 (3.7)	3	60.0	2	40.0	
Bachelor's Degree		36 (27.1)	17	47.2	19	52.8	
Associates Degree		22 (16.5)	18	81.8	4	18.2	
Vocational Training After High School		31 (23.3)	19	61.3	12	38.7	
High School		31 (23.3)	25	80.6	6	19.4	
Elementary/Middle School		3 (2.3)	3	100.0	0	0.0	
No Formal Education		5 (3.8)	4	80.0	1	20.0	
Religion	133						Likelihood Ratio p = 0.007
Christian		112 (84.2)	71	63.4	41	36.6	
Other (Islam, Catholic)		10 (7.5)	10	100	0	0.0	
None		11 (8.3)	9	81.8	2	18.2	
Sexual Orientation	133						Likelihood Ratio p = 0.036
Heterosexual (Straight)		107 (80.5)	66	61.7	41	38.3	
Homosexual (Lesbian)		11 (8.3)	10	90.9	1	9.1	
Bisexual		13 (9.8)	11	84.6	2	15.4	

Table 20: *Bivariate Associations between Perceptions of Risk of Transmission with U Equals U and Demographic Characteristics*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		**Risk Present**		**No Risk Present**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value
Other/None		2 (1.5)	2	100.0	0	0.0	
Currently Working	130						Chi-Square p <0.001
Yes		95 (73.1)	55	57.9	40	42.1	
No		35 (26.9)	33	94.3	2	5.7	
Employment Status	113						Likelihood Ratio p = 0.018
Full time		84 (74.3)	46	54.8	38	45.2	
Part-time		9 (8.0)	7	77.8	2	22.2	
N/A		20 (17.7)	17	85.0	3	15.0	
Annual Income (*Dollars*)	118	35,500 (17,000, 50,000)	76		42		Mann Whitney U p <0.001
Birth Country	131						Chi-Square p = 0.007
United States		113 (86.3)	70	61.9	43	38.1	
Outside United States		18 (13.7)	17	94.4	1	5.6	
United States Residence (*Years*)	18	19.6 (14.1)	17	18.4 (13.55)	1	40.0 (-)	*t*-test p = 0.141

Table 20: *Bivariate Associations between Perceptions of Risk of Transmission with U Equals U and Demographic Characteristics*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		Risk Present		No Risk Present		Test and p-value
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value

Note. AI – American Indian; AA – Asian American; NA – Native American; NH – Native Hawaiian; OPI – Other Pacific Islander. Some variables have a different N because of missing data. Non-significant (i.e., $p \geq 0.05$) and conditional variables such as employment status and income were not included in the regression analysis.

Table 21: *Statistically Significant Bivariate Associations with Perceptions of Risk of HIV Transmission with U Equals U and Health-related Variables*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		Risk Present		No Risk Present		Test and p-value
Characteristics	**N**	**Freq (%)**	**N**	**%**	**N**	**%**	
Perceptions of risk of HIV transmission with U equals U	134						
Risk present		90 (67.2					
No risk present		44 (32.8)					
Anxiety screen	133						Chi-Square p <0.001
Positive		62 (46.6)	32	51.6	30	48.4	
Negative		71 (53.4)	57	80.3	14	19.7	
Depression screen	134						Chi-Square p <0.001
Positive		57 (42.5)	27	47.4	30	52.6	
Negative		77 (57.5)	63	81.8	14	18.2	
HIV Risk-Taking Behavior	134	6.0 (0.0, 10.0)	90		44		Mann-Whitney U p = 0.021
Alcohol use screen	134						Chi-Square p <0.001
Positive SUD		72 (53.7)	37	51.4	35	48.6	
Positive problem use		29 (21.6)	25	86.2	4	13.8	
Negative		33 (24.6)	28	84.8	5	15.2	
Time spent on social media	130						Likelihood Ratio p <0.001
>3 hours		8 (6.2)	8	100.0	0	0.0	
2-3 hours		30 (23.1)	10	33.3	20	66.7	
1-2 hours		45 (34.6)	32	71.1	13	28.9	
30-60 minutes		26 (20.0)	18	69.2	8	30.8	

<30 minutes		21 (16.2)	18	85.7	3	14.3	
Social media impact on attitude	130						Likelihood Ratio p = 0.034
Very high impact		8 (6.2)	4	50.0	5	50.0	
High impact		32 (24.6)	16	50.0	16	50.0	
Some impact		53 (40.8)	35	66.0	18	34.0	
Minimal impact		15 (11.5)	13	86.7	2	13.3	
No impact		22 (16.9)	18	81.8	4	18.2	

Note. SUD – substance use disorder. Some variables have a different N because of missing data. Some variables have a different N because of missing data. Non-significant (i.e., $p \geq 0.05$) and conditional variables such as time spent on social media were not included in the regression analysis.

Table 22*: Statistically Significant Bivariate Associations with Perceptions of Risk of HIV transmission with U Equals U and Individual Attitudes*

			Perceptions of risk of HIV transmission with U equals U				
	Overall		Risk Present		No Risk Present		Test and p-value
Characteristic	N	Freq (%) Median (Q1, Q3)	N	(%)	N	(%)	
Perceptions of risk of HIV transmission with U equals U	134						
Risk present		90 (67.2)					
No risk present		44 (32.8)					
Attitude toward PLWHA	134	25.5 (14.0, 35.0)	90		44		Mann Whitney U p <0.001
Attitude toward HIV RX is Necessary	134						Chi-Square p <0.001
Positive		108 (80.6)	65	60.2	43	39.8	
Negative		26 (19.4)	25	96.2	1	3.8	
Attitude to U Equals U							
Beliefs in accuracy of U equals U	134						Chi-Square p <0.001
Completely accurate		64 (47.0)	23	36.5	40	63.5	
Not accurate		71 (53.0)	67	94.4	4	5.6	

Note. PLWHA – people living with HIV/AIDS, RX – treatment, U equals U – undetectable equals untransmittable. Statistically significant = p<0.05. Some variables have a different N because of missing data.

Table 23: *Statistically Significant Bivariate Associations between Perceptions of Risk of HIV transmission with U Equals U and Organization, Community and Neighborhood Factors*

			Perceptions of Risk of HIV transmission with U Equals U				
	Overall		**Risk Present**		**No Risk Present**		**Test and p-value**
Characteristic	N	Freq (%)	N	(%)	N	(%)	
Perceptions of risk HIV transmission w/ U equals U	134						
Risk present		90 (67.2)					
No risk present		44 (32.8)					
Organization							Chi-Square p = 0.017
Have PCP	126						
Yes		99 (78.6)	60	60.6	39	39.4	
No		27 (21.4)	23	85.2	4	14.8	
Satisfaction with PCP	115						Chi-Square p = 0.006
Satisfied		86 (74.8)	50	58.1	36	41.9	
Not satisfied		29 (25.2)	25	86.2	4	13.8	
Commute to PCP	110						Chi-Square p <0.001
60 minutes+		20 (18.2)	14	70.0	6	30.0	
30-59 minutes		55 (50.0)	25	45.5	30	54.5	
<30 minutes		35 (31.8)	31	88.6	4	11.4	

Community Attitudes toward PLHIV							
Most people would not buy vegetables	129						Chi-Square p = 0.003
Agree		82 (63.6)	47	57.3	35	42.7	
Disagree		47 (36.4)	39	83.0	8	17.0	
Most people think HIV RX is effective	132						Chi-Square p <0.001
Agree		76 (57.6)	36	47.4	40	52.6	
Disagree		56 (42.4)	53	94.6	3	5.4	
Most people will trust U equals U	131						Chi-Square p <0.001
Agree		61 (46.6)	26	42.6	35	57.4	
Disagree		70 (53.4)	62	88.6	8	11.4	
Neighborhood Characteristics							
People can be trusted	129						Chi-Square p <0.001
Agree		71 (55.0)	35	49.3	36	50.7	
Disagree		58 (45.0)	53	91.4	5	8.6	
People afraid to go out	129						Chi-Square p = 0.006
Agree		19 (14.7)	18	94.7	1	5.3	
Disagree		110 (85.3)	69	62.7	41	37.3	
Gang is issue	130						Chi-Square p = 0.003
Agree		21 (16.2)	20	95.2	1	4.8	
Disagree		109 (83.8)	68	62.4	41	37.6	

Public transport accessible	127						Chi-Square p = 0.021
Agree		81 (63.8)	49	60.5	32	39.5	
Disagree		46 (36.2)	37	80.4	9	19.6	

Note. PCP – primary care provider; PLHIV – people living with HIV; RX – treatment. Some variables have a different N because of missing data. Statistically significant = $p<0.05$. Some variables have a different N because of missing data. Conditional variables such as satisfaction with PCP and commute to PCP were not included in the regression analysis.

Table 24: *Binary Logistic Regression Model 1 for Perceptions of Risk of HIV Transmission with U equals U (Outcome #2) Among Racial/Ethnic Minority Women (N = 115)*

					95% C.I.for EXP(B)	
	B	S.E.	p-value	OR	Lower	Upper
Race/ethnicity						
Hispanic	Referent					
Black or African American	1.914	.975	.050	6.782	1.004	45.829
Other race/ethnicities - AA, NA/AI, PI, Bi and Multiracial	-22.077	7156.748	.998	.000	.000	.
Age (*Years*)	.200	.080	.013	1.222	1.044	1.431
Marital Status						
Single	Referent					
Married	-2.616	1.659	.115	.073	.003	1.887
Widowed or separated	-20.410	9775.286	.998	.000	.000	.
Divorced	-1.883	1.819	.301	.152	.004	5.379
Other- cohabitating, civil union, common law	-1.724	1.783	.334	.178	.005	5.877
Education						
Bachelor's Degree of higher	Referent					
Associates degree	-1.298	1.026	.206	.273	.037	2.039
Vocational training	-.315	.971	.745	.730	.109	4.891
High school completion	-2.384	1.262	.059	.092	.008	1.094
Elementary or no education	-13.160	16647.084	.999	.000	.000	.
Religion						
Christianity						
Other religions	-19.864	11716.697	.999	.000	.000	.
No religion	3.651	2.250	.105	38.504	.468	3166.114

Table 24: *Binary Logistic Regression Model 1 for Perceptions of Risk of HIV Transmission with U equals U (Outcome #2) Among Racial/Ethnic Minority Women (N = 115)*

					95% C.I.for EXP(B)	
	B	S.E.	p-value	OR	Lower	Upper
Sexual Orientation						
Heterosexual						
Homosexual or lesbian	-2.661	1.613	.099	.070	.003	1.651
Bisexual	-.104	1.312	.937	.901	.069	11.803
All other – none	-12.999	23194.916	1.000	.000	.000	.
Currently working						
No = 0, Yes = 1	.415	1.618	.798	1.515	.064	36.090
Country of birth						
No = 0, Yes = 1	.025	1.593	.987	1.025	.045	23.249
HIV test status						
No = 0, Yes = 1	-.156	.904	.863	.855	.146	5.028
PrEP use						
No = 0, Yes = 1	1.675	.966	.083	5.339	.804	35.460
Aware of U=U						
No = 0, Yes = 1	5.206	2.231	.020	182.340	2.303	14437.776
Constant	-10.959	3.461	.002	.000		
Percent correctly predicted	87.0			<0.001		

Note. AI – American Indian; AA – Asian American; NA – Native American; NH – Native Hawaiian; OPI – Other Pacific Islander. PrEP – pre-exposure prophylactic; U =U – undetectable equals untransmittable.

Table 25: *Final Regression Model (6) for Perception of No Transmission Risk with U equals U (Outcome #2) Among Racial/Ethnic Minority Women (N = 125)*

Independent Factors	B	S.E.	p-value.	OR	95% C.I.for EXP(B) Lower	Upper
Age (*Years*)	-0.012	0.070	0.862	0.988	0.862	1.132
Aware of U=U						
No = 0, Yes = 1	2.372	2.552	0.353	10.715	0.072	1594.610
Alcohol use screen						
SUD	Referent		0.004			
Negative	-1.676	1.752	0.339	0.187	0.006	5.806
Problem use	-3.779	1.130	0.001	0.023	0.002	0.209
Attitude toward PLWHA Score	-0.062	0.055	0.256	0.940	0.845	1.046
Attitude to HIV RX is necessary	21.410	6057.872	0.997	1987583271.097	0.000	
Disagree = 0, Agree = 1						
Attitude to accuracy of U equals U						
Not accurate = 0, Completely accurate = 1	5.488	1.334	0.000	241.780	17.697	3303.317
Cultural attitudes to HIV Rx is effective						
Disagree = 0, Agree = 1	5.284	1.754	0.003	197.091	6.332	6135.044
People in neighborhood can be trusted						
Disagree = 0, Agree = 1	-0.146	1.250	0.907	0.864	0.075	10.014
Constant	-28.818	6057.874	0.996	0.000		
Percent correctly predicted	92.8		<0.001			

Note: PLWHA – people living with HIV/AIDS; RX – treatment; SUD – substance use disorder; U=U – undetectable equals untransmittable.

Table 26: *Significant Bivariate Associations with Likelihood of Having Condomless Sex with U Equals U Among Minority Women*

			Likelihood of Condomless Sex with U equals U				
	Overall		**Unlikely**		**Likely**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value
Condomless Sex with U equals U	134						
Unlikely		111 (82.8)					
Likely		23 (17.2)					
Demographics							
Education Completed	133						Chi-Square p = 0.011
Bachelor's Degree and higher		41 (30.8)	39	95.1	2	4.9	
Less than Bachelor's Degree		92 (69.2)	71	77.2	21	22.8	
Employment Status	113						Likelihood Ratio p = 0.020
Full-time		84 (74.3)	73	86.9	11	13.1	
Part-time		9 (8.0)	4	44.4	5	55.6	
N/A		20 (17.7)	17	85.0	3	15.0	
HIV Status	134						Fisher's Exact p <0.001
Yes		4 (3.0)	0	0.0	4	100.0	
No		130 (97.0)	111	85.4	19	14.6	

Table 26: *Significant Bivariate Associations with Likelihood of Having Condomless Sex with U Equals U Among Minority Women*

			Likelihood of Condomless Sex with U equals U				
	Overall		**Unlikely**		**Likely**		**Test and p-value**
Characteristic	N	Freq (%) Mean (SD) Median (Q1, Q3)	N	% Mean (SD)	N	% Mean (SD)	Test and p-value
Attitudes							
Attitude toward PLWHA	134	25.5 (14.0, 35.0)	111		23		Mann Whitney U p = 0.021
Attitude toward HIV RX as Prevention	134						Fisher's Exact p = 0.047
Positive		29 (21.6)	20	69.0	9	31.0	
Negative		105 (78.4)	91	86.7	14	13.3	
Neighborhood							
People generally get along in neighborhood	130						Chi-Square p = 0.008
Agree		69 (53.1)	63	91.3	6	8.7	
Disagree		61 (46.9)	45	73.8	16	26.2	

Note. PLWHA – people living with HIV/AIDS, RX – treatment, U equals U – undetectable equals untransmittable. Some variables have a different N because of missing data. Non-Significant (i.e., p >0.05) and conditional variables such as employment status were not included in the regression analysis.

Table 27: Final Regression Model (6) for Likelihood of Engaging in Condomless Sex with U equals U (Outcome #3) Among Minority Women (N = 129)

Independent Factors	B	S.E.	p-value	OR	95% C.I. for EXP(B) Lower	Upper
Education						
Bachelor's Degree or Higher	Referent					
Associates degree	0.617	0.965	0.523	1.853	0.280	12.289
Vocational training	1.143	0.899	0.203	3.137	0.539	18.265
High school completion	1.245	0.929	0.180	3.473	0.563	21.443
Elementary or no education	1.710	1.098	0.120	5.527	0.642	47.576
Attitude						
Attitude toward PLWHA Score	-0.061	0.033	0.066	0.941	0.881	1.004
Attitude to HIV RX as prevention (Negative = 0, Positive = 1)	1.979	0.667	0.003	7.237	1.960	26.722
Neighborhood						
People generally get along (Disagree = 0, Agree = 1)	-1.582	0.606	0.009	0.205	0.063	0.674
Constant	-0.987	1.067	0.355	0.373		
Percent correctly predicted	83.7		<0.001			

Note: PLWHA – people living with HIV/AIDS, RX – treatment, U equals U – undetectable equals untransmittable.

Figures

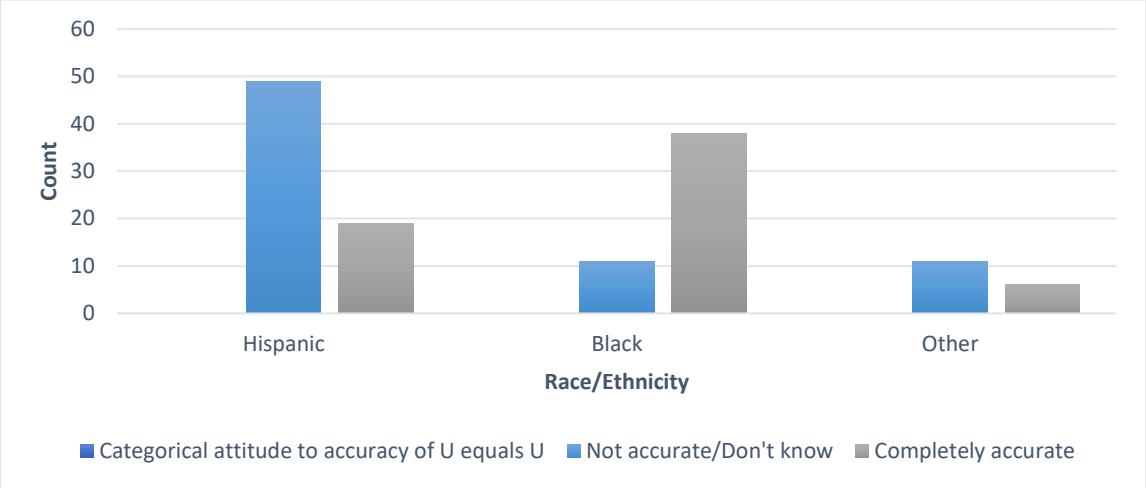

Figure 2: Beliefs about U equals U accuracy by race/ethnicity.

Note. Bivariate analysis appeared to show a difference in beliefs in the accuracy of U equals U among those of Black/African American race/ethnicity compared to Hispanics and others (Chi-Square p <0.001).

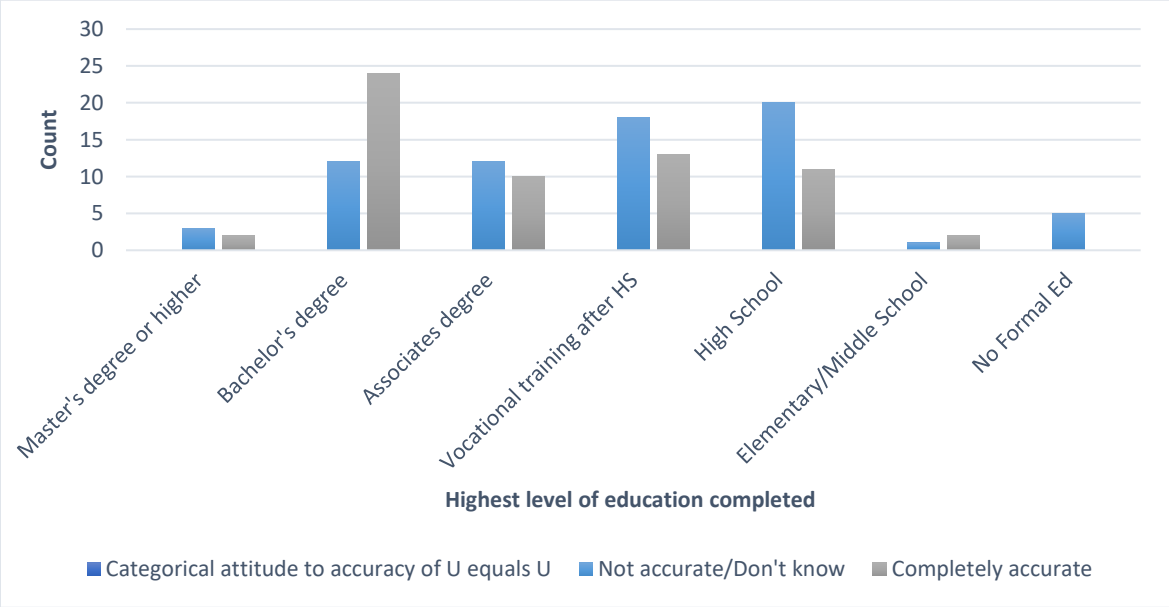

Figure 3: Beliefs about U equals U accuracy by the highest level of education completed.

Note. Bivariate analysis appeared to have a difference in beliefs in the accuracy of U equals U among those with higher education (Likelihood Ratio p = 0.0024).

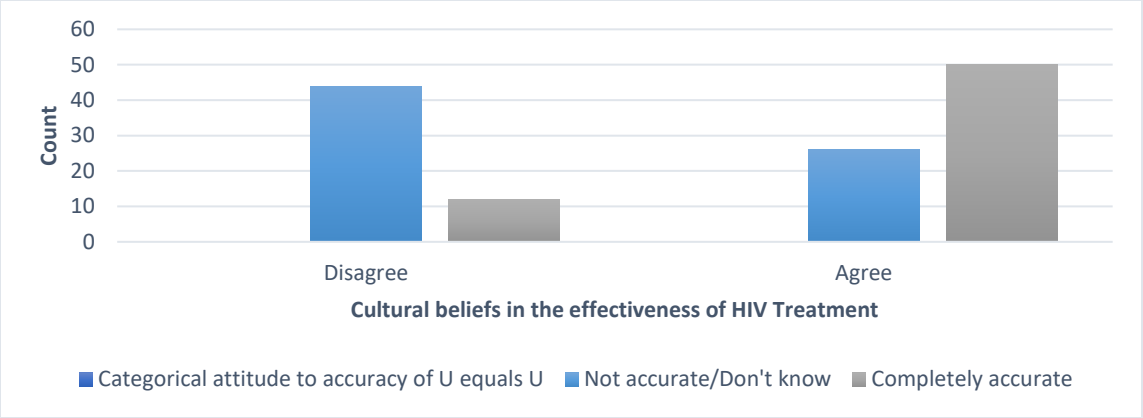

Figure 4: Beliefs in the accuracy of U equals U by cultural beliefs in the effectiveness of HIV treatment.

Note. Bivariate association was statistically significant in beliefs in accuracy of U equals U among those who agreed that people from their cultural background would believe in the efficacy of HIV treatment compared to those who disagreed (Chi-Square p <0.001).

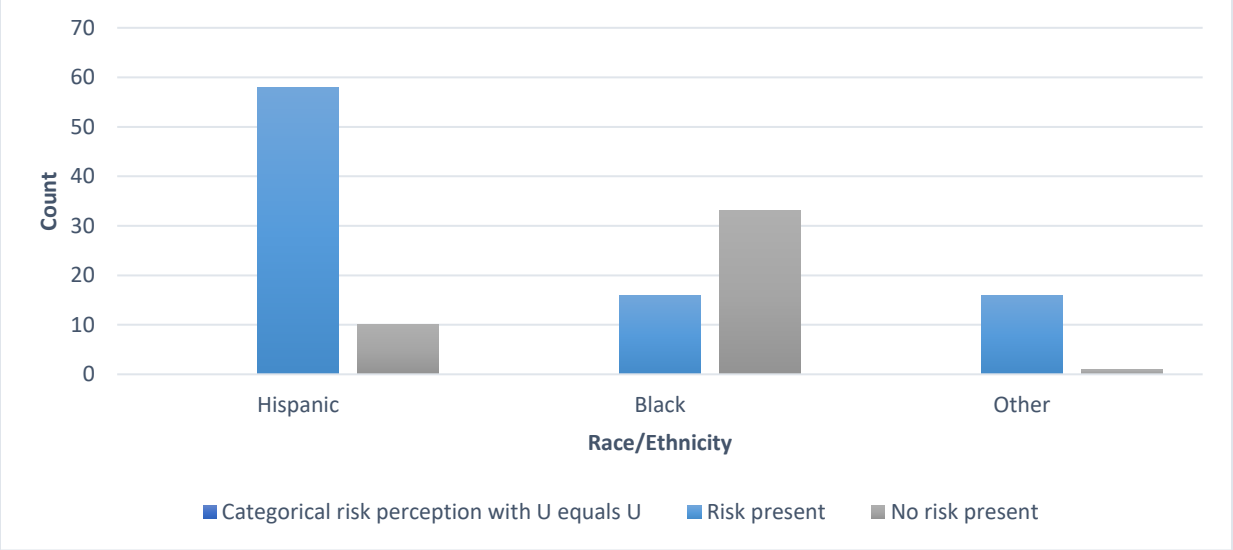

Figure 5: Perception of risk of transmission by race/ethnicity.

Note. Bivariate analysis appeared to show a difference in perception of risk of HIV transmission with U equals U among those of Black race/ethnicity compared to others (Chi-Square p <0.001).

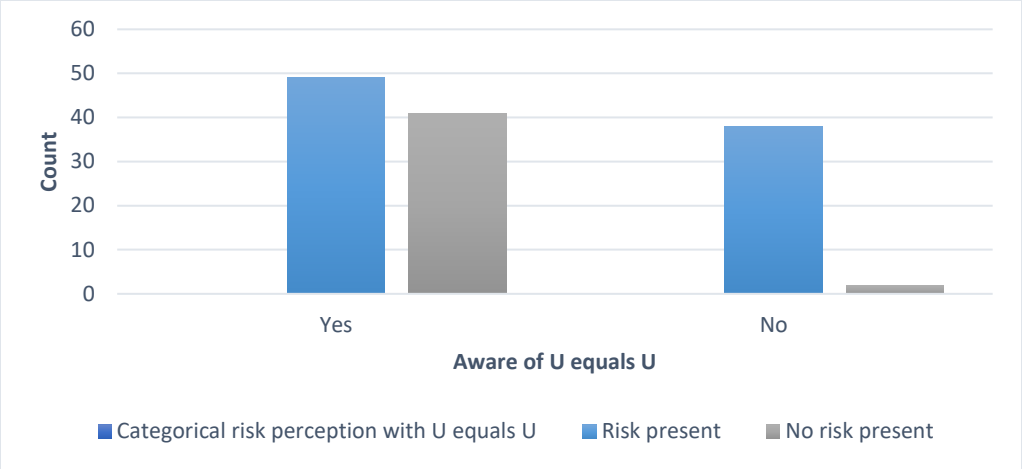

Figure 6: Perceptions of risk of HIV transmission with U equals U by awareness of U equals U

Note. Bivariate analysis appeared to show a difference in perceptions of risk of HIV transmission with U equals U among those who were aware of U equals U compared to those who were not (Chi-Square p <0.001).

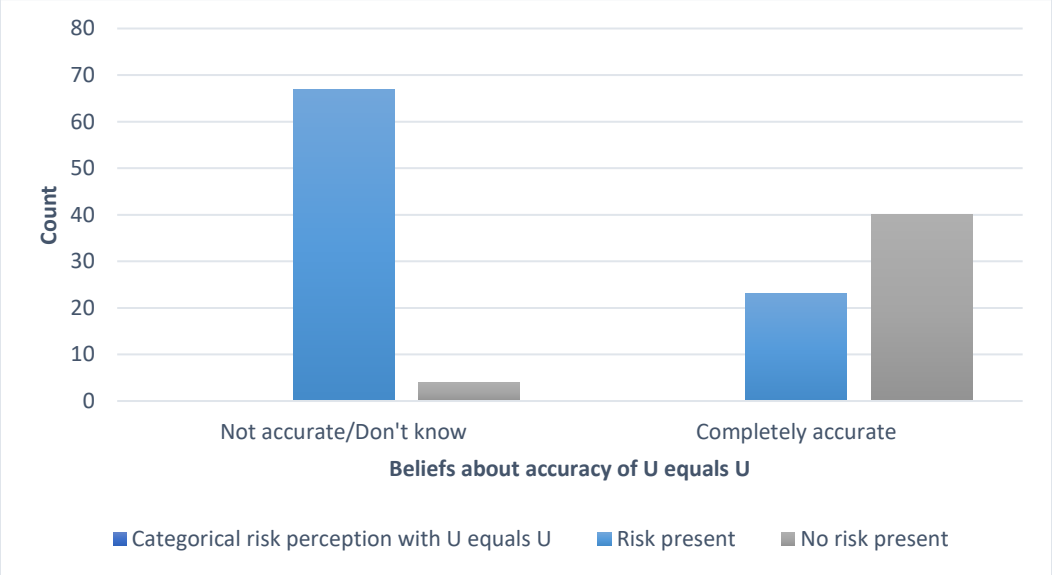

Figure 7: Perceptions of risk of HIV transmission by beliefs about the accuracy of U equals U. Bivariate analysis revealed a statistically significant difference in perceptions of risk of HIV transmission with beliefs in the accuracy of U equals U concept (Chi-Square p <0.001).

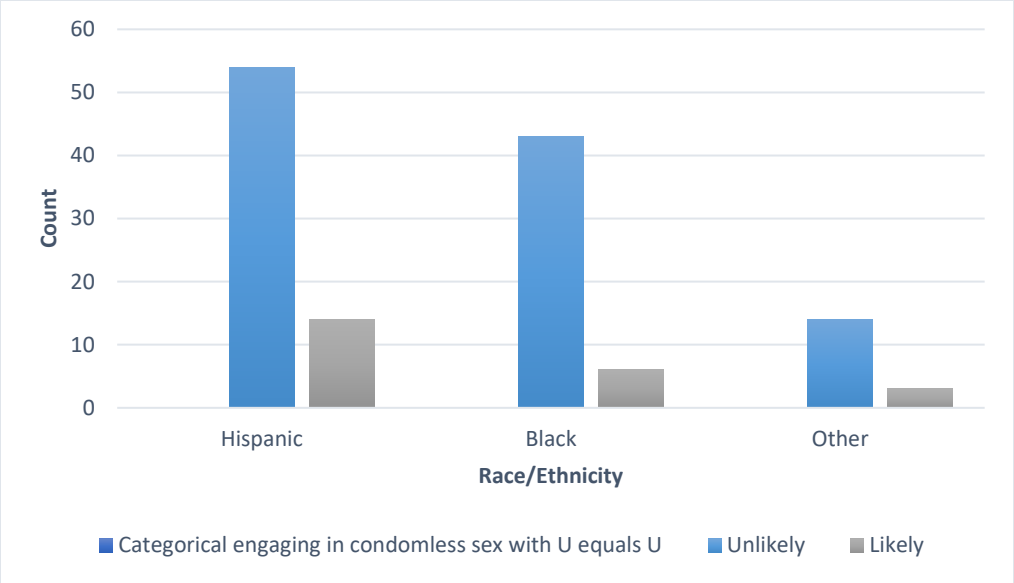

Figure 8: Likelihood of condomless sex with U equals U by race/ethnicity.

Note. Bivariate analysis appeared to have no difference in the likelihood of having condomless sex with U equals U by race/ethnicity (Likelihood ratio p = 0.207).

APPENDICES

Appendix A

Percentages of advanced disease state at HIV diagnosis among women by race in the United States from 1985-2017.

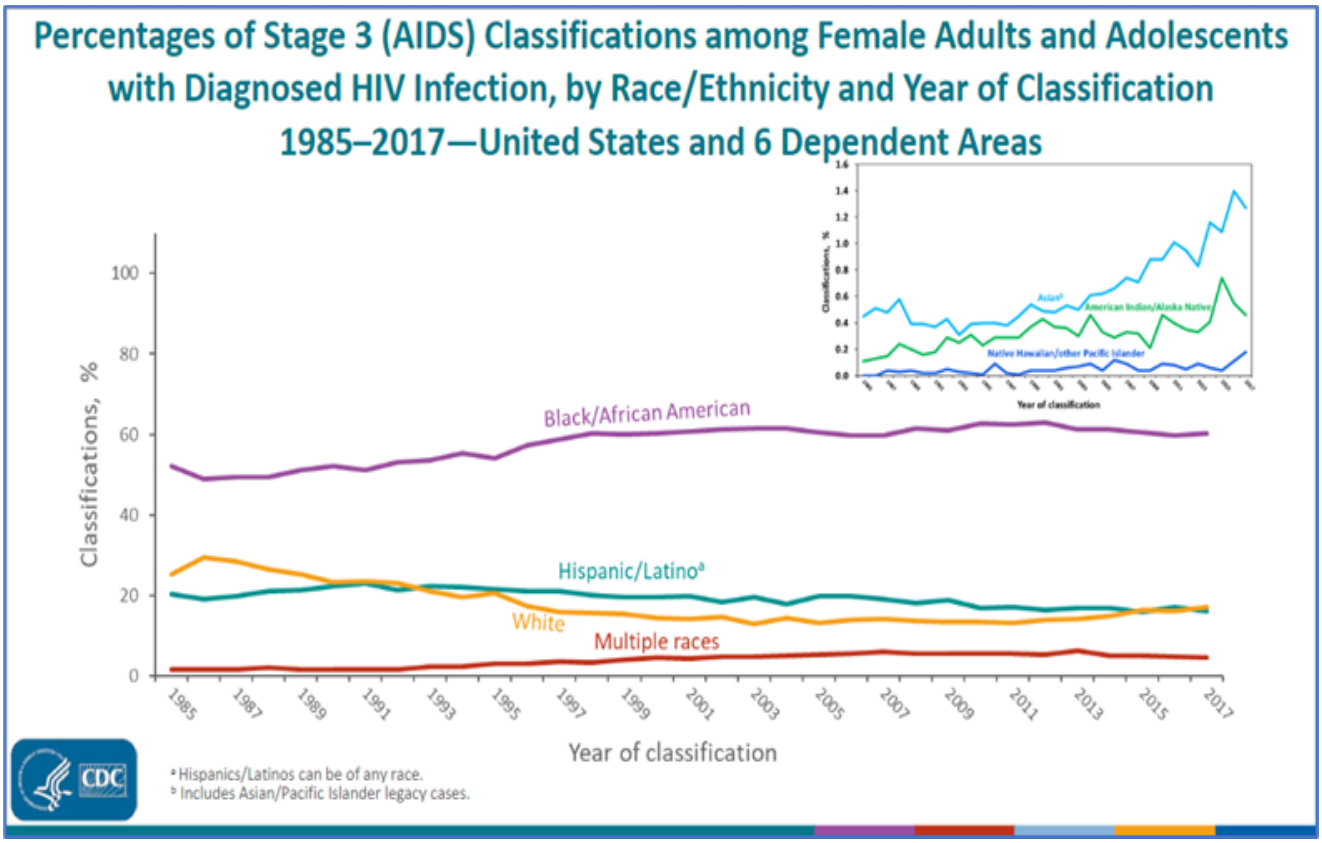

Figure 9: Percentages of Stage 3 (AIDS) Classifications among Female Adults and Adolescents with Diagnosed HIV Infection by Race/Ethnicity and Year of Classification 1985–2017—United States and 6 Dependent Areas.

Adapted from *HIV Surveillance in Women 2018 (preliminary)*, by Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Division of HIV/AIDS Prevention, September 24, 2020, retrieved from https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-surveillance-women-2018.pdf Copyright 2018 by Centers for Disease Control and Prevention.

Appendix B

Study Conceptual Model

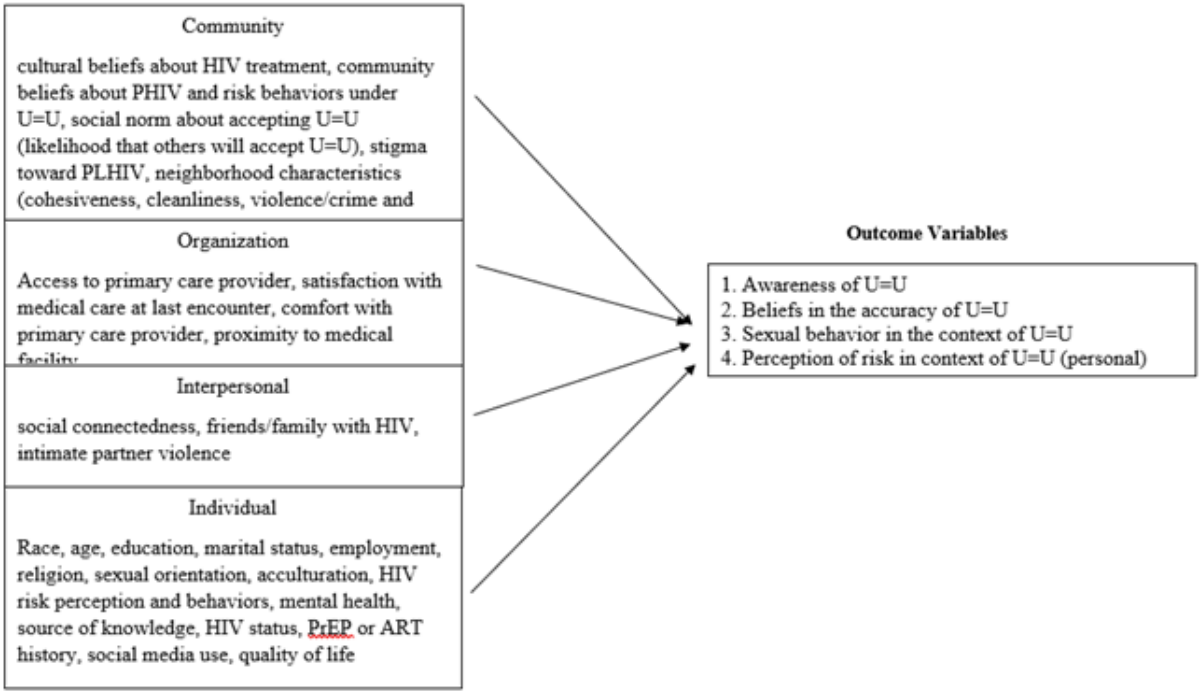

Figure 10: Conceptual model of U=U research

Exploring the relationship of socioecological factors on the acceptance of U=U and the perception of risk of HIV infection among adult minorities in the El Paso, TX, US - Juarez, Mexico border region.

Appendix C

Theoretical Framework of Study

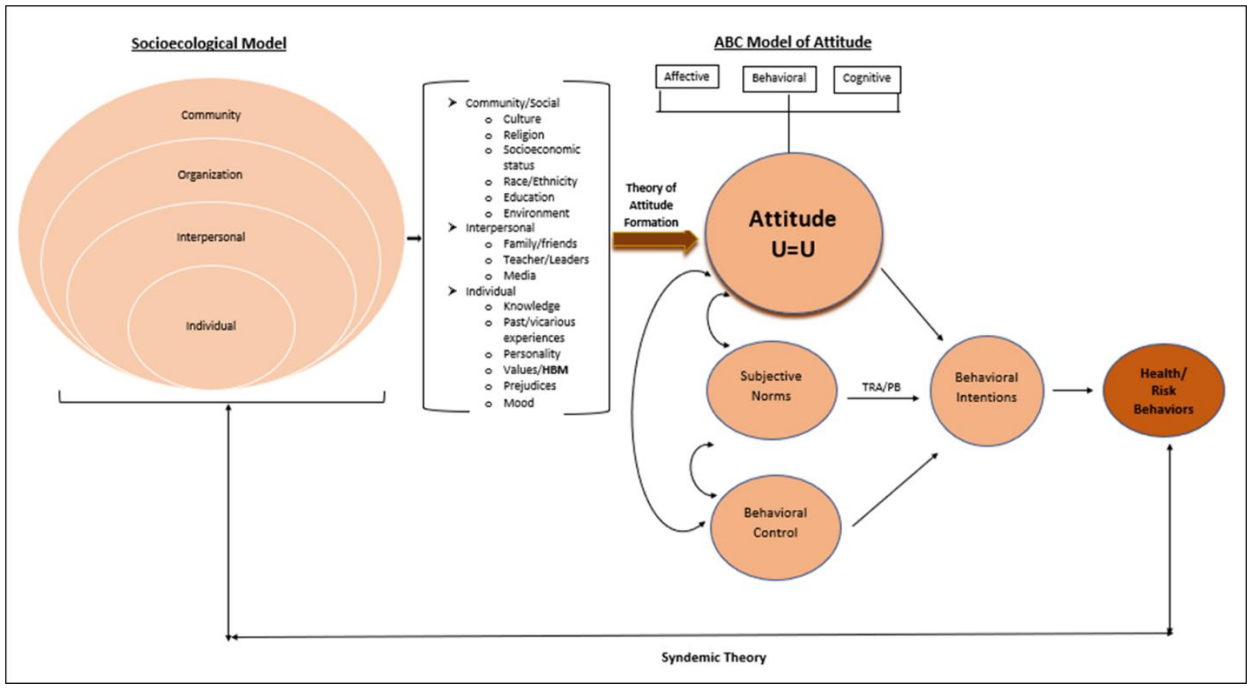

Figure 11: Theoretical Framework of Study

The theoretical framework includes the ABC Model of Attitude (Breckler, 1984), Syndemic Theory (Batchelder et al., 2015), Theory of Attitude Formation (Bakanauskas et al., 2020), Theories of Reasoned Action and Planned Behavior(Ajzen & Fishbein, 2005).

Appendix D

Implications of U=U message

Table 28*: Implications of U=U*

Study Reference	Implications Discussed
Lambert-Niclot et al., (2012)	Possible transmission due to HIV-1 RNA in seminal plasma samples from patients with undetectable viral load
Guerrero (2017)	Improvement in mental health, reproductive and sexual health and stigma
Eisinger, Dieffenbach, & Fauci (2019)	Criminalization of HIV, stigma reduction and increased self-esteem, better treatment/health outcomes
Gosbell, Hoad, Styles, Lee, & Seed (2019)	Undetectable viral load can cause unwanted HIV transmission in blood transfusion
Ashford, Morris, & Powell (2020)	Rethinking the harms of HIV transmission and criminalization of PLHIV in the era of U=U
Bavinton & Rodger(2020)	TasP is effective at individual level but cannot succeed at the population level to control/end the HIV epidemic alone; Universal test & treat RCTs not as effective as hoped

Table 28*: Implications of U=U*

Study Reference	Implications Discussed
Bhatt & Douglas,(2020)	HIV serodiscordant couples could get pre-conception counselling by regular providers in the context of U=U and optimal fertility periods eliminating the need for costly and automatic referrals to reproductive endocrinology and infertility specialist.
Patel, Curoe, & Chan (2020)	The U=U can contribute to the achieving the "Ending the HIV Epidemic: A Plan for America," which seeks to reduce new HIV infections to <3000 per year by 2030 in the U.S.
Rendina, Talan, Cienfuegos-Szalay, Carter, & Shalhav (2020)	Multifaceted benefits of U=U with improved personal health, sexual safety and intimacy, increased self-image, and reduced social stigma, exceeding the medical and prevention benefits of treatment.
Thomford, Mhandire, Dandara, & Kyei (2020)	Policy-makers, clinicians, health service providers, and HIV control programs can have a profound impact on the HIV epidemic in South Africa if the benefits of U=U are promoted effectively. Clinical practices in SSA can have a great impact.

HIV – Human Immunodeficiency Virus; PLHIV – people living with HIV; RCT – randomized controlled trial; RNA – ribonucleic acid; TasP – treatment as prevention; U=U – undetectable equals untransmittable.

Appendix E

Survey Instruments for Qualitative and Quantitative Data Collection

Semi-structured Questions for Qualitative Data Collection

Minority Women's Attitudes and Beliefs Toward Undetectable Equals Untransmittable in the El Paso, TX, US - Juarez, Mexico border region

INTRODUCTION

Thank you for participating in this study. This interview consists of two parts. First, a self-administered standardized demographics survey. The second part is an interview that will be recorded and later transcribed for further in-depth analysis.

Please read each of the following questions and statements and write or choose the answer(s) that best describes your position.

PART I - Demographic questionnaire

1. What is your race/ethnicity? (Select all that apply)
_____ White
_____ African American
_____ Hispanic/Latino
_____ Asian American, native Hawaiian or other Pacific Islanders
_____ Native American/American Indian
_____ Bi-racial
_____ Multiracial
_____ Others (please specify): _____

2. How old are you? _____ years

3. How many children do you have? _____

4. Are you employed? ____Yes ____ No

5. What best describes your employment?
_____Part time _____ Full time _____ Self-employed _____ N/A

6. What is the highest level of education/formal training you completed?
_____ Master's degree and higher
_____ Bachelor's degree
_____ Associate degree
_____ Vocational training after high school
_____ High School
_____ Elementary/Middle School

_____ No formal education

7. What is your country of birth? _____

8. How long have you been in the U.S.? _____ years

9. Has a doctor ever diagnosed you with a mental health condition?
_____ Yes _____ No **IF YES,** specify the diagnosis**:** _____

10. Has a doctor ever diagnosed you with HIV? _____ Yes _____ No

11. Have you ever taken Pre-exposure prophylaxis (PrEP)? _____ Yes _____ No

12. In the last month, have you experienced intimate partner violence (slapped, kicked, punched etc..) by an individual whom you are in a romantic relationship with? _____ Yes _____ No

13. Do you know someone personally who has HIV/AIDS? ____Yes ____ No

14. Do you know someone personally who has died of AIDS? ____Yes ____ No

PART II – Interview

Interview Date:
Time Start:
Time End:
Location:
Participant ID#:

Thank you for completing the first part of this study. Welcome to the second part which is an in-depth interview. I would like to remind you that you will be recorded in this session for purposes of transcribing and thematic analysis. Kindly state for the record whether you give your consent to participate in this interview and also whether you agree to be recorded.

1. Please Share: a) what you think about people living with HIV/AIDS (PLWHA)?
b) What you believe about people living with HIV/AIDS (PLWHA)?
c) What you feel about people living with HIV/AIDS (PLWHA)?
(Probe knowledge, beliefs, experience, network perceptions related to HIV/AIDS)

2. a) What are your beliefs about HIV treatment on the health of PLHIV/WLHIV?
b) What are your beliefs about HIV treatment impact on the health of PLHIV/WLHIV?

3. What do you believe about your own risk of HIV? (Alcohol use, illegal and prescription drug use, sexual risks etc.…)

4. Have you have heard about undetectable equals untransmittable before? Please share what you know about it. (Probe knowledge, communication with health professionals, network norms, health beliefs, behaviors related to U-U)

5. Do you believe that someone who has an undetectable viral load cannot transmit the virus to someone else through sexual contact? i.e., effectively no risk of transmission if the HIV+ individual has an undetectable viral load. (Probe perceptions related to beliefs expressed)

6. How do you think an undetectable viral load may impact the behaviors and experiences of PLHIV?

7. a) In general, do you think people in your family or community may believe in the accuracy of U=U?
b) Why or why not?
c) How do you think they feel toward PLHIV who have an undetectable viral load?

8. Why do you think some people in your community may accept or believe in the concept of U=U while others might not?

9. How should the U=U message be promoted among community members in the El Paso region. What are some of the issues that may prevent spreading and the uptake of these U-U related health messages?

CONCLUSION

Thank you for your participation in this interview. Is there any other information you would like to share about U=U and or ART treatment as prevention?

Social ecological factors and their relationship to attitudes toward U=U Survey

Instructions: Please choose the best response that most accurately describes your characteristics, awareness/knowledge, attitudes and beliefs by placing a check mark (√) in the appropriate box for each question in the survey or providing a written response where needed.

PART 1 – INDIVIDUAL FACTORS

Section 1 - Individual Demographics		
Instructions: The following questions ask about your demographics. Please choose the best response that most accurately describes your characteristics, by placing a check mark (√) or appropriate response in the corresponding box for each question.		
1	What is your race/ethnicity?	□ White, Non-Hispanic □ Black/African American □ Hispanic/Latino □ Asian American, native Hawaiian or other Pacific Islanders □ Native American/American Indian □ Bi-racial □ Multiracial Others (please specify): ___ _____
2	What is your age in years?	_____ years
3	What is your marital status?	□ Single □ Married □ Widowed □ Separated □ Divorced □ Cohabitating □Common Law □ Civil union
4	What is the highest level of education you have completed?	□ Master's degree and higher □ Bachelor's degree □ Associate degree □ Vocational training after high school □ High School □ Elementary/Middle School □ No formal education
5	What religion do you identify as or practice?	□ Christianity □ Islam □ Buddhism □ Hinduism □ Judaism □ Other (specify) _____

		□ None
6	What is your sexual orientation	□ Heterosexual (Straight) □ Homosexual (Lesbian) □ Bisexual □ Pansexual □ Other (specify) _____ □ None
Employment-related		
7	Are you currently working?	□ Yes □ No □ Self-employed
8	What is your employment status?	□ Full time □ Part time □ Other (specify) _____ □ NA
9	What is your annual income?	$_____
Nativity		
The following questions ask about your country of birth and time lived in the U.S. This information will be used solely for research purposes and will be kept confidential.		
10	Where were you born?	□ In the U.S. or U.S. territory □ Outside of the U.S. and its territories
11	**Skip to question 12 if U.S. born.** If born outside of the U.S., how many years have you lived in the U.S.?	_____
HIV Status and PrEP use		
The following questions ask about your experience with HIV testing, status and Pre-Exposure Prophylactic (PrEP) medication use.		
12	Have you ever been tested for HIV?	□ Yes □ No
13	Have you ever been told by health professional that you are HIV positive or have AIDS? **If you answered No, skip to question # 15**	□ Yes □ No
14	If yes, are you currently taking antiretroviral medication for HIV?	□ Yes □ No

15	Were you ever prescribed Pre-Exposure Prophylactic (PrEP) medication?	□ Yes □ No
Awareness of undetectable equals untransmittable		
The following questions ask about your awareness of the phrase U=U		
16	Have you heard about undetectable HIV virus is untransmittable prior to this study?	□ Yes □ No
17	If yes, from whom/where?	□ Health care provider □ Family/friends □ Print media □ Social Media □ Other (specify) _____ □ NA

Section 2 – Health Related

Patient Health Questionnaire – 4(Kroenke et al., 2009)

The following questions will ask you about your mood over the past two weeks.

1	Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)		
	a) Feeling nervous, anxious or on edge.						
	b) Not being able to stop or control worrying.						
	c) Little interest or pleasure in doing things.						
	d) Feeling down, depressed, or hopeless.						

HIV Risk Perception Scale(Napper et al., 2012)

Instructions: The following questions ask about your perceptions of HIV risk, i.e., what you think and feel about becoming infected with HIV. Please place a check mark (√) in the box that most closely reflects your perceptions for each question.

		Extremely unlikely (1)	Very unlikely (2)	Somewhat likely (3)	Very likely (4)	Extremely likely (5)	
2	What is your gut feeling about how likely you are to get infected with HIV?						
		None of the time (1)	Rarely (2)	Some of the time (3)	A moderate amount of time (4)	All of the time (5)	
3	I worry about getting infected with HIV						
		Very hard to do (1)	Hard to do (2)	Easy to do (3)	Very easy to do (4)		
4	Picturing self getting HIV is something I find:						
		Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Somewhat agree (4)	Agree (5)	Strongly Agree (6)
5	I am sure I will NOT get infected with HIV						
6	I feel vulnerable to HIV infection						
7	There is a chance, no matter how small, I could get HIV						
		Zero (1)	Almost zero (2)	Small (3)	Moderate (4)	Large (5)	Very large (6)
8	I think my chances of getting						

	infected with HIV are:						
		Never thought about (1)	Rarely thought about (2)	Thought about some of the time (3)	Thought about often (4)		
9	Getting HIV is something I have						
HIV Risk-Taking Behavior Scale(Darke et al., 1991)							
The following questions ask about sexual and drug use behaviors that may put people at risk for HIV. Clients are defined as contacts with whom you have exchanged sex for money.							
		None (0)	One (1)	Two (2)	3-5 people (3)	6-10 people (4)	More than 10 people (5)
10	How many people, including clients have you had sex with in the last month? **If you answered NONE, skip to question # 15**						
		No regular partner/no penetrative sex (0)	Every time (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
11	How often have you used condoms when having sex with your regular partner(s) in the last month?						
		No casual partner/no penetrative sex	Every time (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)

		(0)					
12	How often have you used condoms when you had sex with casual partners in the last month?						
		No paid sex/no penetrative sex (0)	Every time (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
13	How often have you used condoms when you have been paid for sex in the last month?						
		No times (0)	One time (1)	Two times (2)	3-5 times (3)	6-10 times (4)	More than 10 times (5)
14	How many times did you have anal sex in the last month?						
		Hasn't hit up (0)	Once a week or less (1)	More than once a week (but less than once a day) (2)	Once a day (3)	2-3 times a day (4)	More than 3 times a day (5)
15	How many times have you hit up (i.e., injected any drugs in the last month)? **If you answered NONE, skip to question 21.**						

		No times (0)	One time (1)	Two times (2)	3-5 times (3)	6-10 times (4)	More than 10 times (5)
16	How many times in the last month have you used a needle after someone else have already used it?						
		None (0)	One (1)	Two (2)	3-5 people (3)	6-10 people (4)	More than 10 people (5)
17	How many different people have used a needle before you in the last month?						
		No times (0)	One time (1)	Two times (2)	3-5 times (3)	6-10 times (4)	More than 10 times (5)
18	How many times in the last month has someone used a needle after you have used it?						
		Does not reuse (0)	Every time (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
19	How often, in the last month, have you cleaned needles before re-using them?						
		Does not reuse (0)	Every time (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)

20	Before using needles again, how often in the last month did you use bleach to clean them?						

Experience with drug use (McNeely et al., 2016)							
The following questions ask about your use of any drug in the past year. Please place a check mark (√) in the box that best represent your position for each question.							
	Please indicate how often you have used any of the following:	Never 0	Once or Twice 1	Monthly 2	Weekly 3	Daily or almost Daily 4	
21	In the past 12 months, how often have you used any tobacco products?						
22	In the past 12 months, how often have you had 4 or more drinks containing alcohol in one day?						
23	In the past 12 months, how often have you used any drugs including marijuana, cocaine or crack, heroin, methamphetamine (crystal meth), hallucinogens, ecstasy (MDMA)?						

24	In the past 12 months, how often have you used any prescription medications just for the feeling, more than prescribed or that were not prescribed for you?						

Section 3 – HIV-Related Attitudes						
Instructions: The following questions will ask about your attitudes, beliefs and perceptions toward people living with HIV, HIV treatments and having an undetectable HIV status. Place a check mark (√) in the box that best represent your position for each question.						
Attitude toward people living with HIV/AIDS (PLWHA)(Li et al., 2007)						
		Strongly disagree (5)	Disagree (4)	Neutral (3)	Agree (2)	Strongly Agree (1)
1	People who got HIV/AIDS through sex or drug use got what they deserved.					
2	AIDS is a punishment for bad behavior.					
3	People who behave promiscuously should be blamed for AIDS.					
4	PLWHA should have the right to marry.					
5	You feel afraid of PLWHA.					
6	You would feel ashamed if someone you know got HIV/AIDS.					
7	You would feel ashamed if someone in your family got HIV/AIDS.					
8	You would not buy from a food vendor who has HIV/AIDS.					
9	You would not share eating utensils with a PLWHA because you are afraid of HIV infection.					
Attitude toward HIV treatment(Holt et al., 2014)						

		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
10	An HIV-positive person who is on HIV treatments is unlikely to transmit HIV.					
11	A person with an undetectable viral load cannot pass on HIV.					
12	If every HIV-positive person was on treatment the HIV epidemic would be over.					
13	People should start HIV treatment as soon as they are diagnosed.					
14	People should delay treatment until it is absolutely necessary.					
15	HIV-positive people should go on treatment to protect their partners.					

Attitudes toward undetectable equals untransmittable (Carneiro et al., 2020; H. Jonathon Rendina & Parsons, 2018)

Undetectable = Untransmittable (U=U) indicates that a person living with HIV (PLHIV) and who is on antiretroviral therapy (ART) and has an undetectable HIV viral load in their blood for at least six months cannot transmit HIV through sex. This is a new HIV prevention method that is supported by scientific studies and public health officials. Given this information, choose a response that best represents your position for the following questions.

		Completely inaccurate (1)	Somewhat inaccurate (2)	Somewhat accurate (3)	Completely accurate (4)	I Do not know (5)
16	With regard to HIV-positive individuals transmitting HIV through sexual contact, how accurate do you believe					

	the slogan Undetectable = Untransmittable is?					
		No risk (1)	Small risk (2)	Medium risk (3)	High risk (4)	Complete risk (5)
17	What is the risk that an HIV+ individual who is currently undetectable could transmit HIV sexually to his/her partner?					
		Very unlikely (1)	Unlikely (2)	Unsure (3)	Likely (4)	Very likely (5)
18	How likely would you be to have condomless sex with a partner who is HIV-positive and has an undetectable HIV load?					

Section 4 – General							
Instructions: The following questions will ask you about your general assessment of your quality of life and your use of social media. Place a check mark (√) in the box that best describes your position.							
Quality of life							
		Poor (1)	Fair (2)	Good (3)	Very Good (4)	Excellent (5)	
1	Overall, you would describe the quality of your life as:						
Social Media Use							
		None (0)	One account (1)	Two accounts (2)	3-5 accounts (3)	6-10 accounts (4)	More than 10 accounts (5)

2	How many social media sites do you have accounts with? **(If you answered NONE, skip to section 5)**						
		Less than 30 minutes (1)	30 – 60 minutes (2)	1-2 hours (3)	2-3 hours (4)	More than 3 hours (5)	
3	How much time do you spend on social media per day?						
		No impact (0)	Minimal impact (1)	Some impact (2)	High impact (3)	Very high impact (4)	
4	To what extent do you think social media impact your attitude toward people living with HIV who have an undetectable viral load?						

PART II – SOCIAL FACTORS

Section 5 – Interpersonal Factors

Instructions: The questions in this section will ask you about your perceptions about social support that is available to you and your family relationships. Please place a check mark (√) inside the box that best reflects your position.

Perceived Social Support (Lin et al., 2019)

		Not true at all (1)	Mostly not true (2)	Partly true (3)	True (4)	Very true (5)
1	I experience a lot of understanding and security from others.					
2	I know a very close person whose help I can always count on.					
3	If necessary, I can easily borrow something I might need from neighbors or friends.					
4	I know several people with whom I like to do things.					
5	When I am sick, I can without hesitation ask friends and family to take care of important matters for me.					
6	If I am down, I know to whom I can go without hesitation.					

Proximity to people with HIV

7	Do you have any family member who has been diagnosed with HIV?	□ Yes □ No
8	Do you have any friend who has been diagnosed with HIV?	□ Yes □ No

Universal Violence Prevention Screen (Heron et al., 2003)

The following questions will ask you about your experiences of intimate partner violence in the last year.

9	Have you been in a relationship with a partner in the past year?	□ Yes □ No

	If you answered NO, skip to section 6.	
	If yes, within the past year has a partner (a-e):	
	a) Slapped, kicked, pushed, choked, or punched you?	□ Yes □ No
	b) Forced or coerced you to have sex?	□ Yes □ No
	c) Threatened you with a knife or gun to scare or hurt you?	□ Yes □ No
	d) Made you afraid that you could be physically hurt?	□ Yes □ No
	e) Repeatedly used words, yelled, or screamed in a way that frightened you, threatened you, put you down, or made you feel rejected?	□ Yes □ No

Section 6 – Organizational and Community Factors

Instructions: The questions in this section will ask you about your health care access and beliefs, norms and neighborhood characteristics within your community. Please place a check mark (√) inside the box that best reflects your position.

Organizational Factors

The following questions are about your health care access and your experience with your primary care provider (PCP).

1	Do you have a primary care provider (PCP)? **If you answered NO, skip to question # 5.**	□ Yes □ No				
		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
2	I am comfortable discussing my sexual health/HIV concerns with my PCP.					
		Extremely dissatisfied (0)	Dissatisfied (1)	Neutral (2)	Satisfied (3)	Extremely Satisfied (4)
3	How would you rate your last appointment/visit with your PCP?					
		<30 mins (1)	30 – 59 mins (2)	60 mins+ (3)	Unknown (9)	
4	How long is the commute time to your PCP?					

Community factors						
The following questions will ask about your beliefs held by most people in your community and the neighborhood characteristics where you live.						
Community attitude toward people living with HIV and treatments for HIV						
		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
5	Most people would not buy vegetables from a shopkeeper or food seller that they knew had HIV.					
6	Most people in my culture think that HIV treatment is effective (i.e., makes people healthier).					
7	Most people in the community (parents, siblings, friends etc.…) will trust that undetectable HIV load is untransmittable, that is if the HIV virus is not seen/detected in the blood of an HIV positive person, it cannot be passed on to another person.					
8	People living with HIV and have an undetectable viral load will engage in sexual risky behaviors such as having multiple partners, unprotected sex and unprotected sex under the influence of alcohol/drugs.					
Neighborhood characteristics – built environment						
9	People in this neighborhood can be trusted.					
10	People in this neighborhood are afraid to go out at night due to violence.					
11	Gangs are a serious issue in this neighborhood.					
12	People in this neighborhood generally get along with each other.					
13	Public transportation is easily accessed in this neighborhood.					

End of survey 😊

Thank you for participating in this survey. We appreciate your responses and your time.

Appendix F

Study Flyer

ATTITUDES TOWARD U=U STUDY

ARE YOU:

- A MINORITY WOMAN
- 18 YEARS AND OLDER
- & RESIDING IN EL PASO REGION

We would like to invite you to participate in this doctoral research study!

Incentive (Gift card) for participation: $10.00 for survey and $15.00 for interview

Location: In person or online/virtual

Date/Time: You choose

You can complete the online survey anytime at https://uequalsu.questionpro.com

TO PARTICIPATE OR TO GET MORE INFORMATION CONTACT:
RESEARCHER: ROBERTA THIMBRIEL
EMAIL: RMTHIMBRIEL@MINERS.UTEP.EDU
CELL:915-422-2686

UTEP

Appendix G

Interview and Survey Consent Forms

INFORMED CONSENT FOR RESEARCH INVOLVING HUMAN SUBJECTS

University of Texas at El Paso (UTEP) Institutional Review Board

PARTICIPATION IN INTERVIEW

Exploration and Analysis of Attitudes and Determinants Toward Undetectable Equals Untransmittable (U=U) Among Minority Women

Principal Investigator: Roberta Thimbriel, M.S., M.ED., MLS (ASCP)^{cm}

UTEP Interdisciplinary Health Sciences PhD Program, College of Health Sciences

Introduction

Your voluntary participation is being requested in a study carried out by a doctoral candidate at the University of Texas at El Paso (UTEP). This interview contains questions about yourself, your opinions, beliefs, attitudes and experiences related to HIV risk, prevention, treatment and transmission. It will also contain questions about your experience with HIV stigma, community beliefs and sociocultural factors that impact attitudes toward having an undetectable viral load. Before agreeing to take part in this study, it is important that you read and understand this consent form. Please ask the study researcher conducting the interview to explain any words or information that you do not clearly understand.

Why is this study being done?

You are requested to participate in this study because you are an ethnic/racial minority woman 18 years old or above and are living in the El Paso region. This study is being done to understand the awareness and attitudes of at-risk racial/ethnic minority women toward the concept of undetectable equals untransmittable (U=U), which means that people living with HIV (PLHIV) have a low level of HIV in their blood circulation and the HIV is not passed sexually to others. The results will help to inform public health programs at the individual and community levels, addressing factors that impact attitudes and promote uptake of HIV prevention strategies among women at risk for HIV. This study is a partial fulfillment of the requirements for the successful completion of the doctoral degree (PhD) in Interdisciplinary Health Sciences Program for the principal investigator.

Taking part in this study involves:

If you decide to take part in this study, you will be answering open-ended questions in an interview with probes. You can choose to do the interview face to face or online. The interview which contains two parts, including an initial self-administered, or researcher completed if online, standard survey, will lasts for approximately 30 minutes and will be recorded. During the interview you will be asked to answer questions about yourself, your opinions, beliefs, attitudes and experiences toward people living with HIV (PLHIV), HIV treatment and risk behaviors, and U=U. Besides this interview, you can also complete a survey as part of the study if you agree to do so. Please inform the researcher of your decision to partake in the survey directly in-person, or through telephone or email provided below.

Risks and discomforts of the study

This individual interview has no physical risks. Minimal discomfort may be experienced by participants when answering questions about sensitive topics. If you feel very uncomfortable or distressed by any question, you may choose to skip any question or stop partaking at any time. If you express or the interviewer observes any distress through overt changes in your behavior, we will be able to refer you to appropriate behavioral health support services needed.

What will happen if I am injured in this study?

The University of Texas at El Paso and its affiliates do not offer to pay for or cover the cost of medical treatment for research related illness or injury. No funds have been set aside to pay or reimburse you in the event of such injury or illness. You will not give up any of your legal rights by signing this consent form. You should report any such injury to Roberta Thimbriel, the Principal Investigator at (915) 422-2686 or email at rmthimbriel@miners.utep.edu.

Benefits to taking part in this study

There is no direct benefit to you from being in this study. Your participation in this study will provide information that may help to promote HIV prevention among racial/ethnic minority women who are at risk for HIV through targeted public health intervention for promoting U=U message among high-risk groups. Participating in this study may also increase your awareness of HIV risk behaviors and factors associated with increased risk engagement. Increasing awareness of these issues may lead to a reduction of HIV incidence and prevalence among racial/ethnic minority women and better health outcomes for those infected with HIV. At the end of your participation, you will also receive links to online information and resources for HIV-related risk factors.

Who is paying for this study?

This study is partially funded by the Interdisciplinary Health Sciences Department in the College of Health Sciences at the University of Texas at El Paso through the PhD Candidacy award.

What are my costs?

There is no direct cost to you for participating in this study.

Will I be paid to participate in this study?

In recognition of your time and contribution by participating in the study you will receive a $15.00 USD gift card. If you are partaking online, you may provide your email verbally at the end of your participation to receive your gift card electronically; the email will be excluded from interview data and the email will be deleted after the gift card is sent.

What other options are there?

You have the option not to take part in this study. If you choose to take part, you have the right to stop at any time.

What if I want to withdraw, or am asked to withdraw from this study?

If you decide to withdraw from this study you are encouraged to talk to the interviewer and/or researcher so that he or she knows why you are leaving the study. The researcher may also decide to stop your participation without your permission, if s/he thinks that you are being

psychologically stressed as a result of participating in the study.

Who do I call if I have questions or problems?

You may ask any questions you have now or at any time. If you have questions about this study later, you may contact Roberta Thimbriel, the Principal Investigator at (915) 422-2686 or at email rmthimbriel@miners.utep.edu. She will be able to provide more information about this research.

If you have questions or concerns about your participation as a research subject, please contact Christina Ramirez Administrator of the Institutional Review Board (IRB) at UTEP at (915) 747-6590 or irb.orsp@utep.edu.

What about confidentiality?

Your participation in this study is confidential. The data collected will be kept confidential and your name will not be connected with answers you give in the interview or used in any reports. The interview will be transcribed verbatim and a unique code will be assigned to participants for cross-referencing audio and transcript only. Only the researcher will have access to the consent form containing your name, which will be kept separate at the Minority AIDS Research Center (MARC) office under double-lock and key. If you are partaking online, you may provide your email at the end of your participation to receive your gift card electronically; the email will be deleted after the gift card is sent.

A back-up database of the audio recordings and transcribed interview scripts will be created in order to protect against loss of data due to technical difficulties and will be accessible only to the researcher on a password protected computer. All transcripts will be kept in a locked cabinet and will be accessed only by the researcher and coding assistant(s). Transcribed data may be retained for up to five years and recorded interviews will be deleted at the completion of all data analysis. Your name or any personal information that may identify you with your interview and/or transcripts will not be used when the findings from this study are reported and/or published.

Some organizations that may inspect and/or copy your research records for quality assurance and data analysis include, but are not necessarily limited to:

- Office of Human Research Protections
- UTEP Institutional Review Board

Due to the need to release information to these parties and the use of electronic platforms for interviews, absolute confidentiality cannot be guaranteed.

Mandatory reporting

If information is revealed about child abuse or neglect, or potentially dangerous future behavior to others, the law requires that this information be reported to the proper authorities.

Authorization Statement

I have read each page of this form about the study. I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study at any time. I will get a copy of this consent form either electronically or paper form and can get information on results of the study later if I wish.

I have read all the items on the information sheet, and all questions about the study have been answered to my satisfaction. I understand the following:

- My participation is voluntary;
- I can discontinue participation at any time without penalty;
- My name will not appear on the interview and/or transcripts or other data collection forms: only a code number will be used;
- All information will be kept in a locked electronic file (audio recordings) and a locked cabinet (written material).

  All written and published information will be reported with no reference to individuals

_____ _____

Participant Signature Date

Consent form explained/witnessed by:

_____ _____

Name Signature

INFORMED CONSENT FOR RESEARCH INVOLVING HUMAN SUBJECTS

University of Texas at El Paso (UTEP) Institutional Review Board

PARTICIPATION IN SURVEY

Exploration and Analysis of Attitudes and Determinants Toward Undetectable Equals Untransmittable (U=U) Among Minority Women

Principal Investigator: Roberta Thimbriel, M.S., M.ED., MLS (ASCP)^{cm}

UTEP Interdisciplinary Health Sciences PhD Program, College of Health Sciences

Introduction

Your voluntary participation is being requested in a study carried out by a doctoral candidate at the University of Texas at El Paso (UTEP). This survey contains questions about yourself, your opinions, beliefs, attitudes and experiences related to HIV risk, prevention, treatment and transmission. It will also contain questions about your experience with HIV stigma, intimate partner violence, mental health disorders and substance use. Before agreeing to take part in this study, it is important that you read and understand this consent form. Please ask the study researcher handling the survey to explain any words or information that you do not clearly understand.

Why is this study being done?

You are requested to participate in this study because you are an ethnic/racial minority woman 18 years old or above and are living in the El Paso region. This study is being done to understand the awareness, attitudes and associated factors of at-risk racial/ethnic minority women toward the concept of undetectable equals untransmittable (U=U), which means that people living with HIV (PLHIV) have a low level of HIV in their blood circulation and the HIV is not passed sexually to others. The results will help to inform public health programs at the individual and community levels, addressing factors that impact attitudes and promote uptake of HIV prevention strategies among women at risk for HIV. This study is a partial fulfillment of the requirements for the successful completion of the doctoral degree (PhD) in Interdisciplinary Health Sciences Program for the principal investigator.

Taking part in this study involves:

If you agree to take part in this study, you will be answering questions on a survey that has been compiled using appropriate scales for the constructs being measured. You can choose to do the survey on paper or electronically/online. If you choose to complete the survey online/electronically you will provide consent by clicking on the "agree" button and a link to download the consent form will be available. It will take about 30 minutes to complete this survey. During the survey you will be asked to answer questions about yourself, your opinions, beliefs, attitudes and experiences related to HIV risk, prevention, treatment and transmission. Besides this survey, you can also partake in an interview as part of the study if you agree to do so. Please inform the researcher of your decision to partake in the interview directly in-person, or through telephone or email provided below.

Risks and discomforts of the study

This individual survey has no physical risks. Minimal discomfort may be experienced by participants when answering questions about sensitive topics. If you feel very uncomfortable or distressed by any question, you may choose to skip any question or stop partaking at any time. If

you express or the interviewer observes any distress through overt changes in your behavior, we will be able to refer you to appropriate behavioral health support services needed.

What will happen if I am injured in this study?

The University of Texas at El Paso and its affiliates do not offer to pay for or cover the cost of medical treatment for research related illness or injury. No funds have been set aside to pay or reimburse you in the event of such injury or illness. You will not give up any of your legal rights by signing this consent form. You should report any such injury to Roberta Thimbriel, the Principal Investigator at (915) 422-2686 or email at rmthimbriel@miners.utep.edu.

Benefits to taking part in this study

There is no direct benefit to you from being in this study. Your participation in this study will provide information that may help to promote HIV prevention among racial/ethnic minority women who are at risk for HIV through targeted public health intervention for promoting U=U message among high-risk groups. Participating in this study may also increase your awareness of HIV risk behaviors and factors associated with increased risk engagement. Increasing awareness of these issues may lead to a reduction of HIV incidence and prevalence among racial/ethnic minority women and better health outcomes for those infected with HIV. At the end of your participation, you will also receive links to online information and resources for HIV-related risk factors.

Who is paying for this study?

This study is partially funded by the Interdisciplinary Health Sciences Department in the College of Health Sciences at the University of Texas at El Paso through the PhD Candidacy Award.

What are my costs?

There is no direct cost to you for participating in this study.

Will I be paid to participate in this study?

In recognition of your time and contribution for participating in the study you will receive a $10.00 USD gift card. If you are partaking online, you may provide your email at the end of your participation to receive your gift card electronically; the question at the end of the survey to provide the email will be optional if you want to receive the gift card. Your email will be excluded /deleted from downloaded data from the software and the email will be deleted after the gift card is sent.

What other options are there?

You have the option not to take part in this study. If you choose to take part, you have the right to stop at any time.

What if I want to withdraw, or am asked to withdraw from this study?

If you decide to withdraw from this study you are encouraged to talk to the interviewer and/or researcher so that he or she knows why you are leaving the study. The researcher may also decide to stop your participation without your permission, if s/he thinks that you are being psychologically stressed as a result of participating in the study.

Who do I call if I have questions or problems?

You may ask any questions you have now or at any time. If you have questions about this study later, you may contact Roberta Thimbriel, the Principal Investigator at (915) 422-2686 or at email rmthimbriel@miners.utep.edu. She will be able to provide more information about this research.

If you have questions or concerns about your participation as a research subject, please contact the Institutional Review Board (IRB) at UTEP at (915) 747- 6590 or irb.orsp@utep.edu.

What about confidentiality?

Your participation in this study is confidential. The data collected will be kept confidential and your name will not be connected with answers you give in the survey or used in any reports. Only the case researcher will have access to the consent form containing your name, which will be kept separate at the Minority AIDS Research Center (MARC) office under double-lock and key. If you are partaking online, you may provide your email at the end of your participation to receive your gift card electronically; the email will be deleted after the gift card is sent.

A back-up database of the surveys will be created in order to protect against loss of data due to technical difficulties and will be accessible only to the researcher on a password protected computer. All surveys will be kept in a locked cabinet and will be accessed only by the researcher and data entry assistant(s). Data will be stored for five years. Your name or any personal information that may identify you with your survey answers will not be used when the findings from this study are reported and/or published.

Some organizations that may inspect and/or copy your research records for quality assurance and data analysis include, but are not necessarily limited to:

- Office of Human Research Protections
- UTEP Institutional Review Board

Due to the need to release information to these parties and the use of electronic platforms for survey data collection, absolute confidentiality cannot be guaranteed.

Mandatory reporting

If information is revealed about child abuse or neglect, or potentially dangerous future behavior to others, the law requires that this information be reported to the proper authorities.

Authorization Statement

I have read each page of this form about the study. I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study at any time. I will get a copy of this consent form either electronically or paper form and can get information on results of the study later if I wish.

I have read all the items on the information sheet, and all questions about the study have been answered to my satisfaction. I understand the following:

- My participation is voluntary;
- I can discontinue participation at any time without penalty;

- My name will not appear on the survey or other data collection forms: only a code number will be used;
- All information will be kept in a locked electronic file (database) and a locked cabinet (written material).

  All written and published information will be reported with no reference to individuals

_____ _____

Participant Signature Date

Consent form explained/witnessed by: _____ _____

Name Signature

Appendix H

Information sheet

Thank you for participating in this survey. We appreciate your time and responses.

Information about HIV testing and care resources can be found at https://www.dshs.texas.gov/hivstd/services/service_e.shtm

Mental health resources for El Paso are found at https://www.epstrong.org/mental-health.php

Substance abuse treatment centers can be found at https://www.freerehabcenters.org/city/tx-el_paso and https://www.aliviane.org/

Information about help and support for family violence can be found at https://www.epcounty.com/da/victim-services.htm and https://www.domesticshelters.org/help/tx/el-paso

Gracias por participar en esta encuesta. Agradecemos su tiempo y respuestas.

Puede encontrar información sobre las pruebas del VIH y los recursos de atención en https://www.dshs.texas.gov/hivstd/services/service_e.shtm

Los recursos de salud mental para El Paso se encuentran en https://www.epstrong.org/mental-health.php

Los centros de tratamiento por abuso de sustancias se pueden encontrar en https://www.freerehabcenters.org/city/tx-el_paso y https://www.aliviane.org/

Puede encontrar información sobre ayuda y apoyo para la violencia familiar en https://www.epcounty.com/da/victim-services.htm and https://www.domesticshelters.org/help/tx/el-paso

Appendix I

Final Codebook

Social ecological factors and their relationship to attitudes toward U=U Survey

PART 1 – INDIVIDUAL FACTORS

Variable Name Codes	#	Question	Responses
Section 1 - Individual Demographics			
RACE_ETHNICITY	1	What is your race/ethnicity?	□ White, Non-Hispanic □ Black/African American □ Hispanic/Latino □ Asian American, native Hawaiian or other Pacific Islanders □ Native American/American Indian □ Bi-racial □ Multiracial Others (please specify): _____ _____
AGE	2	What is your age in years?	_____ years
MARSTATUS	3	What is your marital status?	□ Single □ Married □ Widowed □ Separated □ Divorced □ Cohabitating □ Civil union
EDUCATION	4	What is the highest level of education you have completed?	□ Master's degree and higher □ Bachelor's degree □ Associate degree □ Vocational training after high school □ High School □ Elementary/Middle School □ None
RELIGION	5	What religion do you identify as or practice?	□ Christianity □ Islam

			□ Buddhism □ Hinduism □ Judaism □ Other (specify) _____ □ None
REL_OTHER		Name of other religion	
SEX_ORIENT	6	What is your sexual orientation	□ Heterosexual (Straight) □ Homosexual (Lesbian) □ Bisexual □ Pansexual □ Other (specify) _____ □ None
Employment-related			
CURR_WORK	7	Are you currently working?	□ Yes □ No □ Self-employed
EMP_STATUS	8	What type of employment status?	□ Full time □ Part time □ Other (specify) _____ □ NA
INCOME	9	What is your annual income?	$_____
Nativity			
The following questions ask about your country of birth and time lived in the U.S. This information will be used solely for research purposes and will be kept confidential.			
BIRTH	10	Where were you born?	□ In the U.S. or U.S. territory □ Outside of the U.S. and its territories
YEARS_US	11	**Skip to question 12 if U.S. born.** If born outside of U.S., how many years have you lived in the U.S.?	_____ _
HIV Status and PrEP use			
The following questions ask about your experience with HIV testing, status and Pre-Exposure Prophylactic (PrEP) medication use.			

HIV_TEST	12	Have you ever been tested for HIV?	□ Yes □ No
HIV_STATUS	13	Have you ever been told by health professional that you are HIV positive or have AIDS? **If you answered No, skip to question # 15**	□ Yes □ No
HIV_ART	14	If yes, are you currently taking antiretroviral medication for HIV?	□ Yes □ No
PrEP	15	Were you ever prescribed Pre-Exposure Prophylactic (PrEP) medication?	□ Yes □ No
Awareness of undetectable equals untransmittable			
The following questions ask about your awareness of the phrase U=U			
UUAWARE	16	Have you heard about undetectable HIV virus is untransmittable prior to this study?	□ Yes □ No
UUSOURCE	17	If yes, from whom/where?	□ Health care provider □ Family/friends □ Print media □ Social Media □ Other (specify) _____ □ NA
UUSOURCE_OTHER		Other source of U=U awareness	

Section 2 – Health Related			
Patient Health Questionnaire – 4(Kroenke et al., 2009)			
The following questions will ask you about your mood over the past two weeks.			
	1	Over the last 2 weeks, how often have you been bothered by the following problems?	
PHQ4A		a) Feeling nervous, anxious or on edge	□ Not at all □ Several days

			□ More than half the days □ Nearly every day
PHQ4B		b) Not being able to stop or control worrying	□ Not at all □ Several days □ More than half the days □ Nearly every day
PHQ4C		c) Little interest or pleasure in doing things	□ Not at all □ Several days □ More than half the days □ Nearly every day
PHQ4D		d) Feeling down, depressed, or hopeless	□ Not at all □ Several days □ More than half the days □ Nearly every day
HIV Risk Perception Scale(Napper et al., 2012)			
Instructions: The following questions ask about your perceptions of HIV risk, i.e., what you think and feel about becoming infected with HIV. Please place a check mark (√) in the box that most closely reflect your perceptions for each question.			
HRPS2	2	What is your gut feeling about how likely you are to get infected with HIV?	□ Extremely unlikely □ Very unlikely □ Somewhat likely □ Very likely □ Extremely likely
HRPS3	3	I worry about getting infected with HIV	□ None of the time □ Rarely □ Some of the time □ A moderate amount of time □ All of the time
HRPS4	4	Picturing self getting HIV is something I find:	□ Very hard to do □ Hard to do □ Easy to do □ Very easy to do
HRPS5	5	I am sure I will NOT get infected with HIV	□ Strongly disagree □ Disagree □ Somewhat disagree □ Somewhat agree □ Agree □ Strongly Agree
HRPS6	6	I feel vulnerable to HIV infection	□ Strongly disagree □ Disagree

			□ Somewhat disagree □ Somewhat agree □ Agree □ Strongly Agree
HRPS7	7	There is a chance, no matter how small, I could get HIV	□ Strongly disagree □ Disagree □ Somewhat disagree □ Somewhat agree □ Agree □ Strongly Agree
HRPS8	8	I think my chances of getting infected with HIV are:	□ Zero □ Almost zero □ Small □ Moderate □ Large □ Very large
HRPS9	9	Getting HIV is something I have	□ Never thought about □ Rarely thought about □ Thought about some of the time □ Thought about often
HIV Risk-Taking Behavior Scale (Darke et al., 1991)			
The following questions ask about sexual and drug use behaviors that may put people at risk for HIV.			
HRTBS10	10	How many people, including clients have you had sex with in the last month? **If you answered NONE, skip to question # 15**	□ None □ One □ Two □ 3-5 people □ 6-10 people □ More than 10 people
HRTBS11	11	How often have you used condoms when having sex with your regular partner(s) in the last month?	□ No regular partner/no penetrative sex □ Every time □ Often □ Sometimes □ Rarely □ Never
HRTBS12	12	How often have you used condoms when you had sex with casual partners in the last month?	□ No casual partner/no penetrative sex □ Every time □ Often □ Sometimes □ Rarely □ Never

HRTBS13	13	How often have you used condoms when you have been paid for sex in the last month?	□ No paid sex/no penetrative sex □ Every time □ Often □ Sometimes □ Rarely □ Never
HRTBS14	14	How many times did you have anal sex in the last month?	□ No times □ One time □ Two times □ 3-5 times □ 6-10 times □ More than 10 times
HRTBS15	15	How many times have you hit up (i.e., injected any drugs in the last month? **If you answered NONE, skip to question 21.**	□ Hasn't hit up □ Once a week or less □ More than once a week (but less than once a day) □ Once a day □ 2-3 times a day □ More than 3 times a day
HRTBS16	16	How many times in the last month have you used a needle after someone else have already used it?	□ No times □ One time □ Two times □ 3-5 times □ 6-10 times □ More than 10 times
HRTBS17	17	How many different people have used a needle before you in the last month?	□ None □ One person □ Two people □ 3-5 people □ 6-10 people □ More than 10 people
HRTBS18	18	How many times in the last month has someone used a needle after you have used it?	□ No times □ One time □ Two times □ 3-5 times □ 6-10 times □ More than 10 times
HRTBS19	19	How often, in the last month, have you cleaned needles before re-using them?	□ Does not re-use □ Every time □ Often □ Sometimes □ Rarely □ Never

HRTBS20	20	Before using needles again, how often in the last month did you use bleach to clean them?	□ Does not re-use □ Every time □ Often □ Sometimes □ Rarely □ Never
Experience with drug use			
The following questions ask about your use of any drug in the past year. (McNeely et. al., 2016)			
		Please indicate how often you have used any of the following:	
TAPS21	21	In the past 12 months, how often have you used any tobacco products?	□ Never □ Once or twice □ Monthly □ Weekly □ Daily or almost daily
TAPS22	22	In the past 12 months, how often have you had 4 or more drinks containing alcohol in one day?	□ Never □ Once or twice □ Monthly □ Weekly □ Daily or almost daily
TAPS23	23	In the past 12 months, how often have you used any drugs including marijuana, cocaine or crack, heroin, methamphetamine (crystal meth), hallucinogens, ecstasy (MDMA)?	□ Never □ Once or twice □ Monthly □ Weekly □ Daily or almost daily
TAPS24	24	In the past 12 months, how often have you used any prescription medications just for the feeling, more than prescribed or that were not prescribed for you?	□ Never □ Once or twice □ Monthly □ Weekly □ Daily or almost daily

Section 3 – HIV-Related Attitudes			
Instructions: The following questions will ask about your attitudes, beliefs and perceptions toward people living with HIV, HIV treatments and having an undetectable HIV status. Place a check mark (√) in the box that best represent your position for each question.			
Attitude toward people living with HIV/AIDS (PLWHA)(Li et al., 2007)			
ATTPLWHA1	1	People who got HIV/AIDS through sex or drug use got what they deserved.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA2	2	AIDS is a punishment for bad behavior.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA3	3	People who behave promiscuously should be blamed for AIDS.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA4	4	PLWHA should have the right to marry.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA5	5	You feel afraid of PLWHA.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA6	6	You would feel ashamed if someone you know got HIV/AIDS.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA7	7	You would feel ashamed if someone in your family got HIV/AIDS.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTPLWHA8	8	You would not buy from a food vendor who has HIV/AIDS.	□ Strongly disagree □ Disagree □ Neutral □ Agree

			□ Strongly Agree
ATTPLWHA9	9	You would not share eating utensils with a PLWHA because you are afraid of HIV infection.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
Attitude toward HIV treatment(Holt et al., 2014)			
ATTHIVRX10	10	An HIV-positive person who is on HIV treatments is unlikely to transmit HIV.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTHIVRX11	11	A person with an undetectable viral load cannot pass on HIV.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTHIVRX12	12	If every HIV-positive person was on treatment the HIV epidemic would be over.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTHIVRX13	13	People should start HIV treatment as soon as they are diagnosed.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTHIVRX14	14	People should delay treatment until it is absolutely necessary.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
ATTHIVRX15	15	HIV-positive people should go on treatment to protect their partners.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
Attitudes toward undetectable equals untransmittable(Carneiro et al., 2020; H. Jonathon Rendina & Parsons, 2018)			
Undetectable = Untransmittable (U=U) indicates that a person living with HIV (PLHIV) and who is on antiretroviral therapy (ART) and has an undetectable HIV viral load in their blood for at least six months cannot transmit HIV through sex. This is a new HIV prevention method that is supported by scientific studies and public health officials. Given this information, choose a response that best represent your position for the following questions.			

ATTUU16	16	With regard to HIV-positive individuals transmitting HIV through sexual contact, how accurate do you believe the slogan Undetectable = Untransmittable is?	□ Completely inaccurate □ Somewhat inaccurate □ Somewhat accurate □ Completely accurate □ Do not know _____
ATTUU17	17	What is the risk that an HIV+ individual who is currently undetectable could transmit HIV sexually to his/her partner?	□ No risk □ Small risk □ Medium risk □ High risk □ Complete risk
ATTUU18	18	How likely would you be to have condomless sex with a partner who is HIV-positive and has an undetectable HIV load?	□ Very unlikely □ Unlikely □ Unsure □ Likely □ Very likely

Section 4 – General			
Instructions: The following questions will ask you about your general assessment of your quality of life and your use of social media. Place a check mark (√) in the box that best describes your position.			
Quality of life(Bonomi et al., 2000)			
QOL	1	How would you rate your quality of life?	□ Poor □ Fair □ Good □ Very good □ Excellent
Social Media Use			
SOCMED2	2	How many social media sites do you have accounts with? **(If you answered NONE, skip to section 5)**	□ None □ One □ Two □ 3-5 accounts □ 6-10 accounts □ More than 10 accounts
SOCMED3	3	How much time do you spend on social media per day?	□ Less than 30 minutes □ 30 – 60 minutes

			□ 1-2 hours □ 2-3 hours □ More than 3 hours
SOCMED4	4	To what extent do you think social media impact your attitude toward people living with HIV who have an undetectable viral load?	□ No impact □ Minimal impact □ Some impact □ High impact □ Very high impact

PART II – SOCIAL FACTORS

Section 5 – Interpersonal Factors			
Instructions: The questions in this section will ask you about your perceptions about social support that is available to you and your family relationships. Please place a check mark (√) inside the box that best reflects your position.			
Perceived Social Support(Lin et al., 2019)			
PSS1	1	I experience a lot of understanding and security from others.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true
PSS2	2	I know a very close person whose help I can always count on.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true
PSS3	3	If necessary, I can easily borrow something I might need from neighbors or friends.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true
PSS4	4	I know several people with whom I like to do things.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true
PSS5	5	When I am sick, I can without hesitation ask friends and family to take care of important matters for me.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true
PSS6	6	If I am down, I know to whom I can go without hesitation.	□ Not true at all □ Mostly not true □ Partly true □ True □ Very true

Proximity to people with HIV			
PROXHIV7	7	Do you have any family member who has been diagnosed with HIV?	□ Yes □ No
PROXHIV8	8	Do you have any friend who has been diagnosed with HIV?	□ Yes □ No
Universal Violence Prevention Screen (Heron et al., 2003)			

The following questions will ask you about your experiences of intimate partner violence in the last year.			
UVPS9	9	Have you been in a relationship with a partner in the past year? **If you answered NO, skip to section 6.**	□ Yes □ No
		If yes, within the past year has a partner (a-e):	
UVPS9A		a) Slapped, kicked, pushed, choked, or punched you?	□ Yes □ No
UVPS9B		b) Forced or coerced you to have sex?	□ Yes □ No
UVPS9C		c) Threatened you with a knife or gun to scare or hurt you?	□ Yes □ No
UVPS9D		d) Made you afraid that you could be physically hurt?	□ Yes □ No
UVPS9E		e) Repeatedly used words, yelled, or screamed in a way that frightened you, threatened you, put you down, or made you feel rejected?	□ Yes □ No

Section 6 – Organizational and Community Factors			
Instructions: The questions in this section will ask you about your health care access and beliefs, norms and neighborhood characteristics within your community. Please place a check mark (√) inside the box that best reflects your position.			
Organizational Factors			
The following questions are about your health care access and your experience with your primary care provider (PCP).			
PCP1	1	Do you have a primary care provider (PCP)? **If you answered NO, skip to question # 5.**	□ Yes □ No
PCP2	2	I am comfortable discussing my sexual health/HIV concerns with my PCP.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
PCP3	3	How would you rate your last appointment with your PCP?	□ Extremely dissatisfied □ Dissatisfied □ Neutral

			□ Satisfied □ Extremely Satisfied
PCP4	4	How long is the commute time to your PCP?	□ <30 mins □ 30-59 mins □ 60+ mins □ Unknown
Community factors			
The following questions will ask about your beliefs held by most people in your community and the neighborhood characteristics where you live.			
Community attitude toward people living with HIV and treatments for HIV			
COMMATT5	5	Most people would not buy vegetables from a shopkeeper or food seller that they knew had HIV.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
COMMATT6	6	Most people in my culture think that HIV treatment is effective (i.e., makes people healthier).	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
COMMATT7	7	Most people in the community (parents, siblings, friends etc.…) will trust that undetectable HIV load is untransmittable that is if the HIV virus is not seen/detected in the blood of an HIV, positive person, it cannot be passed on to another person.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
COMMATT8	8	People living with HIV and have an undetectable viral load will engage in sexual risky behaviors such as having multiple partners, unprotected sex and unprotected sex under the influence of alcohol/drugs.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
Neighborhood characteristics – built environment			
NBRHD9	9	People in this neighborhood can be trusted.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
NBRHD10	10	People in this neighborhood are afraid to go out at night due to violence.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree

NBRHD11	11	Gangs are a serious issue in this neighborhood.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
NBRHD12	12	People in this neighborhood generally get along with each other.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree
NBRHD13	13	Public transportation is easily accessed in this neighborhood.	□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly Agree

DUMMY VARIABLES CREATED				
RACE	RE_HISPLAT	1>1 2>0 3>0 4>0 5>0 6>0	RE_ HISPLAT 0 or 1	1- Hispanic 0 – Not Hispanic
	RE_BLACK	1>0 2>1 3>0 4>0 5>0 6>0	RE_BLACK 0 or 1	1 – Black/African American 0 – Not Black/African American
	RE_OTHER	1>0 2>0 3>1 4>1 5>1 6>1	RE_OTHER 0 or 1	1 – Other ethnicities 0 – Not Other ethnicities
MARITAL STATUS	MAR_STAT_SING	1>1 2>0 3>0 4>0 5>0 6>0 7>0 8>0	MAR_SING 0 OR 1	1 – Single 0 – Not Single
	MAR_STAT_MARR	1>0 2>1 3>0 4>0 5>0 6>0 7>0 8>0	MAR_MARR 0 OR 1	1 – Married 0 – Not married
	MAR_STAT_WIDSEP	1>0 2>0 3>1 4>1 5>0 6>0 7>0 8>0	MAR_STAT_WIDSEP 0 OR 1	1 – Widowed/separated 0 – Not widowed/separated
	MAR_STAT_DIV	1>0 2>0 3>0	MAR_STAT_DIV 0 OR 1	1 – Divorced 0 – Not divorced

		4>0 5>1 6>0 7>0 8>0		
	MAR_STAT_OTHER	1>0 2>0 3>0 4>0 5>0 6>1 7>1 8>1	MAR_STAT_OTHER 0 OR 1	1 – Other marital status 0 – Not other marital status
EDUCATION	EDU_BACHPLUS	1>1 2>1 3>0 4>0 5>0 6>0	BACH_PLUS 0 or 1	1- Bachelor's/higher 0 – Not Bachelor's/ higher
	EDU_ASSOC	1>0 2>0 3>1 4>0 5>0 6>0 7>0	EDU_ASSOC 0 or 1	1- Associates degree 0 – Not Associates degree
	EDU_VOC	1>0 2>0 3>0 4>1 5>0 6>0 7>0	EDU_VOC 0 or 1	1- Vocational training 0 – Not vocational training
	EDU_HIGH	1>0 2>0 3>0 4>0 5>1 6>0 7>0	EDU_HIGH 0 or 1	1- High school 0 – Not high school
	EDU_ELEM	1>0 2>0 3>0 4>0 5>0 6>1	EDU_ELEM 0 or 1	1- Elementary/no education 0 – Not elementary/no education

		7>1		
RELIGION	REL_CHRIST	1>1 2>0 3>0 4>0 5>0 6>0 7>0	REL_CHRIST 0 or 1	1- Christian religion 0 – Not Christian religion
	REL_OTHERS	1>0 2>1 3>1 4>1 5>1 6>0 7>1	REL_OTHERS 0 or 1	1- Other religions 0 – Not other religions
	REL_NONE	1>0 2>0 3>0 4>0 5>0 6>1 7>0	REL_NONE 0 or 1	1- Other religions 0 – Not other religions
SEXUAL ORIENTATION	SEX_HETERO	1>1 2>0 3>0 4>0 5>0 6>0	SEX_HETERO 0 or 1	1 - Heterosexual 0 – Not heterosexual
	SEX_HOMO	1>0 2>1 3>0 4>0 5>0 6>0	SEX_HOMO 0 or 1	1 - Homosexual 0 – Not homosexual
	SEX_BISEX	1>0 2>0 3>1 4>0 5>0 6>0	SEX_BISEX 0 or 1	1 - Bisexual 0 – Not bisexual
	SEX_OTHER	1>0 2>0 3>0 4>1 5>1 6>1	SEX_BISEX 0 or 1	1 – Other sexuality/none 0 – Not other sexuality/none

ADDED VARIABLES			
SPANLANG		Is survey completed in Spanish?	□ Yes □ No
RECODED VARIABLES			
Variable name		Old Code	New Code
PHQ4_A PHQ4_B PHQ4_C PHQ4_D	1>0 2>1 3>2 4>3	1- Not at all 2- Several days 3- More than half the days 4- Nearly every day	0- Not at all 1- Several days 2- More than half the days 3- Nearly every day
HRPS_2	1>1 2>2 3>3 4>4 5>4	1- Extremely unlikely 2- Very unlikely 3- Somewhat likely 4- Very likely 5- Extremely likely	1- Extremely unlikely 2- Very unlikely 3- Somewhat likely 4- Very likely 4- Extremely likely
HRPS_3	1>1 2>2 3>3 4>4 5>4 6>4	1- None of the time 2- Rarely 3- Some of the time 4- A moderate amount of time 5- A lot of the time 6- All of the time	1- None of the time 2- Rarely 3- Some of the time 4- A moderate amount of time 4- A lot of the time 4- All of the time
HRPS_4	Same	1-Very hard to do 2-Hard to do 3-Easy to do 4-Very easy to do	1-Very hard to do 2-Hard to do 3-Easy to do 4-Very easy to do
HRPS_5	1>6 2>5 3>4 4>3 5 >2 6>1	1- Strongly Disagree 2- Disagree 3- Somewhat disagree 4- Somewhat agree 5- Agree 6- Strongly Agree	6- Strongly Disagree 5- Disagree 4- Somewhat disagree 3- Somewhat agree 2- Agree 1- Strongly Agree

HRPS_6	1>1 2>2 3>2 4>4 5>5 6>6	1- Strongly Disagree 2- Disagree 3- Somewhat disagree 4- Somewhat agree 5- Agree 6- Strongly Agree	1- Strongly Disagree 2- Disagree 2- Somewhat disagree 4- Somewhat agree 5- Agree 6- Strongly Agree
HRPS_7	1>3 2>3 3>3 4>4 5>5 6>6	1- Strongly Disagree 2- Disagree 3- Somewhat disagree 4- Somewhat agree 5- Agree 6- Strongly Agree	3- Strongly Disagree 3- Disagree 3- Somewhat disagree 4- Somewhat agree 5- Agree 6- Strongly Agree
HRPS_8	Same	1- Zero 2- Almost zero 3- Small 4- Moderate 5- Large 6- Very large	1- Zero 2- Almost zero 3- Small 4- Moderate 5- Large 6- Very large
HRPS_9	Same	1- Never thought about 2- Rarely thought about 3- Thought about some of the time 4- Thought about often	1- Never thought about 2- Rarely thought about 3- Thought about some of the time 4- Thought about often
HRTBS_10	1>0 2>1 3>2 4>3 5>4 6>5	1- None 2- One 3- Two 4- 3-5 people 5- 6-10 people 6- More than 10 people	0- None 1- One 2- Two 3- 3-5 people 4- 6-10 people 5- More than 10 people
HRTBS_11	1>0 2>1 3>2 4>3 5>4 6>5	1- No regular partner/no penetrative sex 2- Every time 3- Often 4- Sometimes 5- Rarely 6- Never	0- No regular partner/no penetrative sex 1- Every time 2- Often 3- Sometimes 4- Rarely 5- Never
HRTBS_12	1>0 2>1	1- No casual partner/no penetrative sex	0- No casual partner/no penetrative sex

	3>2 4>3 5>4 6>5	2- Every time 3- Often 4- Sometimes 5- Rarely 6- Never	1- Every time 2- Often 3- Sometimes 4- Rarely 5- Never
HRTBS_13	1>0 2>1 3>2 4>3 5>4 6>5	1- No paid sex/no penetrative sex 2- Every time 3- Often 4- Sometimes 5- Rarely 6- Never	0- No paid sex/no penetrative sex 1- Every time 2- Often 3- Sometimes 4- Rarely 5- Never
HRTBS_14	1>0 2>1 3>2 4>3 5>4 6>5	1- No times 2- One time 3- Two times 4- 3-5 times 5- 6-10 times 6- More than 10 times	0- No times 1- One time 2- Two times 3- 3-5 times 4- 6-10 times 5- More than 10 times
HRTBS_15	1>0 2>1 3>2 4>3 5>4 6>5	1- Hasn't hit up 2- Once a week or less 3- More than once a week (but less than once a day) 4- Once a day 5- 2-3 times a day 6- More than 3 times a day	0- Hasn't hit up 1- Once a week or less 2- More than once a week (but less than once a day) 3- Once a day 4- 2-3 times a day 5- More than 3 times a day
HRTBS_16	1>0 2>1 3>2 4>3 5>4 6>5	1- No times 2- One time 3- Two times 4- 3-5 times 5- 6-10 times 6- More than 10 times	0- No times 1- One time 2- Two times 3- 3-5 times 4- 6-10 times 5- More than 10 times
HRTBS_17	1>0 2>1 3>2 4>3 5>4 6>5	1- None 2- One person 3- Two people 4- 3-5 people 5- 6-10 people 6- More than 10 people	0- None 1- One person 2- Two people 3- 3-5 people 4- 6-10 people 5- More than 10 people
HRTBS_18	1>0 2>1 3>2 4>3 5>4 6>5	1- No times 2- One time 3- Two times 4- 3-5 times 5- 6-10 times 6- More than 10 times	0- No times 1- One time 2- Two times 3- 3-5 times 4- 6-10 times 5- More than 10 times
HRTBS_19	1>0 2>1 3>2	1- Does not reuse 2- Every time 3- Often	0- Does not reuse 1- Every time 2- Often

	4>3 5>4 6>5	4- Sometimes 5- Rarely 6- Never	3- Sometimes 4- Rarely 5- Never
HRTBS_20	1>0 2>1 3>2 4>3 5>4 6>5	1- Does not reuse 2- Every time 3- Often 4- Sometimes 5- Rarely 6- Never	0- Does not reuse 1- Every time 2- Often 3- Sometimes 4- Rarely 5- Never
TAPS_21 TAPS_22 TAPS_23 TAPS_24	1>0 2>1 3>2 4>3 5>4	1- Never 2- Once or twice 3- Monthly 4- Weekly 5- Daily or almost daily	0- Never 1- Once or twice 2- Monthly 3- Weekly 4- Daily or almost daily
ATTPLWHA4 (Reverse coded into same variable)	1>5 2>4 3>3 4>2 5>1	1- Strongly disagree 2- Disagree 3- Neutral 4- Agree 5- Strongly Agree	5- Strongly disagree 4- Disagree 3- Neutral 3- Agree 1- Strongly Agree
ATTHIVRX14 (Reverse coded into same variable)	1>5 2>4 3>3 4>2 5>1	1- Strongly disagree 2- Disagree 3- Neutral 4- Agree 5- Strongly Agree	5- Strongly disagree 4- Disagree 3- Neutral 3- Agree 1- Strongly Agree
SOCMED2 (Recoded into same variable)	1>0 2>1 3>2 4>3 5>4 6>5	1- None 2- One 3- Two 4- 3-5 accounts 5- 6-10 accounts 6- More than 10 accounts	0- None 1- One 2- Two 3- 3-5 accounts 4- 6-10 accounts 5- More than 10 accounts
SOCMED4 (Recoded into same variable)	1>0 2>1 3>2 4>3 5>4	1- No impact 2- Minimal impact 3- Some impact 4- High impact 5- Very high impact	0- No impact 1- Minimal impact 2- Some impact 3- High impact 4- Very high impact
UVPS_9 UVPS_9A UVPS_9B UVPS_9C UVPS_9D UVPS_9E	1>1 2>0	1- Yes 2- No	1- Yes 0- No
PCP3 (Recoded into same variable)	1>0 2>1 3>2 4>3 5>4	1- Extremely dissatisfied 2- Dissatisfied 3- Neutral 4- Satisfied 5- Extremely Satisfied	0- Extremely dissatisfied 1- Dissatisfied 2- Neutral 3- Satisfied 4- Extremely Satisfied

COMPUTED VARIABLES			
PHQ_4_ANX		PHQ_4A + PHQ_4B	Range 0-4
PHQ_4_DEP		PHQ_4C + PHQ_4D	Range 0-4
HRPS_SCORE		SUM(HRPS_2,HRPS_3,HRPS_4,HRPS_5 ,HRPS_6,HRPS_7,HRPS_8,HRPS_9)	Range 8-47
HRTBS_SEX		SUM(HRTBS_10,HRTBS_11,HRTBS_12, HRTBS_13,HRTBS_14) **IF HRTBS_10 = 1**	Range 0-25
HRTBS_DRUGS		SUM(HRTBS15,HRTBS_16,HRTBS_17, HRTBS_18,HRTBS_19,HRTBS_20) **IF HRTBS_15 = 1**	Range 0-30
HRTBS_SCORE		SUM(HRTBS_10,HRTBS_11,HRTBS_12, HRTBS_13,HRTBS_14,HRTBS15,HRTB S_16,HRTBS_17,HRTBS_18,HRTBS_19, HRTBS_20) **IF HRTBS_10 =1 and/or HRTBS_15 = 1**	Range 0-55
HRTBS_SEXALL		SUM(HRTBS_10,HRTBS_11,HRTBS_12, HRTBS_13,HRTBS_14) for all cases	Range 0-25
HRTBS_DRUGSALL		SUM(HRTBS15,HRTBS_16,HRTBS_17, HRTBS_18,HRTBS_19,HRTBS_20) for all cases	Range 0-30
HRTBS_SCOREALL		SUM(HRTBS_10,HRTBS_11,HRTBS_12, HRTBS_13,HRTBS_14,HRTBS15,HRTB S_16,HRTBS_17,HRTBS_18,HRTBS_19, HRTBS_20) for all cases	Range 0-55
TAPS_SCORE		SUM(TAPS_21,TAPS_22,TAPS_23,TAP S_24)	Range 0-16
ATTPLWHA_SCORE		SUM(ATTPLWHA1, ATTPLWHA2, ATTPLWHA3, ATTPLWHA4, ATTPLWHA5, ATTPLWHA6, ATTPLWHA7, ATTPLWHA8, ATTPLWHA9)	Range 9-45
ATTHIVRX_PREV_AVG		MEAN(ATTHIVRX10, ATTHIVRX11,ATTHIVRX12)	Range 1-5
ATTHIVRX_NEC_AVG		MEAN(ATTHIVRX13, ATTHIVRX14,ATTHIVRX15)	Range 1-5
PSS_SCORE		SUM(PSS1,PSS2,PSS3,PSS4,PSS5,PSS6)	Range 6-30
UVPS_SCORE		SUM(UVPS_9A,UVPS_9B,UVPS_9C,UV PS_9D,UVPS_9E)	Range 0-5
CATEGORIZED/RECODED VARIABLES			
Variable Name	Code	Treatment	New categories
PHQ_4_ANX_CAT	0>0 1>0 2>0	PHQ_4_ANX ≥3 or <3	1 – pos 0 – neg

	3>1 4>1		
PHQ-4_DEP_CAT	0>0 1>0 2>0 3>1 4>1	PHQ_4_DEP ≥3 or <3	1– pos 0 – neg
UVPS_CATSCORE	0>0 1>0 2>0 3>0 4>1 5>1	UVPS_SCORE ≥4 or <4	1– abused 0 – not abused
ATTHIVRX_AVG_PREVCAT	0-3.99>0 4-5>1	ATTHIVRX_PREV_AVG ≥4 or <4	1 – positive attitude 0– negative attitude
ATTHIVRX_AVG_NEC_CAT	0-3.99>0 4-5>1	ATTHIVRX_NEC_AVG ≥4 or <4	1 – positive attitude 0– negative attitude
TAPS_21_CAT Tobacco	0>0 1>1 2>2 3>2 4>2	TAPS_21=1 or <1; ≤2 or <2	2 – SUD 1 – problem use 0 – no problem
TAPS_22_CAT Alcohol	0>0 1>1 2>2 3>2 4>2	TAPS_22=1 or <1; ≤2 or <2	2 – SUD 1 – problem use 0 – no problem
TAPS_23_CAT Illicit/illegal drugs	0>0 1>1 2>2 3>2 4>2	TAPS_23=1 or <1; ≤2 or <2	2 – SUD 1 – problem use 0 – no problem
TAPS_24_CAT Prescription use	0>0 1>1 2>2 3>2 4>2	TAPS_24=1 or <1; ≤2 or <2	2 – SUD 1 – problem use 0 – no problem
QOL_CAT	1>0 2>0 3>1	QOL≤3or <3	1 - good 0 – not good

	4>1 5>1		
PCP2_CAT	1>0 2>0 3>0 4>1 5>1	PCP2≤4or <4	1 – agree 0 - disagree
PCP3_CAT	0>0 1>0 2>0 3>1 4>1	PCP2≤3or <3	1 – satisfied 0 - dissatisfied
COMMATT5_CAT	1>0 2>0 3>0 4>1 5>1	COMMATT5≤4or <4	1 – agree 0 - disagree
COMMATT6_CAT	1>0 2>0 3>0 4>1 5>1	COMMATT6≤4or <4	1 – agree 0 - disagree
COMMATT7_CAT	1>0 2>0 3>0 4>1 5>1	COMMATT7≤4or <4	1 – agree 0 - disagree
COMMATT8_CAT	1>0 2>0 3>0 4>1 5>1	COMMATT8≤4or <4	1 – agree 0 - disagree
NBRHD9_CAT	1>0 2>0 3>0 4>1 5>1	NBRHD9_CAT≤4or <4	1 – agree 0 - disagree
NBRHD10_CAT	1>0 2>0 3>0 4>1 5>1	NBRHD10_CAT≤4or <4	1 – agree 0 - disagree
NBRHD11_CAT	1>0 2>0 3>0 4>1	NBRHD11_CAT≤4or <4	1 – agree 0 - disagree

	5>1		
NBRHD12_CAT	1>0 2>0 3>0 4>1 5>1	NBRHD12_CAT≤4or <4	1 – agree 0 - disagree
NBRHD913_CAT	1>0 2>0 3>0 4>1 5>1	NBRHD13_CAT≤4or <4	1 – agree 0 - disagree
ATTUU16_CAT	1>0 2>0 3>0 4>1 5>0	ATTUU16≤4or <4	1 – completely accurate 0 – not accurate
ATTUU17_CAT	1>1 2>0 3>0 4>0 5>0	ATTUU17=1or >1	1 – no risk 0 – risk
ATTUU18_CAT	1>0 2>0 3>0 4>1 5>1	ATTUU18≤4or <4	1 – likely 0 – unlikely

Binary Variables changed in regression analysis			
Variable Name	Question	Code	Recode
CURR_WORK	Currently working?	Yes =1 No = 2	Yes = 1 No = 0
BIRTH	Country born?	U.S. = 1 Outside U.S. = 2	U.S. = 1 Outside U.S. = 0
HIV_TEST	Ever received HIV test?	Yes = 1 No = 2	Yes = 1 No = 0
HIV_STAT	Ever told have HIV?	Yes = 1 No = 2	Yes = 1 No = 0
ART_STAT	Currently taking ART?	Yes = 1 No = 2	Yes = 1 No = 0

PrEP	Ever prescribed PrEP?	Yes = 1 No = 2	Yes = 1 No = 0
UUAWARE	Heard about U=U prior?	Yes = 1 No =2	Yes = 1 No = 0
PROXHIV7	Have family with HIV?	Yes = 1 No = 2	Yes = 1 No = 0
PROXHIV8	Have friend with HIV?	Yes = 1 No = 2	Yes = 1 No = 0
PCP1	Have a PCP?	Yes = 1 No = 2	Yes = 1 No = 0
Unchanged Variables			
PCP4	Commute to PCP?	<30 mins = 1 30-59 mins = 2 60+ mins = 3 Unknown = 4	
SOCMED3	Time spent on social media?	<30 mins = 1 30-60 mins = 2 1-2 hours = 3 2-3 hours = 4 More than 3 hours = 5	

CURRICULUM VITA

Roberta Thimbriel is from Belize, Central America. She has been a Life and Biomedical Science educator at the secondary and post-secondary levels for over 10 years. She completed graduate degrees in Secondary Education from the University of North Florida in 2006 and in Clinical Laboratory Science (CLS) from Idaho State University in 2014. She is certified as a Medical Laboratory Scientist (MLS) by the American Society for Clinical Pathology (ASCP). Her thesis toward completion of the MS in CLS was entitled "A Study on Prevalence of Iron Deficiency Anemia in School Aged Children 5 - 12 Years Old in Belize."

She started the Interdisciplinary Health Sciences Ph.D. program at the University of Texas at El Paso (UTEP) in August 2018. She was a Graduate Research Associate (GRA) in the Immunodiagnostic and Chagas Disease laboratories in her first year. She continued her GRA at the Minority AIDS Research Center (MARC) at UTEP until July 2022, where she collaborated in community-engaged research addressing health disparities among racial/ethnic minorities.

Roberta was the recipient of the Dodson Research Grant from the UTEP Graduate School and the International Peace Scholarship from P.E.O. International. She has had collaborative abstracts accepted at conferences held by the American Public Health Association and the Society for Public Health Education, one recently by the Council for Exceptional Children Conference. She also has an article entitled "COVID-19 Stress, Resilience, and Job Loss Concerns in People with Chronic Conditions and Disabilities," with co-authors Bilal Urkmez, Beatrice Lee and Emre Umucu, that has been accepted for publication in the Journal of Vocational Rehabilitation (2022).

Email: vasquez336782@gmail.com

This dissertation was typed by Roberta Thimbriel