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Occupational Health Outcomes in Women Living with and at risk for HIV

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OCCUPATIONAL HEALTH OUTCOMES IN WOMEN LIVING WITH AND AT RISK FOR HIV

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ABSTRACT

Women living with HIV (WLWH) are now able to work and need to work to attain the fruitful benefits of employment. Regardless of the need for income, employment provides esteem, confidence, structure, social support, and is associated with improved physical and psychological outcomes. Yet, in spite of the documented benefits associated with employment, an estimated 60% of WLWH are not employed. Thus, occupational disparities among WLWH contribute to disparities in health and quality of life among this population. While the historical trajectory of HIV is unique compared to other populations with chronic disease, evidence suggests that gender-specific difference in socioeconomic, psychosocial, and health-related contexts influence employment acquisition and occupational productivity among WLWH. Yet, the mechanisms by which these contexts influence employment in WLWH is largely unknown. Therefore, the purpose of this dissertation was to examine the relationships between socioeconomic, psychosocial, and health-related contexts and employment and occupational productivity in WLWH. To add depth and breadth of understanding surrounding these contexts, both quantitative and qualitative methodologies were included. This dissertation presents the: (1) Background and significance of the research problem; (2) review of the literature surrounding employment and occupational productivity among WLWH; (3) research methodology and design used for this dissertation; and (4) three manuscripts

documenting the results and implications of this research. Manuscript 1, *Employment and Occupational Productivity among Women Living with HIV: A Conceptual Framework,* enhances utility of the literature by presenting a conceptual framework of the comprehensive contexts influencing employment and occupational productivity among WLWH. Manuscript 2, *Socioeconomic, Psychosocial, and Health-Related Contexts Associated with Employment among Women Living with HIV and Women at Risk for HIV in the United States*, presents the associations between socioeconomic, psychosocial, and health-related contexts and employment, and provides important implications related to impact of employment on HIV-specific outcomes. Finally, Manuscript 3, *A Mixed-Methods Study Understanding the Psychosocial Context of Employment and Occupational Productivity among Women Living with HIV in the Southern United States*, presents the triangulated results of quantitative and qualitative methodologies aimed to elucidate the contexts influencing occupational productivity and the experience of employment among employed WLWH.

Keywords: HIV, Employment, Occupational Productivity, Cohort Study, Health

DEDICATION

I dedicate this dissertation to my children, Iliana Wise Scholl (age 11) and Lukas Wise Scholl (age 8). It is my most sincere desire that you realize your own ability to change the world for the better. Your patience and support in the completion of this endeavor is remarkable. I love and appreciate you both.

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future. Finally, to my friends and family, of which there are too many to name, I literally could not have accomplished this dissertation without your love and support. You have shaped me, motivated me, and sacrificed beside me to help me accomplish this goal. I will forever be appreciative.

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INTRODUCTION

REVIEW OF LITERATURE

EMPLOYMENTAND OCCUPATIONAL PRODUCTIVITY AMONG WOMEN LIVING WITH HIV: A CONCEPTUAL FRAMEWORK

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency syndrome
β	standardized beta coefficient
BMI	body-mass index
cART	combination antiretroviral therapy
CDC	Center for Disease and Control
CES-D	Center for Epidemiologic Studies-Depression Questionnaire
FDA	Food and Drug Administration
HAART	highly active antiretroviral therapy (HAART)
HIV	Human Immunodeficiency Syndrome
p	statistical significance
Prevention	Centers for Disease Prevention and Control
SD	standard deviation
WIHS	Women's Interagency HIV Study
UAB	University of Alabama at Birmingham
U.S.	United States

DEFINITIONS

Abuse: Abuse describes physical violence from another person (i.e., slapped, hit, punched, kicked).

Adherence: Adherence describes how often antiretrovirals were taken as prescribed.

Anxiety: Anxiety refers to the level of symptoms reflective of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria for General Anxiety Disorder (GAD) as measured by the GAD-7 scale (Spitzer, Kroenke, Williams, & Lowe, 2006).

Coding: Coding is described as the inductive organization of emerging themes into categories (Creswell, 2018)

Data Saturation: Data saturation reflects the point during qualitative data analysis in data redundancy occurs and no further themes emerge (Saunders et al., 2017).

Concurrent Mixed Methods Research: Concurrent mixed methods research describes the research design and study procedures where quantitative and qualitative data are purposefully collected and holistically analyzed to provide comprehensive address the research problem (Plano Clark, 2016). In concurrent mixed methods research, the point of integration occurs in the interpretation of the overall results (Plano Clark, 2016).

Depressive Symptoms: Depressive symptoms refers to depressive mood as measured by the Center for Epidemiological Studies-Depression (CES-D) Scale. A score of sixteen or greater identifies individuals who should be screened clinically for depression (Radloff, 1977).

Employment: Employment describes the number of hours worked per week or month.

Empowerment: Empowerment reflects the ability to "access skills and resources to cope more effectively with current as well as future stress and trauma" as measured by the Personal Progress Scale-Revised (Johnson, Worell, & Chandler, 2005).

Housing Security: Housing security describes the housing type and duration of residence.

Occupational Productivity: Occupational productivity describes the level of presenteeism at work as measured by the Stanford Presenteeism Scale-6.

Perceived Stress: Perceived stress describes "the degree to which situations in one's life are appraised as stressful" and is measured by the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983).

Physical Health: For the purpose of this study, physical health is described in HIV-specific context (i.e., level of bodily pain experienced in the past four weeks, HIV-associated neurocognitive disorders (HAND) score, HIV-viral load, and CD4 count.

Presenteeism: Presenteeism is described as "decreased productivity or below-normal" production quality while at work as measured by the Stanford Presenteeism Scale-6 (Koopman et al., 2002).

Psychological Well-being: Psychological well-being is described the quality of life in people living with HIV including health-related distress, cognitive functioning, energy/fatigue, role function, and social function as measured by the MOS-HIV Scale (Henderson et al., 2010).

Qualitative Code Book: Qualitative code book describes a record of the codes, whether consistent or changing, the researcher uses to code qualitative data (Creswell, 2018).

Social Support: Social support refers to the degree to which interpersonal relationships provide functional support (i.e., emotional support, instrumental support, information support, appraisal support, and social companionship) (Sherbourne & Stewart, 1991).

Stigma: Stigma describes the internalization or "acceptance of stigmatizing beliefs that are present in the community", including feels of shame with lower self-worth and self-imposed social rejection as a consequence (Turan et al., 2016).

Thematic Analysis: Thematic analysis describes the use of induction to identify and organize emerging themes from qualitative data (Creswell, 2018).

Hermeneutic Phenomenology: Hermeneutic Phenomenology is a type of qualitative data analysis that describes the interpretation of and meaning attributed to a phenomenon considering the full context of the individual's lived experience (Wojnar & Swanson, 2007).

Utilization of Services: Utilization of services describes how many times in the past six months: HIV care visits were missed without rescheduling.

CHAPTER 1

INTRODUCTION

With proper disease management, people living with HIV (PLWH) are now able to work and need to work in order to secure the numerous physical, psychological, and economic benefits that accompany employment (Degroote, Vogelaers, & Vandijck, 2014; Gómez et al., 2016; Medicine, 2010; Vance, Cody, Yoo-Jeong, Jones, & Nicholson, 2015; Wagener et al., 2014). Yet, in spite of the increased ability to work, approximately 60% of PLWH are not employed, creating disparities in the many benefits associated with employment (Conyers, 2011; Institute of Medicine, 2010; Rabkin, McElhiney, Ferrando, Van Gorp, & Lin, 2004). Women living with HIV (WLWH) are particularly vulnerable to poor employment outcomes, are less likely to be hired, and are more likely to lose their jobs, compared to men living with HIV (Dray-Spira, Gueguen, & Lert, 2008). Evidence suggests that gender-based differences in socioeconomic and psychosocial contexts influence these disparities among PLWH (Bielecky et al., 2015; Bokma, Batelaan, van Balkom, & Penninx, 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin, Lemyre, & Corneil, 2013; Karlsson, Björklund, & Jensen, 2010; Macsinga, Sulea, Sarbescu, Fischmann, & Dumitru, 2015; McGregor, Iverson, Caputi, Magee, & Ashbury, 2014; van Scheppingen et al., 2013; van Servellen, Aguirre, Sarna, & Brecht, 2002; Varekamp, Verbeek, De Boer, & Van Dijk, 2011) Yet, the mechanisms by which socioeconomic, psychosocial, and health contexts influence employment in WLWH is largely unknown.

Among people living with other chronic diseases (i.e., diabetes, hypertension, arthritis, etc.), fear of losses in occupational productivity influence hiring decisions and job maintenance (Leonardi & Scaratti, 2018; Louvet, 2007). While productivity loss can occur through decreased quantity or quality of work production, gender-based differences in socioeconomic and psychosocial contexts may influence productivity loss among WLWH (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Macsinga et al., 2015; McGregor et al., 2014; Unanue, Gomez, Cortez, Oyanedel, & Mendiburo-Seguel, 2017; van Scheppingen et al., 2013; van Servellen et al., 2002; Varekamp et al., 2011). Understanding the comprehensive contexts influencing employment and occupational productivity in WLWH is critical to alleviating occupational disparities among this population. Therefore, the purpose of this dissertation was to examine the relationships between socioeconomic, psychosocial, and health-related contexts, employment, and occupational productivity among WLWH. The purpose of this chapter is to briefly introduce: (a) background and significance of occupational disparities in women living with HIV; (b) the research problem; (c) study purpose; (d) theoretical and conceptual framework; (e) study design and methods (e) specific aims and research hypothesis; and (h) study assumptions and limitations.

Background and Significance

Over the past two decades, HIV has transitioned from a disabling, death sentence to a chronic, manageable illness (Marcus et al., 2016; McGoldrick, 2012; Medicine, 2010). Tremendous advances in HIV care have demonstrated improved efficacy in viral

suppression, and tolerability of medication required for chronic disease management (Desai, Iyer, & Dikshit, 2012; Marcus et al., 2016; McGoldrick, 2012; McGregor, Iverson, Caputi, Magee, & Ashbury, 2014; Medicine, 2010). Thus, many PLWH are not only able to return or begin to work; they and need to work to provide structure and income over their newly expanded life spans (McGoldrick, 2012). Recognizing this change, the Social Security Administration amended the criteria for HIV-related disability in January 2017 to reflect the chronic, manageable nature of the illness (Rice, 2017). in spite of this change, employment rates among PLWH still hover around 35% (Adimora et al., 2018; Conyers, 2011; Institute of Medicine, 2010; Rabkin, McElhiney, Ferrando, Van Gorp, & Lin, 2004). Gender-based disparities also exist among PLWH, with WLWH being particularly vulnerable to poor occupational outcomes (Dray-Spira et al., 2008; Foundation, 2007; Leineweber et al., 2012; R. Dray-Spira, 2007).

Occupational disparities among PLWH are particularly concerning, as employment is now recognized as a social determinant of health (NIOSH, 2017). For PLWH, employment may be particularly beneficial in countering the negative contexts associated with HIV (i.e., impaired physical health, psychological health, and cognition) and is even associated with improved HIV-outcomes (Degroote et al., 2014; Vance et al., 2015; Wagener et al., 2014). Further, employment not only influences individual health, it extends its benefits to the familial and community levels (Kaori Fujishiro, 2017). Therefore, understanding the comprehensive contexts influencing occupational outcomes is critical to not only improved personal (i.e., socioeconomic, psychosocial, and health-related outcomes), but improvements in the economy and society itself.

The evidence suggests that among PLWH who are employed, productivity at work may be impaired, influencing job maintenance (The Henry J. Kaiser Family Foundation, 2007; Leineweber et al., 2012; R. Dray-Spira, 2007; Verbooy et al., 2018). However, the comprehensive contexts influencing occupational productivity, and thus, job maintenance, among PLWH is largely undocumented outside of the contexts of health. Particularly in the era where viral suppression is possible, a more holistic consideration of the contexts influencing occupational productivity is warranted (i.e., socioeconomic, psychosocial, and health context) (Garrow, 2016; Gosselin et al., 2013). The literature suggests that WLWH may be particularly vulnerable to poor employment outcomes due to gender-based differences in socioeconomic and psychosocial contexts influencing employment and occupational productivity (i.e., depression, stress, social support, and empowerment) (Bielecky et al., 2015; Bokma, Batelaan, van Balkom, & Penninx, 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson, Björklund, & Jensen, 2010; Macsinga, Sulea, Sârbescu, Fischmann, & Dumitru, 2014; McGregor et al., 2014; van Scheppingen et al., 2015; van Servellen, Aguirre, Sarna, & Brecht, 2002; Varekamp, Verbeek, De Boer, & Van Dijk, 2011). However, there are notable gaps in the literature highlighting the mechanisms for employment and occupational productivity among women living with HIV.

Understanding the comprehensive contexts influencing employment and occupational productivity among WLWH is critical to the development of future interventions and policy to improve self-efficacy, quality of life, and health-related outcomes among WLWH. In addition, with over a quarter million women living with

HIV in the United States (CDC, 2017), understanding these links is likely to yield substantial social and economic benefit.

Research Problem

Women living with HIV have low employment rates, and evidence suggests those that are employed have lower occupational productivity than their healthy counterparts. Based on the burden of HIV-infection and occupational disparities among WLWH in the United States, the total benefit of employment to the individual and society, and the prioritization of employment as a social determinant of health (NIOSH, 2017), the examination of employment among WLWH is highly warranted.

Study Purpose

This dissertation contributed to rectifying the aforementioned problem by comprehensively examining the relationships between socioeconomic, psychosocial, and health-related contexts, and employment and occupational productivity among WLWH. To add breadth and depth of understanding of these contexts, this dissertation also explored the comprehensive contexts influencing the experience of employment among employed WLWH. Based on the literature, and the research problem, the purpose of this dissertation was relevant and warranted to address occupational disparities in WLWH.

Theoretical Guidance and Conceptual Framework

The Transactional Model of Stress and Coping guided this study's design and interpretation (Lazarus, 1984).The model's central tenet includes that socioeconomic and

personal contexts (i.e., psychosocial and health-related contexts, and personal traits) influence the ability of individuals to navigate the environment, and inability to adapt to the environment (through problem solving or emotional coping) results in stress. For the purposes of this dissertation, the model was modified to explain the influence of socioeconomic and personal contexts on employment and occupational productivity in WLWH (See Figure 1). Based on the review of the literature (to be discussed in greater detail in Chapter Two), contexts suggested to influence employment and occupational productivity in WLWH were selected a priori for further examination. Socioeconomic contexts selected included: Age, race, education, relationship status, housing security, and childcare responsibilities. Personal contexts selected included: Physical health, psychological health (depression, anxiety, perceived stress, internalized HIV-stigma, and cognitive function), social support, exposure to abuse, and empowerment.

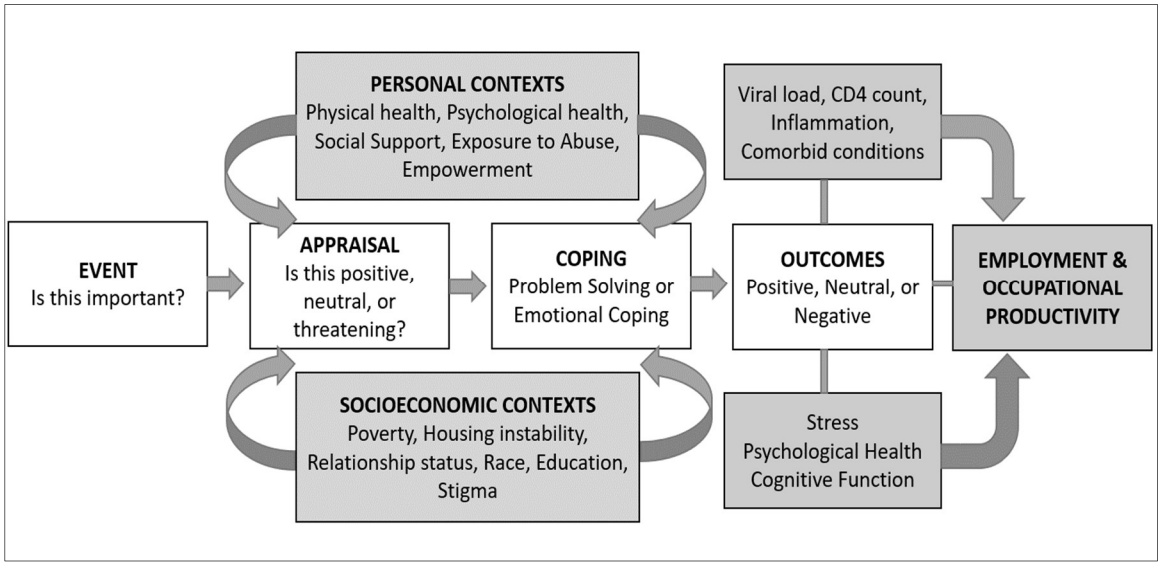

Figure 1. Adapted Model of Stress and Coping. Note: Adapted from "Stress, appraisal, and coping" by R.S. Lazarus and S. Folkman, 1984. Copyright 1984 by Springer Publishing Company. Adapted with permission.

Study Design and Methods

A concurrent mixed methods design was selected for its usefulness in comparing and triangulating data to better inform interventions and policy to improve employment, occupational productivity, and the socioeconomic, psychosocial, and health-related outcomes among WLWH. Ancillary, cross-sectional data analysis was used to examine the relationships between socioeconomic, psychosocial, and health-related contexts and employment and occupational productivity among WLWH and WARH Qualitative interviews were conducted in a sub-set of employed WLWH to add richness of description of the lived experience of employment; and the socioeconomic, psychosocial, and health-related contexts influencing employment among WLWH.

This research was facilitated by collaboration with the Women's Interagency HIV Study (WIHS). WIHS represents the largest prospective cohort study of WLWH and WARH the United States and is representative of the adult, female population living with HIV in the United States (Adimora et al., 2018; Johns Hopkins School of Public Health, n.d.). The overall aim of WIHS is the comprehensive investigation of the impact of HIV infection in women (Johns Hopkins School of Public Health, n.d.). Participants undergo comprehensive study visits every six months including socioeconomic, psychosocial, clinical evaluation (Johns Hopkins School of Public Health, n.d.). Through this collaboration, the research problem was feasible and appropriate in scope for a PhD dissertation. The tools and instruments that guided data collection through WIHS were appropriate for use both in context of the research problem identified and in the population of interest for this study.

Specific Aims and Research Hypotheses

To best address the research problem and the purpose of this dissertation, the specific aims of the research included:

SA1: Examine the relationships between socioeconomic, psychosocial characteristics, and health-related context and employment in WLWH and WARH.

H1: Socioeconomic, psychosocial, and health-related context will influence the difference in employment in WLWH and WARH.

SA2: Examine the relationships between employment and HIV-specific outcomes in WLWH.

H2: HIV-related outcomes will differ by employment status among WLWH.

SA3: Examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV.

H3: Socioeconomic, psychosocial, and health-related context will influence the difference in occupational productivity in employed women living with HIV.

SA4: Explore the lived experience, contexts surrounding, and meaning attributed to employment for women living with HIV.

Study Assumptions

Certain assumptions exist which contributed to the design of this study, and the ability to validly interpret study findings. Assumptions of this study included:

1. Socioeconomic, psychosocial, and health-related contexts may impact employment status in WLWH and WARH.

2. Psychological well-being, physical health, social support, and empowerment may impact occupational productivity in WLWH

3. Participants will provide honest responses during interviews and in response to study questionnaires.

4. Data will be entered accurately.

Limitations

Limitations of this research included that the research design does not allow causal inference. However, this research design was appropriate considering the minimal evidence in the literature addressing the influence of socioeconomic and psychosocial contexts on employment and productivity in WLWH. A second limitation in this research is that although WIHS participants are representative of the adult, female, HIV-infected population in the United States, aim three and four was conducted using a limited sub-set of the total WIHS population. WIHS participants across four WIHS sites in the Southern United States facilitated the examination of these aims. Although this limitation decreased generalizability of findings to the rest of the United States, this adds meaningful contexts to the unique contexts influencing employment in the epicenter of the HIV-epidemic in the U.S. Moreover, the evidence suggests that there are socioeconomic and psychosocial barriers in the Southern United States, which may exacerbate occupational, psychosocial, and health disparities and, therefore, warrant specific investigation.

Summary

As HIV has transitioned into a chronic, manageable disease, PLWH now realize substantial benefit from participation in the workforce. However, disparities exist based on HIV-status and gender, which prevent the acquisition of critical benefits, impacting the individual, the economy, and society. WLWH are particularly vulnerable to poor employment outcomes. Based on the impact of employment and burden of HIV infection in women living in the United States, research reducing occupational disparities is warranted and necessary.

The purpose of this chapter was to describe the background, significance, problem, and research aims that will guide this three-paper dissertation. The following chapters will provide a synthesis of the literature relevant to the research problem, a rigorous description of the research design and methodology chosen to explore research aims, and present findings, inferences, and implications pertinent to the analysis of this research. More specifically, the three papers presented as part of this dissertation will synthesize the results of this dissertation. The first paper will present the review of the literature, and the relationships between the socioeconomic, psychosocial, and health-related contexts influencing employment and occupational productivity in women living with HIV (WLWH). A conceptual framework will be presented to synthesize the literature and elucidate the mechanisms by which socioeconomic and psychosocial contexts influence employment and occupational productivity in WLWH. The second paper will discuss the results of the quantitative aims one and two, which examined the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH. Women at risk for HIV (WARH) were included in this analysis to allow for the

inference of the impact of HIV compared to the impact of the socioeconomic and psychosocial contexts frequently associated with HIV-infection. The third paper will discuss quantitative aim three, which examined the relationships between socioeconomic, psychosocial, and health-related context on occupational productivity in WLWH. Further, this paper will present the qualitative findings of interviews, which add breadth and depth to the understanding of the comprehensive contexts influencing the experience of employment for WLWH. The final chapter will discuss the integrated conclusions of this mixed methods research study, and provide implications pertaining to the results of the three papers, in terms of future research, practice, and policy.

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CHAPTER TWO
REVIEW OF THE LITERATURE

The purpose of this literature review is to provide the background, significance, and state of the science of employment and occupational productivity in women living with HIV(WLWH). Specifically, this review will present the personal and socioeconomic mechanisms, which may influence employment and occupational productivity as documented in the literature over the last decade. Gaps in the current literature, and particularly those necessary to promote effective interventions to improve personal and occupational outcomes in women living with HIV will be discussed. To this end, Chapter 2 will present: (1) epidemiological basis of the concepts of interest surrounding the research problem; (2) literature search strategy and synthesis of the current evidence; (3) theoretical framework guiding the study; (4) study design and methods selected; and (5) ethical issues related to the population/sample.

Epidemiological Basis of Concepts of Interest

Human Immunodeficiency Virus Therapy and its Impact on Employment

Human Immunodeficiency virus (HIV) is a chronic disease, transmitted through blood and bodily fluids, requiring complex medical management including careful adherence to antiretroviral therapies, and the treatment or symptom management of frequently occurring co-morbidities (i.e., fatigue, pain, depression, anxiety) (Braitstein et al., 2005). Without adherence to therapy, HIV-infection will typically progress to

Acquired Immunodeficiency syndrome (AIDS), the most severe and fatal form of HIV-infection (Prevention). When HIV debuted in the United States in 1981, it was considered a fatal disease, with a life expectancy of approximately three years once the virus progressed to AIDS. Due to the nature of viral progression, and the lack of availability of effective medicines to control viral replication, unemployment and disability were considered a natural course post diagnosis.

In 1996, the tables began to shift, slowly, as the first combination antiretroviral therapy (ART) drugs were approved by the FDA (Henry J Kaiser Family Foundation, 2018). However, the first regimens were tedious to adhere to, consisting of multiple doses a day, and leaving people not only with the symptoms of HIV itself, but the exhaustive side effects of the medicine, including hepatic and pancreatic toxicities (Aldir, Horta, & Serrado, 2014; Institute of Medicine, 2010). Employment remained difficult due to the complex management of the virus and the side effects of the medications necessary to preserve life.

In 2006, Atripla® was approved - the first highly active antiretroviral therapy (HAART) - which allowed a once a day therapy with a substantially improved side effect profile (Aldir et al., 2014). With prompt diagnosis and adherence to care, HIV-related morbidity, mortality, and transmission could now be controlled (Aldir et al., 2014). HAART provided the ability for people living with HIV (PLWH) to live with a sense of normalcy - allowing for enhanced longevity and quality of life. (Desai, 2012).

Today, there are 1.1 million people in the United States (U.S.) living with HIV(Centers for Disease Control and Prevention). What was originally considered a death sentence is now considered a chronic, manageable disease. With this transition,

PLWH are now able to work and are now given the opportunity to work considering an average life expectancy of 73 years (Institute of Medicine, 2010; Marcus et al., 2016). To recognize this transition, the Social Security Administration amended the HIV-related disability criteria in 2010 to reflect the chronic, manageable nature of the disease (Institute of Medicine, 2010).

Employment

Employment is important to overall well-being as it leads to income, increased structure, socialization, self-identity, and purpose. In PLWH, employment is associated with better physical and mental health (Degroote, Vogelaers, & Vandijck, 2014; Vance, Cody, Yoo-Jeong, Jones, & Nicholson, 2015; Wagener et al., 2014) and has been linked to higher medication adherence, lower viral loads, and higher CD4 counts (Gómez et al., 2016). Yet, people living with chronic disease, including HIV, experience a substantially lower employment rate than the general population (R. Dray-Spira, 2007). Although modern medicine has provided the ability for PLWH to work, and the benefits of employment are well documented, employment rates for PLWH hover around approximately 35% (Adimora et al., 2018; Conyers, 2011; Institute of Medicine, 2010; Rabkin et al., 2004). Women living with HIV (WLWH) are particularly vulnerable, and are both less likely to be employed and more likely to lose their job compared to men living with HIV (Dray-Spira et al., 2008). This disparity may be related to occupational productivity, which influences job maintenance.

Occupational Productivity

Personal and socioeconomic context can influence occupational productivity (Garrow, 2016; Gosselin, Lemyre, & Corneil, 2013; Hafner, 2012; Okechukwu, Souza, Davis, & De Castro, 2014). Although occupational productivity can be measured in terms of absenteeism or objective product outcome measures, this dissertation will examine occupational productivity through the lens of presenteeism- or self-reported "decreased productivity" while at work (Koopman et al., 2002). Evidence supports that personal factors that have substantially contributed to presenteeism include gender, depression, anxiety, inter-personal violence, inadequate social support, and perceived stress (Garrow, 2016; Gosselin et al., 2013; Hafner, 2012). Notably, WLWH are disproportionately burdened with depression and anxiety, and demonstrate greater psychological distress than their male counterparts (Do et al., 2014; Liu et al., 2013; Morrison et al., 2002). Further, 55% of HIV positive women experience interpersonal violence, further exacerbating risks for poor mental health (Control, 2003). Taken collectively, WLWH may be at higher risk for decreased occupational productivity, leading to occupational inequities without intervention.

HIV-infection as a Socioeconomic Disease

Recent evidence suggests that while health status, such as living with a chronic disease, partially moderates employment status, personal and social contexts may also influence employment status and outcomes (Garrow, 2016; Gosselin et al., 2013). Yet, evidence is lacking regarding the mechanisms by which personal and socioeconomic contexts influence employment in PLWH. This is of particular concern as HIV-infection

is a disease associated with personal and social inequity, which may further contribute to inequity in employment outcomes and thereby access to the benefits of employment (Pellowski, Kalichman, Matthews, & Adler, 2013).

Socioeconomic Context of HIV-infection. HIV-infection is considered a socioeconomic disease (Pellowski et al., 2013). Although HIV-infection affects all races and genders, and is present in every state of the U.S., there is a disproportionate impact within certain demographic populations. For instance, the Southern U.S. has one of the highest incidence rates of HIV, and black woman are particularly impacted (Henry J Kaiser Family Foundation, 2018). Social contexts, such socioeconomic status, continue to drive health disparities in the HIV epidemic. For example, poverty and housing instability contribute to sexual partner mixing, facilitating the transmission of HIV. Further, stigmatization, discrimination, and economic distress (disproportionately present in the Southern United States) influence the risk of domestic violence, propagating the transmission and management of HIV (Adimora, Ramirez, Schoenbach, & Cohen, 2014; Pellowski et al., 2013). Poor socioeconomic status is also associated with decreased access to health care, influencing not only awareness of HIV status and linkage to care, but access to mental health care, thus impacting risk taking-behaviors and facilitating the spread of HIV (i.e., sexual risk taking, substance abuse) (Adimora et al., 2014; Frew et al., 2016; Pellowski et al., 2013). Thus, socio-economic status influences not only HIV transmission risk, but management of the disease, and the ability to live a productive, quality life (Adimora et al., 2014; Pellowski et al., 2013)

Cultural discrimination and stigmatization also influence HIV-related disparities. For instance, women living with and at risk for HIV are frequently subject to layered

stigma and cultural discrimination secondary to their HIV-status, race, gender, and socio-economic status (Dale et al., 2014; Frew et al., 2016). In the Southern U.S., HIV-related stigma is frequently greater, plausibly due to spiritual beliefs and cultural norms and beliefs regarding the transmission of HIV itself (Grodensky et al., 2015; Hutson, Darlington, Hall, Heidel, & Gaskins, 2018). The cumulative disenfranchisement from socioeconomic and cultural factors contributes to a state of disempowerment, contributing to poor personal and occupational outcomes, and creating a cycle that facilitates HIV disparities (Dale et al., 2014; Liu, Chang, Fu, Wang, & Wang, 2012; Liu et al., 2013; R. Dray-Spira, 2007; Wright, Perez, & Johnson, 2010).

Personal context of HIV disease. Due to the physical, psychological, and environmental contexts associated with HIV-infection, many PLWH experience disproportionate rates of poor mental health, psychological distress, and social isolation (Brody et al., 2014; Dale et al., 2014; van Servellen et al., 2002). Evidence suggests that these personal burdens extend past the influence of quality of life, affecting both clinical and occupational outcomes. (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Macsinga, Sulea, Sârbescu, Fischmann, & Dumitru, 2014; McGregor et al., 2014; van Scheppingen et al., 2015; van Servellen et al., 2002; Varekamp et al., 2011). Further, these personal contexts are thought to influence the ability to navigate a less than ideal socio-economic environment (Dale et al., 2014).

Psychological health. While good psychological health and coping strategies can serve as a resource to counteract poor environmental factors, poor psychological health may exacerbate the effects of negative social context - creating greater disparities (Dale et al., 2014). Taken in context that PLWH experience depression and anxiety at twice to four times the rate than the general population, the influence of psychological health on personal, clinical, and occupational outcomes is of particular concern (Do et al., 2014; Morrison et al., 2002).

Perceived stress. Women living with chronic disease, including HIV, demonstrate greater psychological distress than their male counterparts (Kennedy, 1995; van Servellen et al., 2002). Evidence suggests that this increase in perceived stress may be related to the interaction of gender roles and role-strain in the face of chronic disease. For example, studies investigating gender roles and psychological distress indicate that women face greater role-conflict and consequent distress secondary to the expectation of managing household, child-rearing, and occupational duties simultaneously (Dziak, Janzen, & Muhajarine, 2010; Floderus, Hagman, Aronsson, Marklund, & Wikman, 2009; Harryson, Novo, & Hammarström, 2012) . Chronic disease management further amplifies this burden (Gignac et al., 2014).

Social support. Increases in perceived stress and poor mental health associated with HIV-infection may be exacerbated by the social isolation that PLWH frequently experience (Breet, Kagee, & Seedat, 2014). Evidence suggests that social support serves as a vital resource in the management of HIV-specific care, mental health, and social

integration, including employment (Liu et al., 2012; Pellowski et al., 2013). As employment also influences physical health, mental health, and HIV-specific outcomes, the influence of social support on access to employment and occupational productivity is crucial (Degroote et al., 2014; Vance et al., 2015; Wagener et al., 2014)

Empowerment. Empowerment is a concept critical to the ability to overcome difficult situations. It can be defined as the ability to access internal and external skills and resources necessary to demonstrate resiliency and gain control over one's life (Wright et al., 2010). Because WLWH are frequently disenfranchised through social and personal contexts, it is important to look at how these mechanisms may alter empowerment in WLWH. Empowerment may facilitate employment and occupational productivity at work through its behavioral manifestations (Liu et al., 2013; Okechukwu et al., 2014; R. Dray-Spira, 2007; Wright et al., 2010). For instance, women who are empowered demonstrate greater assertiveness and less-self silencing than their less empowered counterparts (Brody et al., 2014; Dale et al., 2014), which may influence occupational outcomes (Hutting, Heerkens, Engels, Staal, & Nijhuis-van der Sanden, 2014; Varekamp et al., 2009). Empowerment has also been shown to decrease depression, anxiety, and stress through increased use of psychological capita, which further promotes increased productivity while at work (Leineweber, Westerlund, Hagberg, Svedberg, & Alexanderson, 2012; Liu et al., 2012; Liu et al., 2013). In addition to improving psychological health directly, empowerment may also improve personal outcomes through increasing employment rates and maintenance (Rothman, Hathaway, Stidsen, & Vries, 2007). Conversely, employment itself may empower women through

the provision of financial benefit, self-sufficiency, improved esteem, and social connectedness (Rothman et al., 2007)

Summary

Today, there are 1.1 million PLWH in the U.S. (Centers for Disease Control and Prevention). As HIV-infection is now considered a chronic, manageable disease, many PLWH are able to work and will need to work to ensure the many benefits of employment (Institute of Medicine, 2010). Evidence supports that personal and socioeconomic context influence employment and occupational productivity in PLWH. Yet, the literature is lacking regarding the mechanisms by which personal and socioeconomic contexts influence occupational success among HIV-infected women. In order to influence future interventions and policy to promote improved occupational, personal, and clinical outcomes among WLWH, a literature review was conducted to examine the current state of the evidence regarding occupational productivity and employment in those living with chronic disease, including HIV disease. The results of this review will be framed in the context of being a WLWH.

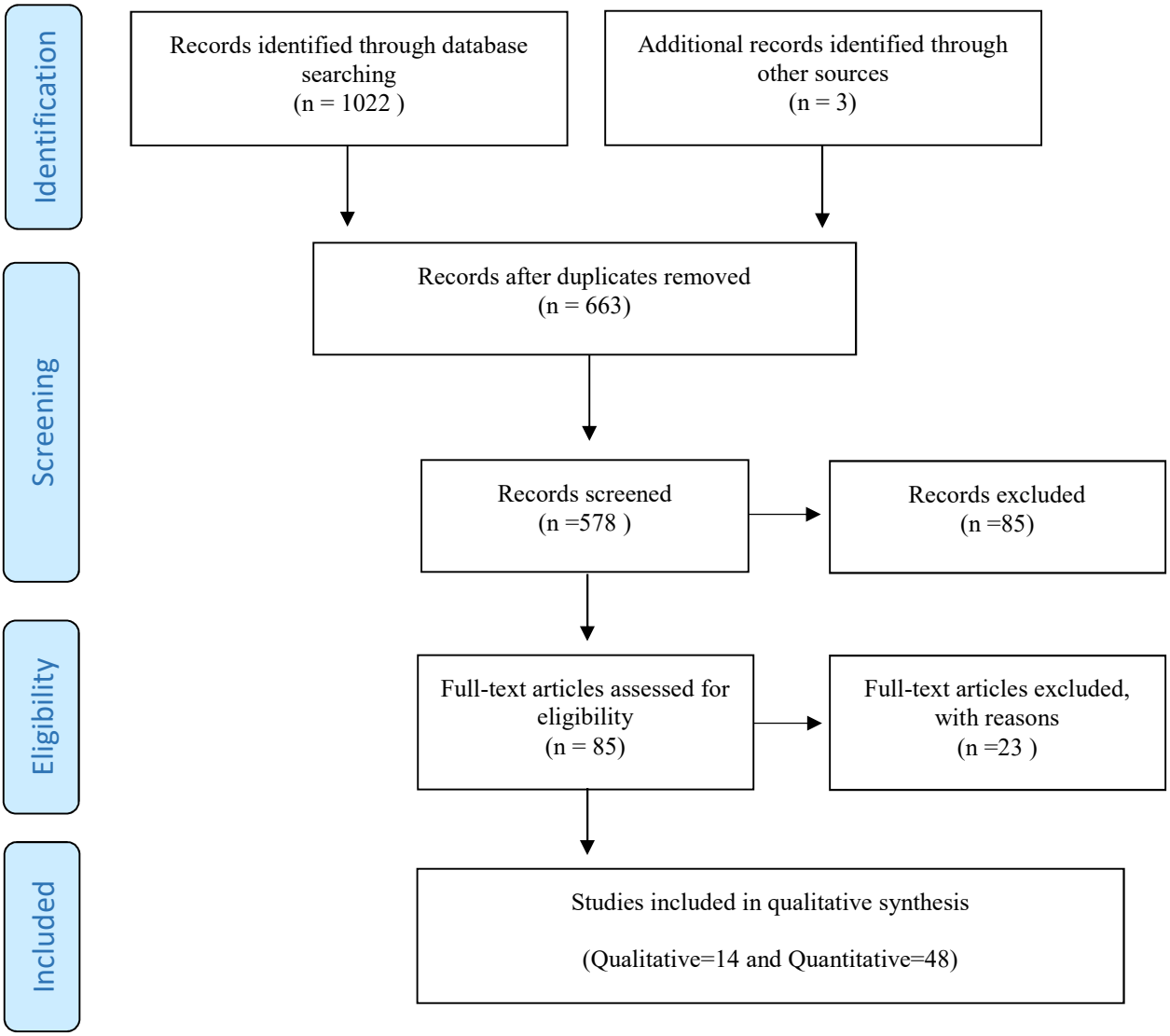
Search Strategy

A review of the current literature was conducted to examine the state of the science surrounding employment and occupational productivity in WLWH. Four literature searches were conducted between June 2017 and February 2018 across CINAHL, EMBASE, PsychINFO, PubMed and Scopus databases, depending on the initial sufficiency of results. The search was conducted using a combination of the terms

chronic disease, presenteeism, productivity, HIV, benefits, barriers, employment OR *work*, and *empowerment*.

Research articles were included if they were published in the last ten years, written in English, and available online. The initial searches yielded 1,022 articles, and removing duplicates yielded 663 publications. After step-wise review, 578 articles were excluded due to employment antecedents or outcomes not being discussed as a primary measure, or in the context of socioeconomic, psychosocial, personal, or health-related factors. An additional three articles were located through manual review of reference lists and sources through colleague referral, and other search techniques resulting in a total of 62 articles included in this review. The PRISMA diagram presented below portrays the search technique used. Thirty-three additional references are included in this chapter for contextual perspective.

Figure 1. PRISMA Flow Diagram



Synthesis of the Literature

Based on the review of the literature, employment and occupational status may be influenced by physical health, mental health, empowerment, and perceived social support. This synthesis of the literature addresses the current evidence and relationships

between these concepts. The conceptual framework portraying relationships among the variables of interest is located under the description of the theoretical framework.

Presenteeism

While occupational productivity can be examined by absenteeism or presenteeism, this dissertation examined the impact of presenteeism on occupational productivity. Whereas absenteeism is the behavior of not attending work due to illness or injury, presenteeism is typically defined as the behavior of attending work while mentally or physically ill (Bielecky et al., 2015; Bokma et al., 2017; Bustillos & Trigoso, 2013; Chang et al., 2015; Karlsson et al., 2010; Leineweber et al., 2012; McGregor et al., 2014). However, recent studies have examined presenteeism through the lens of any life factor influencing distractibility and productivity at work-including the ability to maintain work-life balance (Mikami et al., 2013; van Scheppingen et al., 2015; Varekamp et al., 2011). This includes, but is not limited, to health-related factors.

More comprehensively, the literature supports that presenteeism is influenced by health, personal, and psychosocial contexts (Garrow, 2016; Gosselin et al., 2013). For example, chronic physical or mental illness, particularly when experienced in combination, are associated with increased presenteeism, and therefore decreased productivity at work (Bielecky et al., 2015; Bokma et al., 2017; Bustillos & Trigoso, 2013; Leineweber et al., 2012). Personal contexts, such as perceived levels of empowerment, the ability to manage stress, and social support also influence productivity at work through direct and indirect mechanisms (Hilton, Scuffham, Sheridan, Cleary, & Whiteford, 2008; Leineweber et al., 2012; Varekamp et al., 2009; Varekamp et al., 2011;

Yu, Wang, & Yu, 2015). Social or organizational contexts are suggested to impact occupational productivity through its impact on empowerment, social support, psychological stress, and the ability to achieve work-life balance (Bustillos & Trigoso, 2013; Chang et al., 2015; Karlsson et al., 2010; Leineweber et al., 2012; McGregor et al., 2014; Mikami et al., 2013; van Scheppingen et al., 2015; Varekamp et al., 2009; Varekamp et al., 2011; Yu et al., 2015).

Although recent studies have demonstrated a relationship between occupational productivity, physical and mental health, perceived stress, empowerment, and social support, the mechanisms by which these factors influence productivity are largely unestablished. In particular, there is little evidence that evaluates the influence of personal and psychosocial contexts (i.e., perceived stress, empowerment, and social support) and chronic health conditions on occupational productivity. Therefore, this study examined the holistic nature of life-contexts influencing employment and occupational productivity among WLWH - with HIV disease being a chronic illness frequently accompanied by disenfranchising socioeconomic, psychosocial, and health-related contexts.

Physical Health

Although individuals living with chronic disease consistently demonstrate less productivity while at work than their healthy counterparts, employment is crucial to attain the numerous physical, psychological, and personal benefits of employment (Foundation, 2007; Leineweber et al., 2012). Evidence supports that employment is associated with improved physical health through increased resources (i.e., social support, health

insurance) (Catalan, Tuffrey, Ridge, & Rosenfeld, 2017; Li et al., 2015; van Gorp et al., 2007; Wagner, Holloway, Ghosh-Dastidar, Kityo, & Mugyenyi, 2011). However, stigma associated with HIV-infection also influences adherence to ART while employed, thereby negatively impacting physical health and chronic HIV-management (Amico et al., 2007; Sabin et al., 2008). Further, individuals living with chronic physical disease are more likely to demonstrate decreased occupational productivity due to the chronic nature of their condition (Bielecky et al., 2015; Bokma et al., 2017; Bustillos & Trigoso, 2013; Leineweber et al., 2012). Due to the daily occurrence of chronic disease symptoms, PLWH would be unable to maintain employment if they exhibited absenteeism with every interfering behavior. Social support, including flexible accommodations and support offered in the workplace, are suggested to positively influence physical health in employed individuals living with chronic disease (Tan et al., 2013; Torres-Madriz, Lerner, Ruthazer, Rogers, & Wilson, 2011).

Although the association between physical health, employment, and occupational productivity are well documented, there is minimal evidence to explain the influence of non-health related factors on employment and occupational productivity in individuals living with chronic disease. As employment and occupational productivity are influenced by socioeconomic and psychosocial contexts, this dissertation examined the influence of physical health as a partial predictor of employment and occupational productivity among women living with HIV.

Psychological Health

The experience of social stigmatization and discrimination secondary to race, gender, and HIV-status itself contribute to increased depression, anxiety, social isolation, and psychological distress in PLWH (Brody et al., 2014; Dale et al., 2014). High levels of abuse and unstable living conditions (i.e., housing and food insecurity) further contribute to higher levels of psychological distress, depression, and anxiety (Control, 2003; Wright et al., 2010). Because there is a cyclical relationship between poor mental health, low social support, and perceived stress, PLWH frequently are caught in a negative spiral, which impacts personal, clinical, and occupational outcomes (Breet et al., 2014; Liu et al., 2013; Zeligman, Barden, & Hagedorn, 2016).

Psychological health impairments, such as anxiety, depression and excessive stress increase the odds of presenteeism, and thereby, decrease occupational productivity (Bustillos & Trigoso, 2013; Hilton et al., 2008; Leineweber et al., 2012). When psychological impairments coexist with physical illness or negative symptomology, the odds increase further (Bielecky et al., 2015; Bokma et al., 2017).

Evidence suggests that women with chronic disease, including HIV disease, are particularly susceptible to poor employment outcomes due to higher rates of depression and perceived stress compared to men with chronic disease (Brody et al., 2014; Dale et al., 2014; Kennedy, 1995; Sverker, Östlund, Hallert, & Hensing, 2009; van Servellen et al., 2002). Studies investigating psychological distress indicate that women face greater role-strain and consequent distress due to the expectation of managing household, child-rearing, and occupational duties simultaneously (Dziak et al., 2010; Floderus et al., 2009; Harryson et al., 2012). In turn, this psychological distress affects work productivity

directly and through its influence on mental health (Bianchi & Milkie, 2010; Gignac et al., 2014). The management of a chronic disease adds another layer of responsibility, likely exacerbating role strain and psychological distress in WLWH (Gignac et al., 2014).

Occupational productivity, and specifically, levels of presenteeism, can be influenced by psychological distress associated with distraction from occupational duties and impact on decision making (Annalena, Laurenz, & Tanja, 2015; Chang et al., 2015; Karlsson et al., 2010; Li, Jiang, Yao, & Li, 2013; Mathisen & Bergh, 2016). Inefficiency in decision making, an insufficient ability to stay on task, and an impaired ability to tap into internal and external resources necessary to maintain resiliency in the face of distress may influence the worker's ability to maintain success in both occupational and personal realms (Karlsson et al., 2010; Wright et al., 2010). In this way, psychological distress also influences overall psychological health and empowerment, which in turn, affects social support and physical health (Degroote et al., 2014; Ice, 2017; Kuokkanen, Suominen, Harkonen, Kukkurainen, & Doran, 2009; Liu et al., 2013; Turan et al., 2016). All interact to influence occupational productivity and success (Al Sahi Al Zaabi, Ahmad, & Hossan, 2016; Kuokkanen et al., 2009; Liu et al., 2013; Turan et al., 2016; Zare, Zarmehr, & Ashrafi-Rizi, 2015).

Although research has demonstrated a relationship between psychological distress (i.e. depression and perceived stress) and occupational productivity, there are gaps in literature explaining the influence of these personal contexts and their mechanisms of action on occupational success among WLWH. Therefore, this dissertation examined the multivariable influence of the socioeconomic and personal factors (i.e. physical health,

psychological health, empowerment, and social support) on employment and occupational productivity in the holistic context of being a WLWH.

Empowerment

WLWH are at increased risk for personal and social disadvantage due to their socioeconomic status and the experience of interpersonal violence (Brody et al., 2014; Dale et al., 2014; Prevention, 2014; Wright et al., 2010). This collective disenfranchisement is frequently associated with decreased empowerment, or decreased ability to tap into internal and external resources necessary to maintain resiliency (Dale et al., 2014; Wright et al., 2010). Women who experience disempowerment are at risk for negative personal and occupational outcomes (Johnson, Worell, & Chandler, 2005; Kebriaei, 2016; Macsinga et al., 2014; Wright et al., 2010). Within the personal realm, empowerment is associated with perceived self-efficacy and the ability to successfully mitigate life's stressors (Jennifer et al., 2017; Johnson et al., 2005). Thus, empowerment influences physical health, psychological health, and social support, and thereby influences employment and occupational productivity indirectly (Brody et al., 2014; Liu et al., 2013; Turan et al., 2016; Wilson et al., 2018). However, recent studies support that empowerment has a positive direct influence on employment and occupational productivity through its association with increased autonomy, engagement, and commitment in the workplace (Al Sahi Al Zaabi et al., 2016; Arciniega & Menon, 2013; Chang et al., 2015; Kebriaei, 2016; Macsinga et al., 2014; Morin, Vandenberghe, Turmel, Madore, & Maiano, 2013).

Although the literature supports a relationship between empowerment, and personal and occupational outcomes, the conceptual definitions of empowerment vary substantially. Specifically, the conceptual definition of empowerment in the occupational literature is indicative of an empowering organizational infrastructure whereas the conceptual definition in the psychosocial based literature focuses on personal empowerment with an emphasis of resiliency and autonomy (Al Sahi Al Zaabi et al., 2016; Barringer, Hunter, Salina, & Jason, 2017; Brody et al., 2014; Jennifer et al., 2017; Macsinga et al., 2014). This dissertation examined empowerment from the more traditional psychosocial conceptual definition to see if intrinsic empowerment predicts occupational productivity. Additionally, the current evidence provides little knowledge regarding the role of empowerment, employment, and occupational productivity in a severely disenfranchised population, such as WLWH. This dissertation examined the role of empowerment in moderating disenfranchising personal and socioeconomic contexts, as well as the interplay between empowerment, personal and socioeconomic contexts, and occupational productivity in WLWH.

Social Support

WLWH frequently experience social isolation due to depression, anxiety, and perceived or actual stigma (Breet et al., 2014; Turan et al., 2016). The evidence suggests that social support influences physical health, psychological health, and empowerment (through increased access to resources) (Barringer et al., 2017; Jennifer et al., 2017; Johnson et al., 2005; Liu et al., 2013; Wilson et al., 2018). Recent studies support that employment status and engagement at work is positively associated with social support

(Rothman et al., 2007). Further, social support is thought to have an inverse relationship with presenteeism, thereby increasing occupational productivity (Bustillos & Trigoso, 2013; Karlsson et al., 2010; McGregor et al., 2014).

The literature poses two main conceptual definitions of social support which are thought to moderate personal and occupational outcomes in WLWH. The conceptual definition of social support in the occupational literature reflects a positive work culture, with low-levels of discrimination, and high levels of organizational support (Chang et al., 2015; Kuokkanen et al., 2009; van Scheppingen et al., 2015). Whereas, the conceptual definition of social support in the psychosocial literature reflects the ability to access emotional/informational, tangible, and affectionate support from individuals within the community (Breet et al., 2014; Sherbourne & Stewart, 1991; Zeligman et al., 2016). This dissertation research bridged the two concepts to see if social support in the psychosocial framework influences employment and occupational productivity in WLWH.

Identified Gaps and Opportunities for Research

This literature review identified several areas where additional evidence-based research is needed to guide intervention development and improve outcomes. While both psychological and physical health influences occupational outcomes, there's little evidence regarding interventions that may improve outcomes through addressing these contexts. Further, much of the literature on productivity focuses on health status as the main predictive factor for productivity. Yet, it is unreasonable to think that health is the only distracting factor in an individual's life - particularly in the personal and socioeconomic contexts of being a WLWH. Therefore, this study examined the

experience of employment and socioeconomic, psychosocial, and health-related factors driving employment and occupational productivity. Specifically, in order to develop future intervention to promote improved occupational, personal, and clinical outcomes in WLWH, this study examined the impact of socioeconomic, psychosocial, and health-related characteristics on employment, occupational productivity, and HIV-related outcomes among WLWH in the U.S. Women at risk for acquiring HIV (WARH) were included to better elucidate the impact of HIV-infection on employment, relative to the socioeconomic and psychosocial contexts associated with HIV. The theoretical framework and research design presented in the following sections will provide specificity as to the socioeconomic, psychosocial, and health-related context that were examined.

Theoretical Framework

The theoretical framework for this research is supported by the evidence and guided by the Transactional Model of Stress and Coping. The Transactional Model of Stress and Coping acknowledges that our appraisal of life encounters as positive, neutral, or threatening depends on our evaluation of the encounter as influenced by personal and socioeconomic factors. Personal factors include our perspectives as influenced by our physical and psychological states, and resources available to handle encounters successfully. Socioeconomic factors include distribution of resources, power, and money, which influence ability to manage threatening encounters, as well as overall health and wellbeing. These factors influence not only the perception of life encounters, but the perceived and actual ability handle or cope with these encounters. When problem

encounters are successfully addressed, stress is minimal. However, if problem encounters cannot be overcome through problem solving and coping, the cumulative effect of stress can be substantial, leading to biological, psychological, and behavioral changes, thus, influencing employment and occupational productivity among WLWH.

In line with Lazarus & Folkman's (1984) model, personal and socioeconomic contexts influence reaction to life events. For the purposes of this dissertation, the model was modified to examine the impact of personal and socioeconomic contexts on employment and occupational productivity among WLWH.

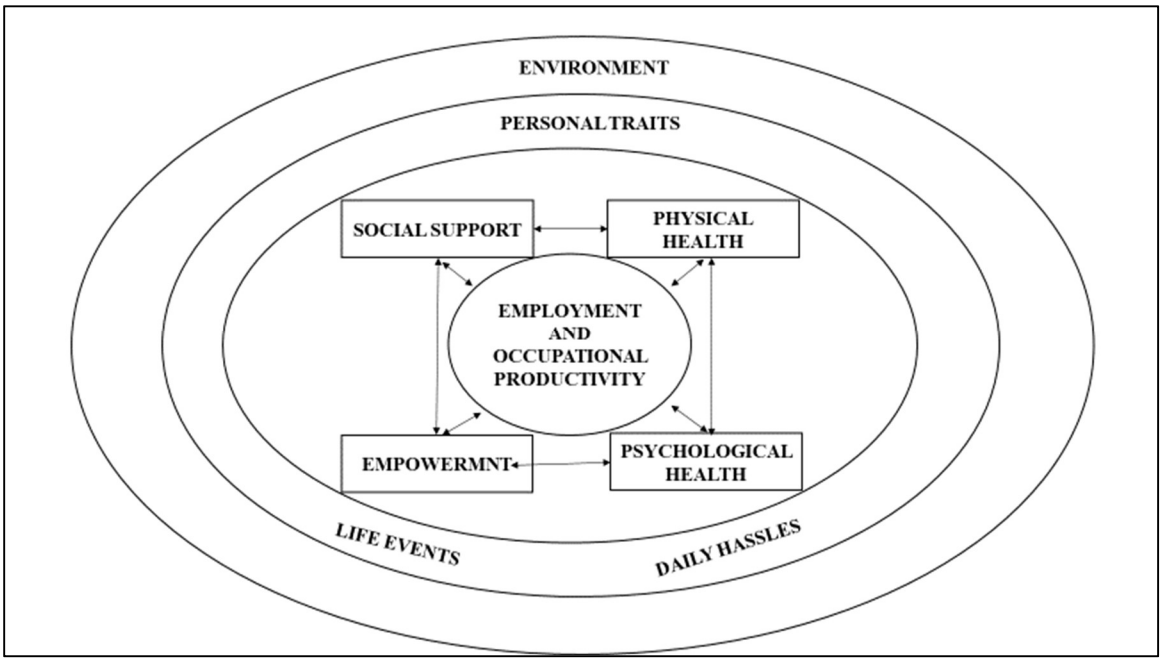


Figure 2. Conceptual Model of Employment and Occupational Productivity among Women Living with HIV. Adapted from Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*(3), 141-169

Based on evidence, there is a bi-directional relationship between personal contexts (i.e., physical health, psychological health, empowerment, and social support), and employment and occupational productivity among WLWH. Further, the evidence suggests that the socioeconomic environment and personal traits influence personal contexts, and thereby, exert there influence on employment and occupational productivity among this population. Socioeconomic contexts were defined as the sociodemographic characteristics influencing employment and occupational productivity in WLWH and included: age, race, education, relationship status, childcare responsibility, household income, and housing stability. Personal contexts were defined as individual traits influencing employment and occupational productivity among WLWH and included: physical health, psychological state (depression, anxiety, perceived stress, cognition), social support, and empowerment. To elucidate the impact of HIV-infection on employment, the socioeconomic and personal contexts associated with HIV-infection were also examined in WARH. In WLWH, additional measures of psychological health (i.e., internalized HIV-stigma) and physical health (i.e., HIV-specific outcomes) were assessed in relation to both employment and occupational productivity.

Summary

Lazarus and Folkman's Transactional Model of Stress and Coping guided the research design and interpretation of this dissertation. As posed by the model, personal and socioeconomic contexts influence our psychological and behavioral responses, thus influencing outcomes. In this study, the central outcome of interests were employment

and occupational productivity as influenced by socioeconomic, psychosocial, and health-related contexts.

Research Design

To fully evaluate the research problem, and comprehensively address the research purpose, research aims were explored through a concurrent mixed methods design to gain complementarity and triangulation of data sources and increase validity and breadth of findings. Aims 1 - 3 were examined quantitatively through descriptive correlational and regression analysis methods. Aim 4 was explored using a hermeneutic phenomenological approach. The purpose of using both quantitative and qualitative methodologies was to allow for a deeper understanding than could be acquired through either a quantitative or a qualitative approach independently.

Quantitative

Specific Aim 1 sought to examine the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH and WARH. As little is known about the comprehensive (i.e., socioeconomic, psychosocial, and health-related) contexts influencing employment in WLWH, an observational design was most appropriate (Polit, 2017). The type of observational approach, which was employed in this research is a cross-sectional, descriptive correlational approach. This method was chosen based on the current, limited state of the evidence surrounding employment among WLWH. In addition, this approach allowed for the collection and examination of a large amount of data that would otherwise not be possible due to logistical restraints. A

limitation of this approach is that it does not allow for causal implications. However, the benefits of the approach providing a broad amount of information to inform overall study inferences and guide future research outweigh this limitation.

Specific aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH. As HIV as evolved into a chronic, manageable disease, the current day impact of HIV-infection on employment must be evaluated to understand the present-day implications related to living with HIV. A cross-sectional, descriptive, correlational approach was used to inform understanding of the current day impact of living with HIV, and elucidate the relationships between HIV-outcomes and employment. Although this approach does not allow for causality, logistical restraints within the dissertation prevented longitudinal analysis.

Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV. Descriptive, correlational, and multivariable regression analyses were used to examine Aim 3. This method was chosen for its ability to predict causal outcomes, in this case, occupational productivity. A benefit of this approach was that it provided information on the magnitude of influence, or explanatory capacity of each variable in context of all variables included. For the purposes of this study and in logical consideration of the current evidence in the literature, physical health, depression, perceived stress, social support, and empowerment were selected a priori as contextual variables influencing occupational productivity in WLWH. A limitation of this approach was that it does not allow for as much control over confounding variables as a randomized controlled trial would. However, this approach was feasible within an appropriate timeline for a

dissertation, and the results were interpreted in contexts of the existing literature and the qualitative findings from Aim 4.

Qualitative

Specific Aim 4 sought to explore the significance, lived experience, contexts surrounding, and meaning attributed to employment among employed WLWH. As Specific Aim 4 sought to understand the lived meaning and significance of experiences as described by the individual, a hermeneutic phenomenological approach was most appropriate. Semi-focused interview questions were formulated based on literature review and designed to gain insight into the experience, meaning, and context surrounding employment for WLWH. Benefits of using a phenomenological approach included the ability to provide fresh insight related to the current theories and evidence in the literature, as well as for its usefulness in informing developing theory. Moreover, this approach provided richer detail and a more lively explanatory capacity than quantitative data would allow for alone (Creswell, 2018; Polit, 2017). A limitation of this method was that substantial time had to be allocated for data collection, analysis, and interpretation of this aim. However, the personal resources necessary to conduct this aim were considered and determined to be both appropriate and feasible in relation to the timeline expected for this dissertation. Although well-established as a scientific method, qualitative research is sometimes viewed as less credible than quantitative methods (Creswell, 2018; Polit, 2017). However, this research design allowed for the benefits of both quantitative and qualitative research design, as well as triangulation and complementarity of data (Plano Clark, 2016).

Mixed Methods

The combination of quantitative and qualitative data collection and analysis was chosen to more comprehensively address the purpose of this research. The combination of quantitative and qualitative methods is referred to as mixed methods research. The rationale for the inclusion of both methods is to capture the complexity and wholeness of the research problem to more effectively understand and address the problem (Onwuegbuzie & Collins, 2007; Plano Clark, 2016; Polit, 2017). A concurrent mixed methods design was chosen for this research to allow for complementarity and triangulation of data (Plano Clark, 2016). The two methods were integrated after data collection and analyses occurred, to allow for more depth and breadth of interpretation. A strong benefit of using a mixed methods approach was that it allowed for the strengths of each approach to be maximized, while minimizing weaknesses (Plano Clark, 2016). A limitation of the approach included that extensive time was needed to preform both quantitative and qualitative research procedures. However, the benefits and limitations of selecting a mixed methods design were considered and determined to be appropriate and feasible.

Summary

In summary, descriptive, correlational, multivariable regression, and phenomenological analytical methods were selected for this dissertation due to their appropriateness to answer the research questions and in light of logistical restraints. A mixed methods design was selected to most comprehensively and holistically inform our

understanding of the research problem. In this manner, the strengths of each were able to be realized, while minimizing their respective weaknesses of each method.

Research Methods

The information below describes the setting, sample, and data collection methods that were selected to best answer the research questions.

Setting

This study utilized secondary data from the Women's Interagency HIV Study (WIHS) to investigate Aims 1 - 3 . Supplemental qualitative interviews were conducted among a sub-set of WIHS participants to explore Aim 4. WIHS represents the largest prospective cohort study of HIV-infection in women in the United States and is largely representative of the adult, female, HIV-infected population in the U.S.. WIHS has active research sites across the U.S. to increase representativeness of the study population including: Alabama, Florida, Georgia, Illinois, New York, North Carolina, Mississippi, and Washington D.C (Health). The overall aim of WIHS is the comprehensive investigation of the impact of HIV-infection in women (Health, n.d.). Participants undergo comprehensive study visits every six months including clinical, psychological, and socioeconomic evaluation(Health, n.d.).

Sample

Specific Aim 1 sought to examine the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH and WARH.

All WLWH (*n* = 1463) and WARH (*n* = 619) who attended a WIHS visit between April and October 2018 (i.e., visit 48) were included in Aim 1 analyses if they: (1) Were under 65 years of age at the time of the visit (*n* = 1967); and (2) Answered the question "Are you currently employed" (*n* = 1933). Women 65 years and older were from the study sample as they are past the cut-off for working age, and may have contexts which are different than the WLWH and WARH who are under this cut-off (OECD, 2018). Women not reporting employment status were excluded based on the main outcomes of this study. Specific Aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH. All WLWH, who attended a WIHS visit between April and October 2018 (visit 48), were under the age of 65 at the time of the visit, and reported employment status (*n* = 1373) were included in Aim 2 analyses. Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV. All employed WLWH, who completed WIHS visits between April and October 2018 at four selected Southern sites (Alabama, Georgia, North Carolina, and Mississippi), were under age 65 at the time of the visit, and completed the occupational productivity assessment (*n* = 164) were included in Aim 3 analyses. The selected WIHS sites were chosen to examine Aim 3 based on: (1) The South being the epicenter of the HIV epidemic in the U.S. the HIV epidemic in the Southern U.S. ;and (2) site agreeableness to incorporate the Personal Progress Scale-Revised (Johnson et al., 2005) and Stanford Presenteeism Scale-6 (Koopman et al., 2002) into their core visit protocol. Finally, Specific Aim 4 sought to explore the significance, lived experience, and contexts surrounding employment for

WLWH. A purposive convenience sample (N=29) of WIHS participants completing Aim 3 were recruited for this aim.

The benefits and limitations of conducting research under a parent study were carefully considered. Benefits included: (1) quantitative data for Specific Aims 1 -3 were readily available and representative of WLWH and WARH in the U.S.; and (2) using secondary data is time and cost-efficient (Polit, 2017). Limitations included that there is a loss of control when utilizing data from a parent study, which the researcher would otherwise be able to control for through the collection of all variables of interest and careful consideration to inclusion/exclusion criteria. However, the WIHS study population and data available was carefully considered and determined to be appropriate to use to address the research aims and the overall purpose of this dissertation.

Data Collection

Quantitative data collection. Based on a comprehensive literature review, variables of interest were selected to best inform the research aims. Specific Aim 1 sought to examine the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH and WARH. Table 1 presents the operationalization of the variables of interest, which were used to examine Aim 1.

Table 1. Operationalization of Variables to Address Aim 1

Variable	Operationalization
Socioeconomic Context	
Socioeconomic Status	• Race • Household Income • Educational Attainment • Marital Status
Housing Stability	• Where are you living now? • How long have you stayed at the place you stayed last night?
Childcare Responsibility	• Number of Children under 19 years of age you are responsible for • How many hours per week do you provide childcare?
Abuse	• Since your last study visit, have you experienced serious physical violence (physical harm by another person)? • Since your last study visit, has a current or previous partner prevented you from getting or keeping a job?
Psychosocial Context	
Depression	• Center for Epidemiological Studies-Depression Scale (Radloff, 1977)
Anxiety	• Generalized Anxiety Disorder- 7 item Scale (Spitzer, Kroenke, Williams, & Lowe, 2006)
Stress	• Perceived Stress Survey (Cohen, Kamarck, & Mermelstein, 1983)
Cognitive Function	• Neurocognitive Battery: Hopkins Verbal Learning Test-Revised, Trail Making Test Part B, Stroop Test, and Symbol Digit Modalities Test (Arbuthnott & Frank, 2000; Lezak, 2004; Shapiro, Benedict, Schretlen, & Brandt, 1999; Stroop, 1935)
Social Support	• Tangible and Emotional Support subscales of MOS Social Support Survey (Sherbourne & Stewart, 1991)
Health-Related Context	
Quality of Life	• MOS-HIV Health Survey (Wu, Revicki, Jacobson, & Malitz, 1997) •
Comorbidities	• Clinical blood pressure reading ≥140/90, use of anti-hypertensive medications, or self-reported high blood pressure • Fasting blood glucose ≥126 mg/dl, hemoglobin A1C≥6.5%, use of antidiabetic medication, or self-reported diagnosis of diabetes
Health Indicators	• Use of cigarettes • IV drug use- past six months • Recreational drug use- past six months • Alcoholic drinks per week – past six months • Health Insurance (or ADAP or Ryan White Assisted Program)
Outcome	
Employment	• Are you currently employed? • Hours worked per week

Specific Aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH. Based on the literature review, the variables presented in Table 2 were selected for examination. Table 2 describes the operationalization of the variables used to address Aim 2.

Table 2. Operationalization of Variables to Address Aim 2

Variable	Operationalization
Adherence to Care	• In the last six months, how many times did you go for regular HIV care? • In the last six months, did you miss any scheduled regular HIV care appointments?
Antiretroviral Therapy	• Current antiretroviral therapy prescribed
Adherence to Medication	• In the last six months, how often did you take your antiretrovirals as prescribed?
HIV-management	• HIV RNA copies/ml (viral load) • CD4 cells/mm3
Internalized HIV Stigma	• HIV Stigma Scale (Berger, 2001)
Employment	• Are you currently employed?

Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV. Based on the literature review, the variables presented in Table 3 were selected for examination. Table 3 describes the operationalization of the variables used to address Aim 3.

Table 3. Operationalization of Variables to address Aim 3

Variable	Operationalization
Socioeconomic Context	
Socioeconomic Status	• Race • Household Income • Educational Attainment • Marital Status
Housing Stability	• Where are you living now? • How long have you stayed at the place you stayed last night?
Childcare Responsibility	• Number of Children under 19 years of age you are responsible for • How many hours per week do you provide childcare?
Abuse	• Since your last study visit, have you experienced serious physical violence (physical harm by another person)?
Psychosocial Context	
Depression	• Center for Epidemiological Studies-Depression Scale (Radloff, 1977)
Anxiety	• Generalized Anxiety Disorder- 7 item Scale (Spitzer et al., 2006)
Stress	• Perceived Stress Survey (Cohen et al., 1983)
Cognitive Function	• Neurocognitive Battery: Hopkins Verbal Learning Test-Revised, Trail Making Test Part B, Stroop Test, and Symbol Digit Modalities Test (Arbuthnott & Frank, 2000; Lezak, 2004; Shapiro et al., 1999; Stroop, 1935)
Social Support	• Tangible and Emotional Support subscales of MOS Social Support Survey (Sherbourne & Stewart, 1991)
Personal Empowerment	• Personal Progress Scale-Revised(Johnson, Worell, & Chandler, 2005)
Health-Related Context	
Quality of Life	• MOS-HIV Health Survey (Wu et al., 1997)
Comorbidities	• Clinical blood pressure reading ≥140/90, use of anti-hypertensive medications, or self-reported high blood pressure • Fasting blood glucose ≥126 mg/dl, hemoglobin A1C≥6.5%, use of antidiabetic medication, or self-reported diagnosis of diabetes
Health Indicators	• Use of cigarettes • IV drug use- past six months • Recreational drug use- past six months • Alcoholic drinks per week – past six months • Health Insurance (or ADAP or Ryan White Assisted Program)
HIV-Specific Context	
Adherence to Care	• In the last six months, how many times did you go for regular HIV care? • In the last six months, did you miss any scheduled regular HIV care appointments?
Antiretroviral Therapy	• Current antiretroviral therapy prescribed
Adherence to Medication	• In the last six months, how often did you take your antiretrovirals as prescribed?
HIV-management	• HIV RNA copies/ml (viral load) • CD4 cells/mm3
Internalized HIV Stigma	• HIV Stigma Scale (Berger, 2001)
Outcome	
Occupational Productivity	• Stanford Presenteeism Scale-6 (Koopman et al., 2002)

Benefits of quantitative data collection included: (1) Data was readily available through the WIHS; and (2) Comparison was possible among WLWH and WARH. Limitations included: (1) Measurements were self-reported; and (2) Aim 3 data collection was limited to Southern WIHS sites (Polit, 2017). These limitations will be considered during the interpretation of study results.

Qualitative data collection. Specific Aim 4 sought to explore the significance, lived experience, and contexts surrounding employment for WLWH. A single forty-five minute phone interview was conducted with 29 WIHS participants who also completed Aim 3 data collection. Table 4 displays the interview script used, which was developed with the help of concepts identified during the literature review. Following hermeneutic phenomenology, the questions were designed to gain insight into the experience, meaning, and context surrounding employment for WLWH (Onwuegbuzie & Collins, 2007). Benefits of semi-focused interviews included: (1) Rich description of the lived experience and meaning attributed to employment for WLWH; (2) Ability to add depth of understanding, complementarity, and triangulation to quantitative data analysis (Plano Clark, 2016). A limitation was that interviews occurred over the phone, rather than in person, which negated the ability to draw from body language and facial expressions. Although in-person interviews would have added context to participant responses, phone interviews were used due to fiscal and logistical constraints.

Table 4. Qualitative Interview Script

Item	Question
1	• I'm going to ask you questions related to how your life affects your job and what your job means to you. First, let's start with the basics. What does work mean to you personally? I'd like you to describe how work adds to your value or worth as a person, or is it more of a means to an end for you?
2	• What do you do for work? What kind of tasks do you do on a daily basis? What kind of hours do you work?
3	• Tell me how you made the decision to accept your current job. What about the job was most appealing to you?
4	• Since you've been working, what are your reasons for staying with the job? What kind of benefits does working provide you outside of money?
5	• Can you describe some of the work-related challenges you face? What techniques or strategies have you used to handle them?
6	• Do you have reliable transportation? What kind? If no, how do you manage getting to and from your job? How does that affect your ability to work?
7	• Tell me about what you've had to give up personally in order to work. How do you balance work with other important things in your life? I'd like you to describe your current work-life balance.
8	• What are your responsibilities to take care of outside of work? Can you tell me how you manage those responsibilities? Can you tell me about a situation where you couldn't manage your real-life responsibilities because of your work? What did you do?
9	• How has living with HIV affected your work? Has working affected your medications? Has working affected your doctor's appointments? How have you managed?
10	• Please describe how your family or friends support or hinder your ability to work. What have you done to help find support or how have you handled friends and family if they have hindered you working? Tell me about that.
11	• I'd like you to describe any accommodations your work provides to help make life easier for you? For example, do they allow for flexible scheduling or shifts, or are they flexible with your doctor's appointments and other important things that come up in life? Tell me about a time you had to speak up for yourself or use certain strategies to get work to accommodate your needs. Do you feel like you can speak up at work? Tell me more about that.
12	• Please describe any arrangements that help balance your work and personal lives. This includes things like childcare, support from family and friends, doctor visits, and time for you.
13	• Overall, do you feel like you have more control or less control over your life because of your job? I'd like you to tell me about at least one example when you felt this way.

Summary

In summary, the benefits and limitations of the proposed research design and methods have been carefully evaluated and selected for their logistical feasibility and appropriateness to answer the research questions. Limitations of the proposed research include that the research design does not allow causal inference (Polit, 2017). However, this research design is appropriate considering the minimal evidence in the literature addressing the influence of personal and social contexts on employment and productivity in WLWH (Polit, 2017). A second limitation in this research is that although WIHS participants are representative of the adult, female, HIV-infected population in the United States, aim two and three will be conducted using a limited sub-set of the total WIHS population. Therefore, research findings will have limited generalizability due to the cultural context of the Southern U.S. being different from other areas of the U.S. Qualitative analysis will be conducted to enhance our understanding of the personal and social context influencing occupational productivity in this region (Creswell, 2018). All limitations of the proposed research will be considered and integrated into the conclusions drawn from the data.

Ethical Consideration

The proposed study has been submitted to and approved by the University of Alabama's Institutional Review Board. In line with the Belmont Report, research must be conducted in ways that demonstrates respect for persons and protects the right to beneficence including the right to privacy and confidentiality (Protections, 1979). WLWH may be considered a vulnerable population due their socioeconomic status and personal

characteristics associated with HIV-infection. For instance, many WLWH experience personal and cultural disadvantage secondary to their gender, race, HIV status, and socio-economic status (Brody et al., 2014; Dale et al., 2014). This disadvantage may result in poor mental health and personal disempowerment (Brody et al., 2014; Dale et al., 2014) . Therefore, research conducted in this population must be performed in such a way that its participants are protected from coercion or vulnerability secondary from the lived experience of being a WLWH (Shamoo, 2009) . All women participating in the proposed study will undergo a full informed consent process to ensure understanding and willingness to participate without the presence of coercion (Polit, 2017). The voluntary nature of research, including the right to withdraw at any time, will be emphasized (Shamoo, 2009). WLWH may also be at a disadvantage related to their vulnerability to job loss (Dray-Spria, 2007). To protect occupational success in this population, all study interviews will be scheduled at a time most convenient to the participant so that it does not interfere with employment or other personal responsibilities.

As HIV-infection is also a stigmatized condition, maintaining participant's anonymity and privacy is crucial to the protection of their well-being. To protect participant's privacy, all interviews will occur in a private environment where they are not likely to be overheard (Shamoo, 2009). Confidentiality will be protected through the storage of data on encrypted, password protected computers with non-identifying IDs. Participants may also choose to use pseudo-names during interview purposes. No information that may identify the participants will be used in any publication or presentation relevant to this research (Shamoo, 2009).

In summary, WLWH may be vulnerable to coercion due to their socioeconomic status, stigmatization, or impaired mental health (Grodensky et al., 2015; Pellowski et al., 2013; Shamoo, 2009). In order to ethically conduct research in this population, special considerations have been considered and put in place to ensure protections are adequate. The University of Alabama at Birmingham's IRB has approved this protocol and all study procedures will be conducted according to local and federal research regulations.

Chapter Two Summary

WLWH in the U.S. are frequently able to work and need to work to secure the financial, physical, mental, and social benefits associated with employment (Conyers, 2011; Degroote et al., 2014; Institute of Medicine, 2010; Vance et al., 2015). However, employment rates in the overall HIV population, and particularly, among WLWH, remain inadequate (Dray-Spira et al., 2008; R. Dray-Spira, 2007). The literature supports that while health status influences employment status and occupational productivity in WLWH, mental health (i.e. depression, anxiety, and perceived stress), social support, and empowerment may influence occupational, personal, and clinical outcomes in this population (Bielecky et al., 2015; Dale et al., 2014; Garrow, 2016; Gosselin et al., 2013; Hafner, 2012; Liu et al., 2013; McGregor et al., 2014; van Scheppingen et al., 2015; Varekamp et al., 2011). Considering this multi-factorial influence of these personal traits, and the impact of the socioeconomic environment on these personal traits (Pellowski et al., 2013), a deeper understanding is necessary to improve personal and societal outcomes.

The study examined employment status and occupational productivity through a mixed methods design. A mixed methods design was most appropriate as neither a quantitative or qualitative research design alone would provide sufficient insight into the research problem (Plano Clark, 2016). Ethical considerations necessary for the responsible conduct of human subject research was considered and implemented.

The Transactional Model of Stress and Coping guided this study, with the outcome being occupational productivity-thus affecting quality of life, community productivity, and overall economics (Lazarus, 1984). The model provided an excellent framework for understanding the personal and social context influencing occupational productivity in WLWH. Although recent evidence suggests the multivariable influence of personal and social context on occupational productivity, the mechanisms through which these occur have not been thoroughly explored. Nor, has occupational productivity been sufficiently addressed in WLWH. Therefore, the purpose of the proposed study was to examine the impact of personal and social characteristics on employment, occupational productivity, and HIV-related outcomes among HIV-infected women enrolled in WIHS. Chapter 3 will describe and define the research methods to be used in greater detail.

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CHAPTER 3

METHODOLOGY

The purpose of this chapter is to describe the research methodology used to carry out the aims of this study. Specifically, this chapter will provide details on study procedures used including sampling, informed consent, data collection, and analysis. The appropriateness of instruments used to address research aims will be discussed. The research methodology described within was purposefully selected based on the research problem, current state of the evidence, and appropriateness to address study aims (Terrell, 2016). Based on these factors, both quantitative and qualitative methodology were included to gain comprehensive insight into the contexts surrounding employment for WLWH.

Research Design

This research study used a concurrent mixed methods design to comprehensively address the research problem. The two distinct phases of research, consisting of both quantitative and qualitative methodology, allowed for complementarity and triangulation of data sources and increased the validity and breadth of findings from this study (Plano Clark & Ivankova, 2016; Teddlie & Tashakkori, 2009; Morse, 2015). The goal of the quantitative phase was to examine the relationships between: (1) Socioeconomic, psychosocial, and health-related context and employment among WLWH and WARH; (2) employment and HIV-specific outcomes among WLWH; and (3) socioeconomic,

psychosocial, and health-related contexts and occupational productivity among employed WLWH. The rationale for including quantitative methodology was to allow for concrete data and statistical analysis, which would support or refute the evidence in the literature and existing theory. The goal of the qualitative phase was to explore the significance, lived experience, and contexts surrounding employment for WLWH. The rationale for including qualitative methodology was to allow for greater detail and explanatory capacity than quantitative data can provide alone, and to provide fresh insight into current and evolving nursing theory (Greene et al., 1989; Tashakkori & Teddlie, 1998).

The combination of quantitative and qualitative methodology is referred to as mixed methods research. The rationale for the including both quantitative and qualitative methodology was to capture the complexity and wholeness of the research problem, and to more effectively understand and address the problem (Onwuegbuzie & Collins, 2007; Plano Clark & Ivankova, 2016; Polit & Beck, 2017). Mixed methods research can be implemented in varying iterations of sequencing and points of integration, lending itself to the achievement of different research aims. Therefore, the timing and priority of each phase should be chosen based on the research purpose and driven by the research questions. Because the rationale for mixed methods research in this study was to allow for complementarity and triangulation of data, while maximizing the strengths and minimizing the weaknesses of each methodology, a concurrent research design was most appropriate. Neither the quantitative or qualitative research design innately carried priority. Rather, data analysis from each phase informed the interpretation of the other. Table 1 describes the concurrent mixed methods research design used for this study.

Table 1. Mixed Method Research Procedures and Products

Steps	Procedures	Products
Aim 1		
Quantitative Data Collection	Surveys, clinical testing, and bloodwork (n = 1933)	Demographics, Socioeconomic, Psychosocial, and Health-related context, Employment
Quantitative Data Analysis	Descriptive Statistics, Inferential Statistics, Simple Linear Regression	Mean, SD, Frequency, Percentile, Correlation coefficients, p-value
Aim 2		
Quantitative Data Collection	Surveys and bloodwork (n = 1373)	Demographics, HIV-specific outcomes, Employment
Quantitative Data Analysis	Descriptive Statistics, Inferential Statistics, Simple Linear Regression	Mean, SD, Frequency, Percentile, Correlation coefficients, p-value
Aim 3		
Quantitative Data Collection	Surveys, clinical testing, and bloodwork (n =*164)*	Demographics, Socioeconomic, Psychosocial, and Health-related context, Occupational Productivity
Quantitative Data Analysis	Descriptive Statistics, Inferential Statistics, Simple Linear Regression, Multivariable Regression	Mean, SD, Frequency, Percentile, Correlation coefficients, standardized ß, p-value
Aim 4		
Qualitative Data Collection	Semi-focused interviews (n = 29)	Transcribed qualitative data
Qualitative Data Analysis	Hermeneutic Phenomenology, Thematic Analysis	Themes
Triangulation of Data	Results of quantitative and qualitative data are compared and contrasted.	Convergent and divergent data
Critical Interpretation of Results	Quantitative and qualitative data are compared and contrasted for complementarity and triangulation of data.	Greater breadth and depth of understanding of relationships of interest, and their impact on employment and occupational productivity. Contribution to current evidence, the literature, nursing theory, and future intervention development.

Phase 1: Quantitative Aims

The purpose of the quantitative phase of this study was to examine the relationships between: (1) Socioeconomic, psychosocial, and health-related contexts and employment among WLWH and WARH; (2) employment and HIV-specific outcomes among WLWH; and (3) socioeconomic, psychosocial, and health-related contexts and occupational productivity among employed WLWH. A concurrent mixed methods design was used to comprehensively address the research problem. The two distinct phases of research, consisting of both quantitative and qualitative methodology, allowed for complementarity and triangulation of data sources and increased the validity and breadth of findings from this study (Plano Clark & Ivankova, 2016; Teddlie & Tashakkori, 2009; Morse, 2015). Based on the current state of the evidence surrounding this topic, as well as the purpose of this study, a quantitative approach was appropriate to include to best address the research problem. This section of the chapter will provide information on the study procedures chosen to address the quantitative aims of the study including sampling, recruitment, data collection and analysis, and techniques used to promote study reliability and validity.

Study population and sample. The population most appropriate to answer the research question is working-aged WLWH and WARH in the U.S. This study utilized data collected from WIHS to investigate Aims 1 - 3. WIHS is the largest prospective cohort study of WLWH in the U.S. and is largely representative of the adult, female, population living with and at risk for HIV in the U.S. (Johns Hopkins School of Public Health, n.d.a.). To increase representativeness of the U.S. population of WLWH and

WARH, WIHS has active research sites across the U.S. including sites in: Alabama, Florida, Georgia, Illinois, New York, North Carolina, Mississippi, California and Washington D.C. (Johns Hopkins School of Public Health, n.d.a.). Access to WIHS data was been granted through the submission and approval of a concept sheet reviewed by WIHS leadership (See Appendix: WIHS Concept Approval). The overall aim of WIHS is the comprehensive investigation of the impact of HIV-infection on women in the U.S. (Johns Hopkins School of Public Health, n.d.a.). Participants undergo comprehensive study visits every six months including clinical, psychological, and socioeconomic evaluation.

Specific Aim 1 sought to examine the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH and WARH. All WLWH (n = 1463) and WARH (n = 619) were included in Aim 1 analyses if they: (1) Were under 65 years of age at the time of the visit (n = 1967); and (2) answered the question "Are you currently employed" (n = 1933). Specific Aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH. All WLWH, who attended a WIHS visit between April and October 2018 (visit 48) (n = 1463), were under the age of 65 at the time of the visit (n =1384), and reported employment status (n = 1357) were included in Aim 2 analyses. Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV. All employed WLWH, who completed WIHS visits between April and October 2018 at four selected Southern sites (Alabama, Georgia, North Carolina, and Mississippi) (n = 171), were under age 65 at the time of the visit (n = 171), and completed the occupational productivity assessment (n =

164) were included in Aim 3 analyses. Selective WIHS sites were chosen to examine Aim 2 based on: (1) the HIV epidemic in the Southern United States and (2) Site willingness to incorporate the Personal Progress Scale-Revised (Johnson et al., 2005) and Stanford Presenteeism Scale-6 (Koopman et al., 2002) into their core visit protocol.

Recruitment. As this study utilized data from an ancillary study, this section of the chapter will describe the recruitment and data collection procedures adhered to by WIHS. WIHS participants were recruited through purposive convenience sampling when women attended HIV-care visits at each site's medical center and outreach to HIV service agencies. Purposeful recruitment strategies have been amended throughout the duration of WIHS to facilitate an overall representative sample of the adult, female population living with HIV and at risk for HIV in the U.S (Adimora et al., 2018). Although eligibility for WIHS has been has been amended at each of the four recruitment waves of the study, the most current enrollment period (2013 – 2015) recruited WLWH between 25 and 60 years of age, who reported the use of highly active antiretroviral therapy (HAART), without the previous use of anti-retroviral therapy (ART) (Adimora et al., 2018). WARH were age-matched and enrolled if they reported high risk exposure during the previous five years (i.e., having sex with a known HIV-positive man; having unprotected sex with three or more men or protected sex with six or more men; having sex for trade; engaging in intravenous drug use or the use of crack, cocaine, heroin, or methamphetamines; being diagnosed with a sexually transmitted infection; or having a partner who reported any of these high-risk activities) (Adimora et al., 2018). . Exclusion criteria included failure to meet inclusion criteria or unwillingness to consent to and

participate in study procedures (Johns Hopkins School of Public Health, 2015). The full inclusion/exclusion details adhered to by WIHS can be found in the Appendix under the document entitled *Study Design*.

Upon identifying potentially eligible participants, physicians and staff approached women in private clinic rooms. If the women expressed interest in WIHS participation, written study information and the contact information of the site's program manager was provided. Only after full informed consent was provided by women interested in participating, would trained study personnel assessed full study eligibility (Johns Hopkins School of Public Health, n.d.). Although human subject protections should be in place for any research participant, WLWH may be particularly vulnerable due to the personal and social contexts associated with HIV-infection, including stigma (Pellowski et al., 2013). WIHS coordinators were trained to protect potential research participant's privacy and confidentiality during the consent process. More details regarding human subject protections will be discussed later in this chapter.

Power analysis. A power analysis was done to ensure appropriateness of sample size in addressing research aims. Power analyses were originally calculated based on previous WIHS attendance, and a historical attrition rate of 10-15% from the previous WIHS visit. For this study, a sample size of 1,500 WLWH and 600 WARH was estimated to be available for Aim 1 and Aim 2 analyses. For bivariate correlations, the acceptable ration of cases to model coefficients should be at least 20:1 (F, 2015; Meyers LS, 2006). Based on this guideline, the review of the literature, and the conceptual model guiding this dissertation; 24 variables of interest were chosen to address Aim 1, with an

expected ration of 1:62 for WLWH and 1:25 for WARH. Following the same guideline, eight variables were selected to address Aim 2, with an expected ration of 1:75.

An estimated sample size of 184 employed WLWH were predicted to be available for Aim 3 analysis. For multivariable regression modeling, maintaining a ration of at least 10 observations per coefficient is recommended. Based on this guideline, the review of the literature, and the conceptual model guiding this study; 10 variables were chosen to address Aim 3. For a sample size of 184, at an alpha=.05 and with 80% power, the detectable effect size f^2 is .124 (equivalent to R^2=.11, or 11% of the variance of the outcome explained by the model), which is considered a medium effect size. The planned sample size was, therefore, more than adequate to evaluate the bivariate and covariate relationships between the variables of interest.

In general, alternative plans to adhere to recruitment goals are recommended so that the sample size is adequate to detect significance in accordance with set guidelines. However, data collection for this study occurred through the WIHS study, and, therefore, recruitment strategies were not amendable to change. Therefore, power analyses were re-assessed with the actual sample size available for Aim 1 -3 analyses, which is reflected in the following paragraph.

An actual sample size of 1,357 WLWH and 560 WARH were available to examine the bivariate associations between socioeconomic, psychosocial, and health-related contexts and employment status in Aim 1, with an acceptable ration of 56:1 for WLWH and 23:1 for WARH. An actual sample size of 560 WARH was available to examine the bivariate associations between employment and HIV-specific outcomes in Aim 2, with an acceptable ration of 1:70. Finally, an actual sample size of 164 employed

WLWH were available to examine the multivariable relationships between socioeconomic, psychosocial, and health-related contexts, and occupational productivity in Aim 3, with an acceptable ration of 1:10. Therefore, all variables of interest planned for this research were able to be included in the final design.

Data collection. Based on the results of the comprehensive literature review and conceptual model guiding this study, the variables/concepts of interest presented in Table 1 were used to evaluate the quantitative aims of this study. Specific Aim 1 sought to examine the relationships between socioeconomic, psychosocial, and health-related context and employment in WLWH and WARH. Specific Aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH. Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed women living with HIV. The table below provides the operationalization of variables of interest by study aim, as well as information regarding their appropriateness for use in this study. Additional information regarding reliability and validity will be provided later in this chapter. The full study instruments used for data collection can also be viewed in the Appendix. In addition to the study instruments listed below, individual item responses from existing WIHS data were analyzed to assess: socioeconomic status, housing security, abuse, childcare responsibility, utilization of services, medication adherence, and employment. The individual questions used to assess these variables can be viewed in the Appendix under the document entitled *Variables of Interest Assessed Through Line Item Responses*. All quantitative data collection for this study occurred between April and October 2018.

Table 2. Operationalization of Variables of Interest by Study Aim

Aim	Variable & Operationalization	Reliability/Validity/Specificity
1	**Anxiety** Generalized Anxiety Disorder- 7 item Scale (Spitzer et al., 2006)	• Construct validity established through literature review. Concurrent validity with GAD and clinical cut-offs for anxiety Adequate reliability established in the general and psychiatric clinical populations, across multiple races, genders, and income levels (Lowe et al., 2008; Spitzer et al., 2006).
1, 3	**Depression** Center for Epidemiological Studies-Depression Scale (Radloff, 1977)	• Construct validity established through literature review. Concurrent validity with clinical depression scores and self-report (Radloff, 1977).Adequate reliability established in the general and psychiatric clinical populations, across multiple races, gender, and income levels, and among WLWH (Adams et al., 2018; Rehm & Konkle-Parker, 2016).
1, 3	**Perceived Stress** Perceived Stress Survey (Cohen et al., 1983)	• Construct validity established through literature review. Concurrent validity with multiple depression and anxiety scales. Adequate reliability established in the general population, across multiple races, and health impairments, including WLWH (Cohen et al., 1983).
1, 3	**Social Support** Tangible and Emotional Support subscales of MOS Social Support Survey (Sherbourne & Stewart, 1991)	• Construct validity established through literature review Adequate reliability established in multiple races and in patients with chronic disease, including WLWH (Health; Sherbourne & Stewart, 1991).
1, 3	**Global Neurocognitive Rating** HVLT-R, Trail Making Test Part B, Stroop Test, Symbol Digit Modalities Test (Arbuthnott & Frank, 2000; Lezak, 2004; Shapiro et al., 1999; Stroop, 1935)	• Construct validity of test battery established by WIHS investigators and neurological AIDS experts. Concurrent validity established by comparison with Multicenter AIDS Cohort Study. Reliability established in WLWH (Antinori et al., 2007; Maki et al., 2009; Maki et al., 2015)
2	**Internalized HIV Stigma** HIV Stigma Scale (Berger, 2001)	• Construct validity established through literature review. Concurrent validity with Berger HIV Stigma Scale and Van Rie HIV-related Stigma Scale. Adequate reliability established in PLWH in the U.S., including women (Kipp et al., 2015; Varni, Miller, & Solomon, 2012).

2	**Viral Load** HIV RNA copies/ml	• The Nuclisens HIV-1 QT assay can detect viral load between 80 and 3.47x106 copies/ml (Ludema et al., 2016)
3	**Empowerment** Personal Progress Scale-Revised (Johnson et al., 2005)	• Construct validity established through literature review. Concurrent validity with the Autonomy, Self-Acceptance, and Total Wellbeing scales of the Short Forms of Scales of Psychological Wellbeing (*which reflect the construct of empowerment) Adequate reliability established in women across multiple races, education levels, employment status, and in women with a history of abuse (Johnson et al., 2005; Wright et al., 2010).
3	**Occupational Productivity** Stanford Presenteeism Scale-6 (Koopman et al., 2002)	• Construct validity established through literature review. Concurrent validity with SPS-32, other work-productivity questionnaires, and self-reported productivity measures (Beaton et al., 2010). Adequate reliability established across multiple races, education levels, and in individuals living with chronic disease, including women (Koopman et al., 2002).

Following informed consent and eligibility confirmation, trained WIHS personnel verbally administered study instruments to facilitate comprehension and completeness of data. Study interviews were conducted in private clinic rooms throughout participating WIHS sites. Participant responses were entered into the secure WIHS electronic database in real-time. The WIHS database was safe-guarded to alert the user for any contradictory responses based on previous entries, which facilitated accurate data collection. To promote consistency of data collection and minimize response bias, all WIHS personnel responsible for conducting study interviews received comprehensive interview training, and underwent yearly evaluation to re-assess protocol compliance. In addition to comprehensive training, all personnel were responsible for and had access to question-by-question specifications accompanying each data collection form to clarify terminology and provide strategies for potential dilemmas specific to each data point (Johns Hopkins School of Public Health, n.d.). WIHS guidelines for conducting study interviews can be found in the Appendix.

Data analysis. Quantitative data for this research study was collected through the ancillary WIHS study. There are both benefits and limitations associated with ancillary data analysis. Benefits of ancillary data analysis included access to a larger population without the costs and lengthy timeline traditionally associated with primary data collection. Limitations of ancillary data analysis included that there was less control over study procedures and methodologies chosen. For instance, there was little control over instrument selection and recruitment techniques for this study in order to achieve the

benefits associated with ancillary data analysis (Polit & Beck, 2017). However, the benefits and limitations of using ancillary data were carefully weighed in consideration of the WIHS and current study's goals to ensure the approach selected was appropriate. For this study, ancillary data analysis was appropriate as both the research population within WIHS and study instruments implemented were appropriate to answer the research questions associated with this study. Because data collection and the initial cleaning of data occurred under the WIHS ancillary study, this section of the chapter will describe the data analysis procedures adhered to by WIHS. This information will be followed by details of my own analysis plan.

WIHS maintains an internal data management team (WDMAC), which codes and cleans all study data before releasing it for analysis. WDMAC coded items using specific scale instructions, and both individual item scores and total instrument scores were provided through a secure portal. Data entry occurred in real-time through an electronic data system, and missing values were not accepted except to indicate patient refusal to answer. Participant refusal to answer was coded so that randomness could be assessed. The data set that was used for Aims 1- 3 were cleaned by WDMAC and available for release as of June 2018.

Upon release of the dataset, data was downloaded onto secure, password protected UAB computers. Distribution of data was assessed so that appropriate statistical methods were selected (Polit & Beck, 2017). Missing data was evaluated for randomness and based on this evaluation, strategies to address the missing data will implemented, which included imputation or deletion (Dziura, Post, Zhao, Fu, & Peduzzi, 2013). Specific Aim 1 sought to examine the relationships between socioeconomic,

psychosocial, and health-related context and employment in WLWH (n = 1357) and WARH (n = 560). Specific Aim 2 sought to examine the relationships between employment and HIV-specific outcomes in WLWH (n = 1357). Aims 1 and 2 were descriptive and correlational in nature. Therefore, descriptive statistics were conducted to portray the overall picture of the research sample, thus allowing for inferences related to generalizability (Polit & Beck, 2017). Bivariate correlations were also conducted to examine the direction and magnitude of relationship between socioeconomic, psychosocial, and health-related variables of interest, employment, and HIV-specific outcomes (See Table 1). Specific Aim 3 sought to examine the impact of socioeconomic, psychosocial, and health contexts on occupational productivity in employed WLWH (n = 164). Simultaneous multiple regression analysis and hierarchical multiple regression analysis (based on a priori literature review) was completed to examine the multivariable influence of socioeconomic, psychosocial, and health-related context on occupational productivity in employed WLWH. Data analyses for Aims 1 – 3 of this study were completed between June and October 2019.

Human Subjects Protections. This proposed study was approved by the University of Alabama at Birmingham's (UAB) Institutional Review Board. Each WIHS site was also responsible for initial and ongoing IRB approval. All recruitment and study visits occurred in private environments where conversations were not likely to be overheard. Anonymity was protected through the use of non-identifying study IDs. Data sharing occurred through secured drop-boxes with access limited to those directly involved in the study. The approximate time to complete WIHS procedures during a

single study visit was two hours. To reimburse participants for time and travel, WIHS participants received $60 at the completion of each study visit, plus up to $60 to reimburse travel expenses.

Reliability and Validity. The purpose of the quantitative phase of the proposed study was to examine the relationships between : (1) Socioeconomic, psychosocial, and health-related context and employment among WLWH and WARH in the United States; (2) HIV-specific outcomes and employment among WLWH; and (3) socioeconomic, psychosocial, and health-related context and occupational productivity among employed WLWH. However, an inappropriate selection of data collection instruments would have resulted in an impaired ability to answer study aims adequately (Polit & Beck, 2017). Therefore, the reliability and validity, or sensitivity of instruments used were considered carefully to protect the internal validity of this study. The validity and reliability of the instruments used in this research are presented in Table 1, which was presented previously in this chapter.

In addition to study instrument selection, data analysis procedures were carefully considered and chosen for their ability to adequately address research aims. Based on the study aims and research questions, the data analysis procedures proposed were appropriate. Therefore, the use of an appropriate sample, psychometrically validates instruments, and statistical techniques appropriate to answer the research questions strengthened this study's internal validity; and thus, strength in the real world (Polit & Beck, 2017).

Phase II: Qualitative Aim

The purpose of the qualitative phase of this study was to explore the significance, lived experience, and contexts surrounding employment for WLWH. In order to best address the lived experience and meaning attributed to employment for this population, an interpretive, or hermeneutic phenomenological approach was used (Wojnar & Swanson, 2007). This section of the chapter will provide the study procedures used to address the qualitative aim of this study. Specifically, this section will address the study sampling procedures, data collection and analysis plans, and measures used to ensure rigor and credibility.

Study population and sample. The qualitative phase of this study occurred as an ancillary study to WIHS, whose population is largely representative of the adult, female population living with HIV and at risk for HIV in the U.S. The most appropriate population to address the qualitative aim of this study was all employed WLWH in the U.S. However, this study recruited from a convenience sample of WIHS participants who had previously completed Specific Aim 3 study procedures. Therefore, all HIV-infected, employed women across WIHS Southern sites (Alabama, Georgia, North Carolina, and Mississippi) who completed WIHS visits between April and October 2018 were included, using purposive sampling strategies to address Aim 4. Recall that Aim 3 was limited in its sampling strategy related to: (1) The current HIV epidemic in the Southern U.S. and (2) Site willingness to incorporate the Personal Progress Scale-Revised (Johnson et al.,

2005) and Stanford Presenteeism Scale-6 (Koopman et al., 2002) into their core visit protocol.

To address Specific Aim 4, a purposive sampling technique was used to recruit employed WLWH (n = 29), stratified across participating WIHS sites. Inclusion criteria included: (1) Current enrollment in WIHS; (2) completion of WIHS visit pertaining to Aim 3; (3) ability to speak and understand English; (4) HIV-positive serostatus; and (4) employment, as defined by the woman. Exclusion criteria included unwillingness to provide consent for study procedures and failure to meet inclusion criteria. The sample size was chosen based on its ability to provide data saturation within the scope of research interviews (Onwuegbuzie & Collins, 2007).

Recruitment. Access was gained to this study's sample through the submission and approval of a concept sheet to WIHS, documenting the research presented within this study (See Appendix). The four Southern sites, which agreed to participate in Specific Aim 3, facilitated the recruitment of participants for Specific Aim 4. Project directors from each participating site were contacted to request assistance identifying potential participants who met criteria. Due to recruitment being conducted through the ancillary WIHS study and facilitated by project directors who were familiar with the study population, difficulty in recruitment was not anticipated. However, snowballing was considered as an additional recruitment strategy in the case that planned enrollment did not occur in a timely manner (Creswell & Poth, 2018).

Project directors were provided the IRB approved interview questions to facilitate understanding of Specific Aim 4, as well as the WIHS concept sheet approval and UAB

IRB approval. Recruitment flyers and an Informed Consent Information Sheet was also provided. Flyers were displayed in rooms where WIHS visits were conducted. Project directors were instructed to distribute the Informed Consent Information Sheet, along with my contact information, to any interested parties. Upon contact, the full informed consent process was initiated, with study procedures occurring after full informed consent had been provided.

The informed consent process occurred via phone, except in the case of one site (Mississippi), whose IRB preferred local site staff to conduct the informed consent process in person. Potential participants were provided an Informed Consent Information Sheet to facilitate the interview process and enhance understanding. After all questions were addressed, and upon expressing understanding and willingness to participate, informed consent was provided by participants verbally and documented in writing by the person conducting the informed consent process. I (Jenni Wise) personally conducted all interviews related to this study.

Data collection. Qualitative data was collected for this study through semi-focused interviews. Interviews were conducted via phone, at the convenience of the participant, and lasted approximately 45 minutes. The interview questions can be found in the table below.

Table 3. Qualitative Interview Script

Item	Question
1	• I'm going to ask you questions related to how your life affects your job and what your job means to you. First, let's start with the basics. What does work mean to you personally? I'd like you to describe how work adds to your value or worth as a person, or is it more of a means to an end for you?
2	• What do you do for work? What kind of tasks do you do on a daily basis? What kind of hours do you work?
3	• Tell me how you made the decision to accept your current job. What about the job was most appealing to you?
4	• Since you've been working, what are your reasons for staying with the job? What kind of benefits does working provide you outside of money?
5	• Can you describe some of the work-related challenges you face? What techniques or strategies have you used to handle them?
6	• Do you have reliable transportation? What kind? If no, how do you manage getting to and from your job? How does that affect your ability to work?
7	• Tell me about what you've had to give up personally in order to work. How do you balance work with other important things in your life? I'd like you to describe your current work-life balance.
8	• What are your responsibilities to take care of outside of work? Can you tell me how you manage those responsibilities? Can you tell me about a situation where you couldn't manage your real-life responsibilities because of your work? What did you do?
9	• How has living with HIV affected your work? Has working affected your medications? Has working affected your doctor's appointments? How have you managed?
10	• Please describe how your family or friends support or hinder your ability to work. What have you done to help find support or how have you handled friends and family if they have hindered you working? Tell me about that.
11	• I'd like you to describe any accommodations your work provides to help make life easier for you? For example, do they allow for flexible scheduling or shifts, or are they flexible with your doctor's appointments and other important things that come up in life? Tell me about a time you had to speak up for yourself or use certain strategies to get work to accommodate your needs. Do you feel like you can speak up at work? Tell me more about that.
12	• Please describe any arrangements that help balance your work and personal lives. This includes things like childcare, support from family and friends, doctor visits, and time for you.
13	• Overall, do you feel like you have more control or less control over your life because of your job? I'd like you to tell me about at least one example when you felt this way.

All research interviews were conducted in a private environment where confidentiality was protected. The participant was advised prior to the interview to select a location that was both comfortable and allowed for privacy. Interviews were recorded and transcribed verbatim by a professional transcription service to allow for timely completion of this dissertation. Upon receipt from the transcription company, all qualitative files were stored securely on password protected encrypted computers with limited access. Additional information regarding procedures to provide human subject research protections will be provided later in this chapter. Interviews occurred at a single time point, and occur only after the participant had provided informed consent, and completed all study Aim 3 procedures.

Data analysis. Qualitative semi-focused interviews were analyzed using a hermeneutic phenomenology approach to explore the significance, lived experience, and contexts surrounding employment for WLWH (Creswell & Poth, 2018). Hermeneutic phenomenology is concerned with the interpretation and meaning attributed to a phenomenon. Further, it is based on the belief that our interpretation cannot exist without deeper context, making semi-focused, individual interviews highly suitable for addressing the aim of our qualitative analysis (Wojnar & Swanson, 2007).

Data analysis occurred in steps, so that themes emerged naturally as interpretive understanding progressed. A separate coder (C.O.) worked independently and collaboratively with me during the analysis process to allow for inter-rater reliability and enhance overall trustworthiness of the data (Morse, 2015; Wojnar & Swanson, 2007). Initially, scripts were read holistically to gather a general feel for the data (Reiners, 2012). Theories present in the literature as well as the data itself were then used to form

initial categories (Merriam, 2009). Initial categories were constantly compared and contrasted to coding decisions moving forward to ensure appropriate fit. A shift from the initial categories was not viewed as negative or positive, so long as they were purposeful to better representative the experience and meaning attributed to employment, as well as the contexts surrounding employment among employed WLWH (Merriam, 2009; Wojnar & Swanson, 2007). To remain true to the hermeneutic phenomenological tradition, a great deal of awareness and reflexivity was practiced during analysis to allow for the construction of a reality that considers both the researcher's and informant's worldview (Creswell & Poth, 2016; Morse, 2015; Wojnar & Swanson, 2007).

Coding decisions and any transformations of categories during coding were documented through an audit trail to enhance study rigor (Creswell & Poth, 2016). Data analysis occurred in a timely manner upon receipt of transcribed data, so that adjustments could be made to the interview guide, if necessary, to elicit the data required for the study's purpose (Merriam, 2009). However, no changes to the interview script were necessary after recruitment was initiated for this study. This may be because the interview script was pilot tested among two employed WLWH, prior to the start of this study. Feedback was used to modify the interview script prior to participant recruitment.

Human subject protections. Although all human subjects must be provided research protections (OHRP, 1979), WLWH may be particularly vulnerable due to the personal and social contexts associated with HIV infection (Pellowski et al., 2013). Further, employed WLWH may experience additional role strain from participating in this trial, making succinctness of interview and flexibility in scheduling particularly

important to not overburden the participant (Dziak et al., 2010; Mellner, Krantz, & Lundberg, 2006).

This study was approved by the University of Alabama at Birmingham's (UAB) Institutional Review Board (See Appendix for Human Subjects Protocol and IRB Approval). All recruitment and study visits occur in private environments, where conversations were not likely to be overheard. Participants taking part in qualitative interviews were provided the option to choose a pseudo name. Regardless of their choice, all identifiers provided during study interviews were deleted immediately upon receipt of transcribed data. Additionally, transcribed data was stored on password-protected, encrypted computers with limited access. The total estimated time to complete each qualitative interview was 45 minutes. To reimburse participants for their time, a $30 check was mailed immediately following interview completion.

Rigor and credibility. Credibility refers to the trustworthiness of qualitative research findings and is affected by both procedural and methodological rigor (Creswell & Poth, 2016). For credibility to be assessed, the researcher must clearly describe and maintain record of research procedures and decisions in an auditable format (Marshall & Rossman, 2016). Without appropriate rigor and credibility, research findings may be inappropriate to address the research question.

Methodological rigor was established in this study in that there was congruence and logic demonstrated between the research purpose, aims, design, and methodology chosen (Creswell & Poth, 2018). Procedural rigor was evident in the proposed research in that: (1) Hermeneutic phenomenological approach was adhered to; (2) research decisions

were easily traceable through the use of memo-ing and audit trails; and (3) data collection occurred until data saturation was evident (Creswell &Poth, 2018; Morse, 2015). Credibility of the research was also enhanced through the use of: (1) During interview member checking; (2) thick description; and (3) researcher reflexivity (Creswell &Poth, 2018; Merriam, 2009; Morse, 2015).

Summary

The purpose of this chapter was to describe the research methodology used to examine the relationships between: (1) Socioeconomic, psychosocial, and health-related contexts, and employment in WLWH and WARH; (2) HIV-specific outcomes and employment in WLWH; and (3) socioeconomic, psychosocial, and health-related contexts and occupational productivity in employed WLWH. Further, this chapter addressed the qualitative methodology used to explore the lived experience, meaning attributed to, and contexts surrounding employment in employed WLWH. Based on the research problem, current state of the evidence, and study aims, a mixed methods design was selected to best address the aims of this research. Quantitative and qualitative phases occurred concurrently, with each phase informing the interpretation of the other, and adding depth of insight into the research problem. The quantitative phase consisted of survey, clinical, and laboratory based-data collected as part of the ancillary WIHS study. The qualitative phase consisted of semi-focused interviews among employed WLWH, who had participated in the quantitative phase. Both phases were included in this research design to allow for complementarity and triangulation of data. The results of the

quantitative and qualitative aims of this study will be presented in Chapter 4, as presented through three manuscripts.

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EMPLOYMENTAND OCCUPATIONAL PRODUCTIVITY AMONG WOMEN LIVING WITH HIV: A CONCEPTUAL FRAMEWORK

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ABSTRACT

Women living with HIV (WLWH) are particularly vulnerable to unfavorable occupational outcomes compared to both the general population and men living with HIV. These disparities have an impact on physical, psychological, and socioeconomic outcomes, and may compound the disadvantages associated with living with HIV. While the past literature has focused on clinical factors associated with living with HIV and occupational outcomes, more recent evidence suggests that socioeconomic and psychosocial factors associated with living with HIV should be included for a more comprehensive view. Based on this broader inclusion, a conceptual framework is presented describing how socioeconomic and psychosocial characteristics influence employment acquisition and maintenance among WLWH. This framework posits that there is a reciprocal relationship between employment acquisition and occupational productivity on one end, and psychological health, physical health, social support, and empowerment on the other end, with great interactivity between each domain. Implications for future research and interventions include: 1) An extended conceptualization of vocational rehabilitation, which facilitates awareness, and practice skill sets needed to be assertive when navigating challenging workplace environments, and 2) the use of strategic peer support groups to increase social capital, empowerment, knowledge, and resources among WLWH.

Keywords: Employment, Social Determinant, Disparity, Productivity, HIV

Employment is recognized as a social determinant of health influencing economic stability, access to health care, and both physical and psychological health (Foundation, 2013). For people living with HIV (PLWH), employment is predictive of improved HIV care management and may counter the negative socioeconomic consequences associated with living with HIV (Gómez et al., 2016; Hergenrather, Zeglin, Conyers, Misrok, & Rhodes, 2016; Pellowski et al., 2013). Yet, in spite of the benefits of employment, an estimated 60% of PLWH are not employed (Conyers, 2011; Institute of Medicine, 2010; Rabkin et al., 2004), creating disparities related to the many benefits associated with employment, and thereby, impacting the 1.1 million PLWH in the United States (U.S.), their families, and communities (Centers for Disease Control and Prevention; Kaori Fujishiro, 2017; NIOSH, 2017)

When the HIV epidemic debuted in the U.S. in 1981, the lack of availability of effective medicines to control viral replication made unemployment and disability a natural course post-diagnosis. However, in 1995 the approval of Saquinavir® made combination antiretroviral therapy (cART) to treat HIV infection possible, and HIV-related morbidities and mortality began to decrease rapidly. How HIV-infection was viewed in the U.S. changed forever. With prompt diagnosis and adherence to care, PLWH could now live with a sense of normalcy (Henry J Kaiser Family Foundation, 2018). In addition, when Atripla®, the first once-a-day cART, became available in 2006, HIV viral suppression became even more attainable, as PLWH could now take a single tablet, fixed-dose combination medication, with a minimized side effect profile (Aldir et al., 2014; Desai, Iyer, & Dikshit, 2012). Today, HIV is no longer considered a disability. Most PLWH are able to work and need to work, raising increasing concerns for

occupational disparities within a population already disadvantaged by their socioeconomic context (Conyers, 2011; Institute of Medicine, 2010; Pellowski et al., 2013).

For PLWH, these occupational disparities may exist, in part, due to disparities in the socioeconomic environment (i.e., power, resources, and money), misunderstanding regarding HIV-infection, and employers' fears of occupational productivity losses, stemming from long-term lapses in employment and long-term disability enrollment among PLWH (Louvet, 2007; Rabkin et al., 2004; Wagener et al., 2014). While the literature has traditionally pivoted on the health-related factors associated with living with HIV, more recent evidence suggests that socioeconomic and psychosocial factors associated with HIV should be included for a more comprehensive view of the factors influencing occupational disparities among this population (Garrow, 2016; Gosselin et al., 2013). Women living with HIV (WLWH), in particular, are especially vulnerable to both occupational and socioeconomic disparities, making the relationship between socioeconomic environment and occupational disparities of particular concern (Dale et al., 2014; Dray-Spira et al., 2008). Specifically, gender-based differences in socioeconomic and psychosocial contexts may influence hirability, occupational productivity, and job maintenance among WLWH (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Macsinga et al., 2015; McGregor et al., 2014; van Scheppingen et al., 2013; van Servellen et al., 2002; Varekamp et al., 2011). Yet, there remain notable gaps in the literature highlighting the mechanisms for employment and occupational productivity among WLWH.

Understanding the socioeconomic and psychosocial contexts influencing employment and productivity is critical to the development of future interventions and policies to improve occupational outcomes, clinical outcomes, and quality of life among WLWH. Moreover, with over a quarter million WLWH in the U.S., understanding these links is likely to demonstrate substantial social and economic benefit to our communities. Therefore, the purpose of this article is to provide a synthesis of the current literature on the socioeconomic, psychosocial, and health-related contexts influencing employment and occupational productivity among WLWH. Utilizing the literature and existing theory, a conceptual framework will be presented to explain the influence and interplay of the multi-dimensional contexts influencing employment and occupational productivity among this vulnerable population.

A Review of the Literature

HIV infection is a socioeconomic disease, meaning that socioeconomic disparities are highly prevalent among PLWH, including inadequate access to stable housing, transportation, education, and health care (Gosselin et al., 2013). WLWH are particularly vulnerable to socioeconomic disparities and disadvantage, secondary to culturally placed stigma based on their gender, race, HIV status, and the related increase of social isolation and abuse (Pellowski et al., 2013). Cumulatively and chronically, these environmental contexts influence not only the opportunities available to WLWH, but their perceptions of opportunities, and their ability to leverage them. According to the Transactional Theory of Stress and Coping, psychosocial and socioeconomic context impact how people view their environments, including their ability to manage difficult situations

(Henry J Kaiser Family Foundation, 2018). When people are able to navigate, or effectively manage their environment through either problem-solving or emotional coping, stress is minimal. Alternatively, when there is a perceived or actual inability to manage the environment, excessive stress occurs, manifesting through physical, psychological, and behavioral changes thereby impacting all areas of life, including employment (Pellowski et al., 2013). In the context of WLWH that means, a multitude of discouraging socioeconomic and psychosocial factors likely influence the ability to manage the socioeconomic environment, influencing access to employment, occupational productivity, and job maintenance. In the next section, the literature is employed to frame the mechanisms by which socioeconomic, psychosocial, and health contexts influence employment outcomes among WLWH. The Transactional Model of Stress and Coping is utilized as a framework to illustrate the impact of socioeconomic and psychosocial contexts on occupational outcomes among WLWH.

Factors associated with Employment and Occupational Productivity among WLWH

The socioeconomic environment reflects the distribution of power, resources, and money available for use, and determines how individuals meet their basic needs (Collaborative on Health and the Environment, 2019). The literature reflects that the socioeconomic environment influences physical health, psychological health, social support, and overall empowerment. Thus, for WLWH, disparities in the socioeconomic environment lend themselves to disparities within each of these critical domains. Notably, the evidence supports that employment is associated with socioeconomic, psychosocial, and health-related contexts. Thus, the socioeconomic environment of

WLWH negatively impacts employment among WLWH. However, the evidence also suggests that the relationships between employment and socioeconomic, psychosocial, and health contexts are reciprocal. Thus, improving access to employment is likely to yield substantial benefit to WLWH across each of these domains.

Occupational productivity is a critical factor influencing employment acquisition and maintenance, and is evaluated by both quantity and quality of work production. The literature reflects that occupational productivity is affected by the ability to complete tasks and avoid distractions while at work; (Koopman et al., 2002) and is influenced by physical and psychological health, access to adequate social support, and the attitudes, thoughts, and behaviors associated with empowerment. Thus, the socioeconomic environment of WLWH may negatively influence both access to employment and job maintenance. Yet, the mechanisms by which the socioeconomic environment influences employment and occupational productivity, and thus job maintenance, in WLWH are largely undocumented. In the following section, the mechanisms by which physical health, psychological health, social support, and empowerment influence employment outcomes within this vulnerable population are described.

Physical Health

Physical health exists on a spectrum of functionality. When in good health, bodies function as intended; and bones, muscles, organs, and neurohormonal signaling interact in a way for maximal efficiency. However, as bodies are exposed to environmental stressors (physical or psychological), the ability to adapt and maintain resiliency are tested over time, eventually leading to impairments in function which manifest as injury

or disease (Brüssow, 2013; Matthews & Gallo, 2011). Several things can impact the body's ability to withstand the test of time, including upkeep (i.e., exercise and nutrition), access and adherence to health care, and exposure to environmental toxins (Brüssow, 2013; Matthews & Gallo, 2011). The ability to effectively manage psychological distress impacts physical health, as chronic psychological stress can lead to impairments in the body's physical systems (Matthews & Gallo, 2011). Thus, for people of low socioeconomic status, such as WLWH, the cumulative impact of low socioeconomic status (i.e., poverty, housing and food instability, poor access to health care) negatively impacts the body's ability to remain resilient in response to stressors, negatively impacting physical health (Pellowski et al., 2013; Turan et al., 2016)

Whether these impairments to physical health are acute or chronic in nature, they impact the ability to effectively manage and function in our lives, engage with others, and the capacity for employment (Brüssow, 2013). Among individuals who are employed, symptom burden from chronic health impairments may influence occupational productivity by altering the effort required to complete tasks at work (i.e., fatigue, weakness) and increased distractions from work (i.e., pain, medication side effects). Indirectly, impairments in physical health also influence psychological health when they interfere with the ability to function as a contributing member of society (such as through employment), exercise self-determination, or engage in cognitively stimulating activities (Wagner, Holloway, Ghosh-Dastidar, Kityo, & Mugyenyi, 2011; Watkins & Treisman, 2015). For example, Vance and colleagues suggested that the physical and social work environment are cognitively stimulating, and engaging in such promotes optimal cognitive health (Vance et al., 2015). Yet, impairments in physical health may limit the

ability to engage in and be productive at work, thus creating a negative cycle between physical health, cognitive health, and employment (Dray-Spira, Gueguen, Ravaud, & Lert, 2007).

Thus, socioeconomic contexts, among WLWH, influence employment and occupational productivity through their impact on physical health and the functional capacity to complete tasks and avoid distractions at work. Moreover, the effects of impaired physical health exert influence over psychological (and cognitive) health when they interfere with the ability to engage with others, fulfill role expectations, and derive purpose from life (Wagner et al., 2011). Whereas functional capacity impairments directly limit the ability to perform certain tasks, psychological impairments influence attitudes, perception, and reaction to the environment, impacting employment and productivity through changes in motivation and behavior.

Psychological Health

Psychological health encompasses emotional wellbeing and cognitive function. It affects coping with stressors, making decisions, problem solving, and engaging with others (Dale et al., 2014). Psychological health is impacted by impairments in physical health, vulnerability in the socioeconomic environment, and whether or not an individual perceives social support to be available during challenging times (Centers for Disease Control and Prevention). Similar to maintenance of good physical health, good psychological health is contingent on the ability to adapt and grow (i.e., maintain resilience) in challenging psychological environments. For example, when an individual is able to problem solve or cope effectively with distressing situations, personal growth is

achieved and positive coping skills are internalized, which contribute to the effective management of challenging scenarios in the future. However, when distressing situations are ineffectively managed, stress accumulates, frequently leading to impairments in psychological health (i.e., depression and chronic stress) and greater difficulty managing psychological challenges over time (Bielecky et al., 2015; Matthews & Gallo, 2011; van Servellen et al., 2002). Notably, perceived adequacy of social support has demonstrated a positive, protective effect on psychological health through improvements in emotional coping and the availability of resources to help during difficult times (Breet et al., 2014; Sherbourne & Stewart, 1991; Zeligman et al., 2016).

Thus, for WLWH, exposure to multiple life stressors (i.e., poverty, instability, uneven power dynamics, and abuse), and the experience of stigmatization and social isolation negatively influence psychological health, with stress and depression rates 4-5x that of the general population (Brody et al., 2014; Dale et al., 2014; Do et al., 2014; Morrison et al., 2002; Saadat, Behboodi, & Saadat, 2015). Importantly, impairments in psychological health negatively impact employment and productivity while at work (Bielecky et al., 2015; Karlsson et al., 2010). For example, prolonged or severe stress impacts motivation and the ability to concentrate and make decisions (i.e., cognitive function), thus influencing desirability for employment and productivity at work (National Center for Injury Prevention and Control; National Institute of Mental Health). Similarly, depression is supported to negatively impact job acquisition and occupational productivity through its influence on energy levels (or fatigue) and motivation; thereby, influencing the ability for people living with depression to set and achieve work-related goals (National Institute of Mental Health).

Although impairments in psychological health are suggested to negatively impact employment outcomes among WLWH, the reverse can be said for the impact of employment on psychological health. For instance, employment has been associated with greater satisfaction and quality of life, secondary to its impact on economic status, self-determination, and derived purpose rom life (Degroote et al., 2014; Leonardi & Scaratti, 2018; Unanue et al., 2017; Vance et al., 2015; Wagener et al., 2014). Thus, collectively, the evidence supports that the relationship between psychological health and employment is reciprocal; and socioeconomic and health contexts influence psychological health, employment, and occupational productivity among WLWH.

Empowerment

Empowerment reflects the ability of an individual to leverage resources in their own, self-determined interests (Johnson et al., 2005). Empowerment is influenced by socioeconomic status (including social capital), as well as personal behaviors, knowledge, and attitudes which influence the ability to acquire these resources (i.e., self-esteem, social intelligence, self-advocacy) (Collaborative on Health and the Environment, 2019; Johnson et al., 2005). Thus, empowerment influences employment through its influence on the overall ability to navigate the environment, acquire employment, and be productive at work. For example, the ability to access and leverage physical, structural, and social resources in the environment (i.e., stable housing, transportation, education, social capital) influence the capability to navigate the environment, employment acquisition, and job maintenance (Pellowski et al., 2013; Ransome et al., 2018; Wright et al., 2010). In particular, the ability to access higher

education is supported to influence employment acquisition and maintenance through the development of knowledge, skillsets, and influential social networks, and greater access to higher quality jobs (Hafner, 2012; Pellowski et al., 2013; R. Dray-Spira, 2007; Vance et al., 2015; Wright et al., 2010). Notably, higher quality jobs, which facilitate empowerment and autonomy in the workplace, have been associated with improved productivity and job maintenance (Chang et al., 2015; Karlsson et al., 2010).

Empowerment also reflects the ability to access and leverage internal resources (i.e., emotional coping techniques and executive problem solving skill sets) which impact the ability to navigate and readily adapt to the environment (Wright et al., 2010). In this manner, empowerment is supported to influence employment access and occupational productivity through its impact on the thoughts and behaviors associated with positive employment outcomes (Breet et al., 2014; Brody et al., 2014; Dale et al., 2014; Degroote et al., 2014; Lazarus, 1984; Pellowski et al., 2013). For example, the ability to effectively manage stress, form cohesive relationships within the workplace, and navigate conflict in the work environment is reflective of personal skillsets, which influence productivity at work through their impact on motivation, efficiency, and resiliency (Davis-Street, Kendrick, Castillejo, & Grimsley, 2016; Johnson et al., 2005; Karlsson et al., 2010; Lazarus, 1984; Macsinga et al., 2015; Varekamp et al., 2011; Wright et al., 2010). Notably, the literature suggests that social support outside of the workplace also influences empowerment through the sharing of resources (i.e., emotional, informational, functional), which impacts the collective “tools” an individual has access to (Breet et al., 2014; Sherbourne & Stewart, 1991; Turan et al., 2016; Zeligman et al., 2016).

Thus for WLWH, the cumulative impact of lower socioeconomic status, reduced social capital, inadequate social support, and impaired psychological health may negatively influence employment and occupational productivity through their impact on empowerment (Frew et al., 2016; Henkel, 2008; Pellowski et al., 2013). Although empowerment affects the ability of WLWH to acquire and maintain employment, WLWH who are employed enjoy higher levels of empowerment through increased financial autonomy, self-determination, and social status (Rothman et al., 2007; Unanue et al., 2017). Thus, empowerment has a reciprocal relationship with employment and occupational productivity; and socioeconomic and psychosocial contexts influence empowerment among WLWH.

Social Support

Social support describes the perceived adequacy of a social network to provide emotional, informational, and functional assistance (Liu et al., 2013; Sherbourne & Stewart, 1991). Whereas emotional support refers to the availability of someone to provide affection, companionship, and encouragement; informational support refers to the availability of someone to provide guidance, advice, and assist with problem-solving. In contrast, functional support describes a more tangible form of support and refers to the availability of someone to help with life's functions, including things like childcare, housekeeping, and the provision of financial assistance (Sherbourne & Stewart, 1991). Through these mechanisms, social support fulfills the need for connectedness and alleviates stress in life by enhancing emotional coping, problem solving, and functional

capacity (Barringer et al., 2017; Kim, Han, Shaw, McTavish, & Gustafson, 2010; Liu et al., 2013).

Importantly, the availability of these support mechanisms also influence employment and occupational productivity through their impact on emotional coping, problem solving, and the overall ability to navigate the environment, including employment. For example, perceived adequacy of social support influences whether positive coping techniques (i.e., positive re-framing and active problem solving) or negative coping techniques (i.e., avoidance) are used in times of stress. Women who perceive adequate social support are more likely to choose positive emotional coping and problem solving strategies, which influence psychological health, thereby, promoting improved employment and occupational productivity outcomes (Degroote et al., 2014; Kim et al., 2010; Leineweber et al., 2012; Liu et al., 2013; Roohafza et al., 2014; Welbourne, Eggerth, Hartley, Andrew, & Sanchez, 2007). Social support also impacts the collective pool of functional and informational resources, which influence the ability to obtain and maintain employment (Barringer et al., 2017; Garrow, 2016; Leineweber et al., 2012; Liu et al., 2013). For example, individuals with greater social resources may have influential social connections that help them attain employment, or someone to help out when work conflicts with other responsibilities, such as childcare.

Thus, for WLWH, inadequacies in social support, stemming from reduced social capital and influences secondary to race, gender, and HIV-stigmatization (Dale et al., 2014); may negatively impact employment and occupational productivity among this population. However, social support not only impacts employment, but physical health, psychological health, and empowerment (through increased access to resources)

(Barringer et al., 2017; Jennifer et al., 2017; Johnson et al., 2005; Liu et al., 2013; Wilson et al., 2018). Thus, the evidence continues to support the interactive influence of the socioeconomic environment on social support, health and wellbeing, and employment and occupational productivity among WLWH.

Presenting a New Conceptual Framework

Thus far, the mechanisms by which socioeconomic and psychosocial contexts affect physical health, psychological health, empowerment, and social support among WLWH have been described. These findings have been framed in context of the Transactional Model of Stress and Coping, which posits that an individual's socioeconomic and psychosocial contexts influence the ability to navigate, or effectively manage, the environment. When the environment is effectively managed (through problem solving, adaptation, and emotional coping), minimal stress occurs and health and wellbeing are protected. However, when the environment cannot be effectively managed (from inadequate access to the internal and external resources necessary for survival), excessive stress occurs resulting in physical, psychological, and behavioral consequences; which make navigation of the environment increasingly difficult. Although the Transactional Model of Stress and Coping is useful for framing the mechanisms by which socioeconomic and psychosocial contexts influence the ability to navigate the environment, it was not intended to explain the contexts influencing access to employment and occupational productivity in WLWH; nor does it account for the unique socioeconomic and psychosocial contexts influencing life among this population.

Therefore, based on the literature, a new framework is presented, which promotes increased understanding of the unique socioeconomic and psychosocial contexts influencing WLWH, and facilitates improved intervention design to reduce occupational disparities among this vulnerable population (Figure 1). The framework poses five main tenets which impact employment acquisition and occupational productivity among WLWH: (1) HIV infection is a socioeconomic disease; (2) socioeconomic contexts shape an individual's view of the environment and the availability of resources necessary to successfully navigate the environment; (3) navigation of the environment is influenced by the availability of the following resources: physical health, psychological health, social support, empowerment; (4) inadequate navigation of the environment, or insufficient adaptation to stressors leads to negative physiological, psychological, and behavioral changes which impair occupational productivity, job maintenance, and employment status; and (5) employment and occupational productivity are beneficial to health; and unemployment and impaired productivity are determinants of poor health.

The adequacy of these resources (physical health, psychological health, empowerment, and social support) promote the ability for WLWH to navigate and adapt to the environment, promoting the acquisition of employment, occupational productivity, and employment maintenance. Whereas, inadequacy of these resources impairs the functional capacity of WLWH to work and limits their access to problem solving and coping techniques necessary to maintain resilience in the face of life's challenges, negatively influencing employment outcomes.

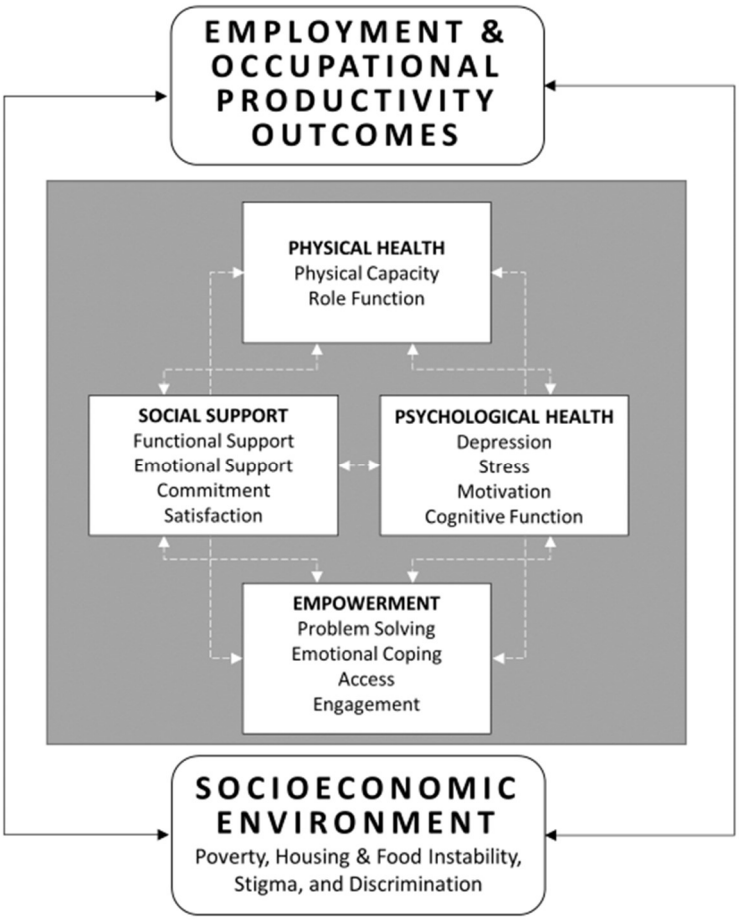

Figure 1. Conceptual Framework of Employment and Occupational Productivity among WLWH

To enhance the application and utility of the newly proposed model, a case of HIV infection, employment, and occupational productivity is presented: Ms. S is a woman in her mid-40s living with HIV. She was diagnosed in 2002 and has received disability income for the majority of her adult life. For the past ten years, she has been virally suppressed, and is interested in working to provide greater independence for

herself and her children. She never attended college, has no-work history, and has a minimal social circle, which influenced her ability to find a job she values and market herself as hirable. Although she considers it normal, her chronic depression has also affected her confidence, motivation, and willingness to advocate for herself, which have negatively influenced the behaviors needed to prepare, seek, and function productively in a job, which would enhance her quality of life. Employment would benefit Ms. S, providing financial independence, personal autonomy, and a greater support network, all leading to improved quality of life and personal empowerment. However, the barriers making it difficult for Ms. S. to acquire employment and be productive at work are difficult to overcome.

In the case of Ms. S., and many WLWH, interventions to address the barriers to acquiring and maintaining employment are needed. However, the proposed model also implies that adequacy of these resources facilitate employment and quality of life among WLWH. Thus, a favorable case of HIV infection, employment, and occupational productivity is presented: Ms. M is a 29 year old woman living with HIV. She was diagnosed in 2010 through routine testing at her local health department. Although learning she had acquired HIV was quite stressful, her best friend and parents were immediately supportive, and helped motivate Ms. M to stay on track. Ms. M never enrolled in disability income, was linked to care immediately, and remains adherent to her HIV-medications. She enrolled at her local university at the age of 20, and graduated from college at the age of 24 with a Bachelor degree in Early Elementary Education. While preparing academically, she met several influential teachers and mentors, who would later help her land her first professional job. Although she still struggles with what

life might be like if she didn't have HIV, her education, friends, and work give her a sense of purpose. Ms. M is more than aware that working has helped her psychological health, and given her a full identity outside of living with HIV. She is appreciative of the experiences (i.e., education, mentorship, and supportive friendships) that have facilitated her ability to be productive and engaged at work, and contribute to the greater community. Furthermore, working has given Ms. M the means to live the way she chooses, enhancing her autonomy and overall empowerment. In this scenario, the availability of structural, personal, and psychosocial resources has facilitated Ms. M's employment and productivity in a high quality job. Her quality of life and health benefit because of her employment.

Discussion

As employment is now recognized as a social determinant of health, it is critical that a comprehensive understanding exists of the contexts impacting acquisition of employment, occupational productivity, and job maintenance among WLWH (Braitstein et al., 2005). Without a greater understanding of the personal and social contexts influencing employment outcomes among WLWH, socioeconomic disparities will continue to negatively impact individual and societal outcomes. The evidence presented implies that future research must recognize and systematically assess the comprehensive personal and social contexts influencing employment outcomes among WLWH, rather than focusing on the clinical impact of HIV infection in isolation. Likewise, policies and interventions aimed to improve occupational outcomes should focus on a comprehensive framework of total worker health, recognizing the impact of both personal and

occupational environments (NIOSH, 2017). In particular, the evidence suggests that future research, interventions, and policies should focus on the promotion of strategies, which empower women and enable them to realize and access the internal and external resources necessary to navigate an environment abundant with hurdles (Barringer et al., 2017; Johnson et al., 2005). Empowerment includes the ability to realize and leverage social, emotional, and physical resources to promote their overall health, wellbeing, and navigation of the environment (Barringer et al., 2017; Johnson et al., 2005; Wright et al., 2010). The first strategy that may prove effective in addressing several of these key areas at once is a systematic social intervention in which peers of mixed empowerment levels develop relationships, and collectively share their resources (i.e., emotional coping, knowledge) that have facilitated their own success in life (Barringer et al., 2017). Strategically including women with higher education status, and more experience navigating the environment allows for women of lesser empowerment to develop peer-to-peer emotional support while expanding the collective pool of knowledge and resources to access (Barringer et al., 2017). A second strategy is to expand the conceptualization of vocational rehabilitation programs to include the skill-sets necessary to not only function in a job, but request accommodations, manage confrontation, and improve efficacy and confidence within the work place setting (Brody et al., 2014; Jennifer et al., 2017; Johnson et al., 2005; Varekamp et al., 2009; Wright et al., 2010).

Conclusion

WLWH are particularly vulnerable to poor employment outcomes, affecting their ability to realize beneficial outcomes and negate overall socioeconomic disparities

(Foundation, 2013; Gómez et al., 2016; Hergenrather et al., 2016). Evidence suggests that gender-based differences in socioeconomic and psychosocial contexts influence occupational outcomes among WLWH (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Liu et al., 2013; Macsinga et al., 2015; van Scheppingen et al., 2015; van Servellen et al., 2002; Varekamp et al., 2011; Wright et al., 2010). Yet, a substantial gap exists in the literature cohesively explaining the mechanisms by which socioeconomic and psychosocial contexts impact occupational outcomes within this population. This work contributes to the literature by proposing a new framework to explain the mechanisms through which the socioeconomic environment impacts occupational outcomes among WLWH, specifically calling for the inclusion of social support and empowerment, in addition to the traditional focus on health-related factors. The knowledge generated from this work will facilitate future interventions and policies to improve self-efficacy, quality of life, and occupational outcomes among WLWH, with substantial social and economic benefit in return.

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SOCIOECONOMIC, PSYCHOSOCIAL, AND HEALTH-RELATED CONTEXTS WITH EMPLOYMENT IN WOMEN LIVING WITH HIV IN THE UNITED STATES

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ABSTRACT

Employment status has been associated with overall quality of life and improved health outcomes. However, employment rates among women living with HIV (WLWH) are estimated at 35%. The purpose of this study was to better understand the socioeconomic, psychosocial, and health contexts associated with employment among WLWH (n = 1373) and women at risk for HIV (WARH) (n = 560) in the United States. Descriptive and inferential statistics were used to evaluate factors associated with employment status. Employment was associated with better socioeconomic status and quality of life (QOL), less tobacco, alcohol, and substance use, and better physical, psychological, and cognitive health. Among WLWH, employment was associated with improved adherence to HIV-care visits and HIV viral load suppression (≤ 200 copies/ml). In multivariable regression modeling, differences were found between WLWH and WARH. Among WLWH, household income, QOL, education, time providing childcare, and lower internalized HIV-stigma remained significantly associated with employment in adjusted multivariable analyses. An increased understanding of the causal pathways between psychosocial and structural factors are needed to address the impact of the socioeconomic environment on employment outcomes among WLWH.

Keywords: Employment, Socioeconomic, Psychosocial, women living with HIV, cohort study

As HIV-infection has transitioned into a chronic, manageable disease, the focus has shifted from acute management of the disease to living and aging successfully with HIV (Vance, Blake, et al., 2019). Employment is key to successful aging in general, and has been associated with improved mental health, physical health, and greater satisfaction with life (Foundation, 2013; Kordovski, Woods, Verduzco, & Beltran, 2017; Vance, Cody, Yoo-Jeong, Jones, & Nicholson, 2015). For many, employment provides purpose and shapes their identity, contributing to greater quality of life (Degroote et al., 2014; Leonardi & Scaratti, 2018; Unanue et al., 2017; Vance et al., 2015; Wagener et al., 2015; Wagener et al., 2014). For people living with HIV (PLWH), employment may counter the negative psychosocial impacts (i.e., depression, social isolation) associated with living with HIV and may be associated with better HIV-associated outcomes (i.e., viral load suppression, reduced morbidity and mortality) (Gómez et al., 2016; Kordovski et al., 2017; Vance, Blake, et al., 2019; Vance et al., 2015). Yet, in spite of the many benefits of employment, the majority of people living with HIV (PLWH) (~ 60%) do not work (Conyers, 2011; Institute of Medicine, 2010; Rabkin et al., 2004).

Although the literature provides evidence that personal, social, and health contexts influence employment, the historical trajectory of HIV-infection has created a unique environment and policies, which impact the ability for PLWH to enter or re-enter the workforce (Garrow, 2016; Gosselin et al., 2013; Hafner, 2012; Okechukwu et al., 2014). While years of disability enrollment, inadequacy of job history, and insufficiency of human resources and networks needed to leverage employment opportunities are thought to have influenced employment acquisition and maintenance among this

population (Verbooy et al., 2018), little is known about the underlying structural and personal contexts which are associated with employment among PLWH.

Furthermore, women living with HIV (WLWH) may have distinctive contexts compared to men living with HIV, which negatively influence their ability to acquire and maintain employment (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Macsinga et al., 2015; McGregor et al., 2014; Unanue et al., 2017; van Scheppingen et al., 2013; van Servellen et al., 2002; Varekamp et al., 2011). Dray-Spira et. al. found that women living with HIV were less likely to be hired and more likely to lose their jobs compared to men living with HIV (Dray-Spira et al., 2008). Although this mimics the pattern reflective of the general population (Organization, 2017), the interactive effect of being a woman living with HIV on employment, considering gender- and race disparities, poor socioeconomic status, and HIV-stigma, have yet to be comprehensively examined. Therefore, the purpose of this study was to examine the comprehensive clinical, personal, and social contexts associated with employment among WLWH. Understanding the characteristics and contexts of employment among WLWH is the first step to designing policies and interventions that aim to reduce occupational disparities among WLWH.

Methods

This study was conducted as a sub-study to the Women's Interagency HIV Study (WIHS). WIHS was created in 1993 in response to the growing HIV-epidemic among women in the United States (U.S.), and currently follows over 2,300 women who are living with or at risk for HIV (Adimora et al., 2018). The WIHS is representative of the

adult, population of WLWH and women at risk for HIV (WARH) in the U.S. and follows participants at nine active sites throughout the U.S. (Adimora et al., 2018) Although eligibility for WIHS has been amended at each of the four recruitment waves of the study, the most current enrollment period recruited WLWH between 25 and 60 years of age, who reported the use of highly active antiretroviral therapy (HAART), without the previous use of anti-retroviral therapy (ART) (Adimora et al., 2018). WARH were age-matched and enrolled if they reported high risk exposure during the previous five years (i.e., having sex with a known HIV-positive man; having unprotected sex with three or more men or protected sex with six or more men; having sex for trade; engaging in intravenous drug use or the use of crack, cocaine, heroin, or methamphetamines; being diagnosed with a sexually transmitted infection; or having a partner who reported any of these high-risk activities) (Adimora et al., 2018). Demographics and criteria for earlier recruitment are described elsewhere (Adimora et al., 2018).

WIHS participants undergo comprehensive study visits every six months to evaluate the clinical, psychological, and socioeconomic impact of living with HIV. Neurocognitive testing is administered every two years, in rotating intervals (Adimora et al., 2018). All women who participated in WIHS visits between April and October 2018 (visit 48), were under 65 years of age, and responded to the WIHS question "Are you currently employed", were included in this analysis. Women 65 years and older were excluded from analyses as they are past the cut-off for traditional working age and may have contexts which would confound the interpretation of the analysis (OECD, 2018).

Clinical Measures

HIV-viral load ≤ 200 copies/ml, CD4 count/mm^3, HIV-therapeutic regimen and adherence, and missed HIV-care appointments were assessed among WLWH through self-report and/or blood draw. General health was assessed by evaluating indicators of hypertension, diabetes, and anemia. Indicators of hypertension and diabetes included elevated clinical readings (blood pressure ≥ 140/90 mmHg; or fasting blood glucose ≥ 126 mg/dl, or hemoglobin A1C value ≥ 6.5%), self-reported diagnosis, or use of medications to control either condition. Anemia was assessed by evaluating hemoglobin and hematocrit laboratory values. Body mass index (kg/m^2) was used as an indicator of obesity. Negative health behaviors previously associated with unemployment were evaluated via self-report, including current smoking status, number of alcoholic drinks per week, and recreational drug use.

Psychological Measures

Among WLWH, internalized negative thoughts and attitudes pertaining to HIV-infection were evaluated via the HIV-Stigma Scale (Berger, 2001). Emotional wellbeing (i.e. symptoms of depression, stress, and anxiety) and perceived adequacy of social support were assessed using the Center for Epidemiological Studies-Depression Scale (Radloff, 1977), Perceived Stress Scale (Cohen et al., 1983), Generalized Anxiety Scale-7 (Spitzer et al., 2006), and the emotional/informational and functional subscales of the MOS Social Support Survey (Sherbourne & Stewart, 1991). Health-related quality of life was assessed though the MOS-HIV scale (Wu, Revicki, Jacobson, & Malitz, 1997). Cognitive health (learning, memory, attention, executive function, psychomotor accuracy

and speed, and verbal function) were assessed using the Hopkins Verbal Learning Test-Revised, Trail Making Test Part B, Stroop Test, Symbol Digit Modalities Test, Grooved Pegboard testing, and semantic and fluency testing. Global scores were created using demographically adjusted scores from each domain for individuals completing at least four domains (Rubin et al., 2017). Scores ranged from 1 to 9, with scores greater than five indicative of cognitive impairment.

Socioeconomic Measures

Age, race, marital status, childcare responsibility, household income, educational attainment, employment status, access to medical insurance, and housing stability were assessed via self-report. Employment was assessed by asking the following question: "Are you currently employed (for pay, full time or part time)". Access to medical insurance was assessed by asking: "Since your last study visit, have you received assistance from the AIDS Drug Assistance Program or any other Ryan White Program" or "Have you had health insurance, such as Blue Cross, Medicaid, or Medicare?" Housing stability was assessed by asking the following two questions: "Where are you living now?" and "How long have you stayed at the place you stayed last night?"

Statistical Analysis

Descriptive statistics were used to characterize variables of interest by employment and HIV status. Inferential statistics, and simple and multivariable regression modeling were used to examine the relationships between variables of interest and employment. SPSS v.24 software was used to conduct all analyses (IBM).

Results

WLWH (*n* = 1463) and WARH (*n* = 619), who attended a routine WIHS visit between October 2017 and March 2018 (visit 48), were included in the original data set. Women who were under 65 years of age (*n* = 1967) and responded to the WIHS question "Are you currently employed?" (*n* = 1933) were included in the final analyses. Tables 1 and 2 describe the clinical, psychological, and socioeconomic characteristics of the women included in the final analyses (*n* = 1933). The majority of women were living with HIV (71%, *n* = 1373) and 29% (*n* = 560) were considered at risk for acquiring HIV-infection. On average, women in our study were 49.8 years of age, African American (71.3%), and unmarried (68.8%). Most (66%) had received a high school diploma, and 34.9 % had attended college. Few (30.4%) reported being responsible for a child younger than 19 years of age, and those who did report childcare responsibilities provided childcare an average 10.9 hours per week. Although most were not employed (59.3%), those reporting employment (37.9%) worked an average of 36.1 hours per week.

Associations between clinical, psychological, and socioeconomic variables of interest and employment were similar between WLWH and WARH (Tables 1 and 2).

Table 1. Continuous Variables of Interest stratified by HIV and Employment Status

	WARH by Employment				**WLWH by Employment**			
	Total	**Yes**	**No**	**Adjusted**	**Total**	**Yes**	**No**	**Adjusted**
	***n*=560**	***n* = 255**	***n* = 305**	**R^2**	***n*=1357**	***n* = 519**	***n* = 838**	**R^2**
	Mean (SD	**Mean (SD)**	**Mean (SD)**		**Mean (SD**	**Mean (SD)**	**Mean (SD)**	
Quality of Life[a]								
Physical Function	70.1 (30.7)	84.4 (21.8)	58.1 (31.9)	0.181**	69.9 (29.2)	83 (22.3)	61.7 (30)	0.125**
Social Function	79.2 (26.9)	88 (20.0)	71.7 (29.6)	0.09**	80.9 (25.5)	89 (19.8)	75.9 (27.3)	0.091**
Pain	69.4 (28.7)	79.3 (21.5)	60.9 (31.3)	0.1**	70 (27.6)	79 (22)	64.3 (29.2)	0.036**
Emotional Wellbeing	71 (25.1)	78.2 (22.0)	65.1 (26)	0.066**	71.3 (24.3)	77.4 (21.8)	67.5 (24.9)	0.062**
Role Function	78.8 (30.2)	91.4 (18.5)	68.2 (33.9)	0.145**	81.6 (26.8)	91.9 (18.5)	75.2 (29.1)	0.066**
Energy/Fatigue	59.6 (26.9)	65.5 (25.4)	54.7 (27.3)	0.038**	61.2 (26.2)	67.6 (24.4)	57.2 (26.5)	0.038**
Quality of Life	68.6 (21.5)	77.9 (15.9)	60.7 (22.5)	0.157**	69.5 (20.6)	78 (16.8)	64.1 (21)	0.107**
Neurocognitive Rating[b]								
Executive Domain	2.7 (1.6)	2.4 (1.2)	2.9 (1.8)	0.026**	2.9 (1.7)	2.5 (1.5)	3.1 (1.8)	0.022**
Speed Domain	2.7 (1.6)	2.5 (1.5)	2.9 (1.7)	0.007*	2.8 (1.6)	2.5 (1.4)	3 (1.7)	0.022**

Attention Domain	2.8 (1.4)	2.7 (1.2)	3 (1.6)	0.013*	3.1 (1.7)	2.8 (1.6)	3.3 (1.7)	0.018**
Learning Domain	2.6 (1.7)	2.4 (1.6)	2.9 (1.8)	0.021*	2.9 (1.9)	2.6 (1.8)	3 (1.9)	0.011**
Memory Domain	2.6 (1.8)	2.2 (1.6)	2.9 (1.9)	0.032**	2.8 (1.9)	2.6 (1.8)	2.9 (1.9)	0.009**
Motor Domain	2.6 (1.8)	2.2 (1.3)	3 (2.1)	0.048**	2.6 (1.8)	2.2 (1.4)	2.9 (1.9)	0.033**
Verbal Domain	2.7 (1.4)	2.6 (1.3)	2.8 (1.5)	0.004	2.9 (1.6)	2.8 (1.6)	3 (1.6)	0.003*
Global Rating	3.4 (1.9)	2.9 (1.6)	3.8 (2)	0.058**	3.6 (1.9)	3.2 (1.7)	3.9 (1.9)	0.036**
Psychological Health								
Emotional/Info. Support[c]	3.99 (1.2)	4.1 (1)	3.9 (1)	0.012*	3.9 (1.2)	4.1 (1.2)	3.8 (1.2)	0.009**
Tangible Support[c]	3.92 (1.4)	4 (1.3)	3.9 (1.2)	0.006*	3.8 (1.4)	4 (1.4)	3.7 (1.4)	0.007**
Depressive Symptoms[d]	12.1 (11.9)	8.4 (9.6)	15.3 (12.7)	0.083**	12.3 (11.7)	8.5 (10)	14.6 (12.1)	0.064**
Anxiety[e]	5.1 (5.7)	3.5 (4.6)	6.4 (6.2)	0.063**	4.8 (5.7)	3.6 (4.8)	5.6 (6)	0.029**
Perceived Stress[f]	24.34 (8.6)	21.4 (7.4)	27 (8.6)	0.105**	23.6 (8.5)	20.9 (8)	25.2 (8.4)	0.060**
Internalized HIV Stigma[g]	-	-	-	-	1.8 (0.7)	1.7 (0.7)	1.8 (0.7)	0.002*
Physical Health								
Age at Visit	48.6 (8.7)	46.2 (8.5)	50.7 (8.4)	0.065**	49.8 (8.4)	48.1 (8.3)	51.6 (7.8)	0.041**
Hemoglobin	12.6 (1.6)	12.5 (1.5)	12.6 (1.7)	0.001	12.6 (1.5)	12.6 (1.4)	12.6 (1.5)	0
Hematocrit	38.8 (4.4)	38.5 (4)	39 (4.6)	0.001	38.7 (4.1)	38.5 (3.6)	38.7 (4.1)	0

Hemoglobin A1C	6.3 (10.9)	5.7 (1.1)	6.8 (14.6)	0.005	6.1 (8.3)	5.7 (1.1)	6.2 (8.9)	0.003*
Body Mass Index (kg/meter^2)	32.9 (8.9)	33.4 (8.8)	32.5 (9.1)	0.001	32.7 (9.1)	32.8 (8.4)	32.5 (9.7)	0
Employment and Childcare								
Number of Children Participant Cares for	0.8 (1.2)	0.9 (1.2)	0.7 (1.2)	0.01	0.6 (1)	0.6 (1.0)	0.5 (1.1)	.001
Hours/Week Providing Childcare	10.5 (7)	10.2 (7.3)	11.1 (7.0)	0.000	11.1 (8)	10.1 (7.7)	12.0 (8.2)	.012*
Hours/Week Participants Works	35.2 (11.8)	-	-	-	36.5 (12.7)	-	-	-

Note: $p \leq .01$**, $p \leq .05$*
MOS-HIV Scale Range is from 0-100, with 100 being best[a].
Neurocognitive ratings greater than 5 indicate impairment[b].
Social support range is from 1-5, with 5 being best[c].
Depressive symptoms: score ≥16 indicates depression[d].
Anxiety symptoms: score ≥10 indicates anxiety[e].
Perceived Stress range is 0-40, with 0 being best[f].
Mean Range is 1-4. Higher scores indicate more internalized stigma.

Table 2. Categorical Variables of Interest stratified by HIV and Employment Status

	WARH by Employment				WLWH by Employment			
	Total ***n*** **= 560**	**Yes** ***n*** **= 255**	**No** ***n*** **= 305**		**Total** ***n*** **= 1367**	**Yes** ***n*** **= 535**	**No** ***n*** **= 838**	
		N (%)	**N (%)**	**Cramer's V**		**N (%)**	**N (%)**	**Cramer's V**
Race								
White	38 (6.8)	20 (7.8)	18 (5.9)	0.069	135 (9.95)	54 (10.4)	81 (9.7)	0.016
Hispanic	85 (15.2)	42 (16.5)	43 (14.1)		179 (13.19)	66 (12.7)	113 (13.5)	
Black/African American	411 (73.4)	184 (72.2)	227 (74.4)		1002 (73.84)	383 (73.8)	619 (73.9)	
Other	26 (4.6)	9 (3.5)	17 (5.6)		41 (3.02)	16 (3.1)	25 (3)	
Highest Education Level								
High School	173 (30.9)	66 (26)	107 (35.1)	0.185**	433 (31.9)	159 (30.6)	274 (32.7)	0.277**
Attended or Graduated College	204 (36.5)	117 (46.1)	87 (28.5)		480 (35.4)	262 (50.5)	218 (26)	
Housing Stability								
House/Apartment	525 (93.8)	245 (96.1)	280 (91.8)	0.107***	1305 (96.2)	512 (98.7)	793 (94.6)	0.102*
6 months of more	478 (91.0)	226 (88.6)	252 (82.6)	0.051	1199 (91.8)	477 (91.9)	722 (86.2)	0.038
Household Income								
≤ 12,000	246 (45.7)	45 (17.6)	201 (65.9)	0.554**	632 (48.8)	100 (19.3)	532 (63.5)	0.509**
12,001-24,000	116 (21.6)	58 (22.7)	58 (19.0)		311 (24.0)	138 (26.6)	173 (20.6)	
24,001-36,000	55 (10.2)	40 (15.7)	15 (4.9)		148 (11.4)	93 (17.9)	55 (6.6)	
36,001-75,000	90 (16.8)	74 (29.0)	16 (5.2)		142 (11.0)	111 (21.4)	31 (3.7)	
≥75,000	31 (5.7)	28 (11.0)	3 (1.0)		62 (4.8)	54 (10.4)	8 (1.0)	

Familial Responsibility								
Married/Living with Partner	164 (30.2)	84 (32.9)	80 (26.2)	0.078	355 (26.8)	165 (31.8)	190 (22.7)	0.16**
Provides Care for own Child	159 (28.4)	99 (38.8)	60 (19.7)	0.274**	286 (20.8)	150 (28.9)	136 (16.2)	0.17*
Exposure to Abuse[a]								
Serious Physical Abuse	14 (2.5)	5 (2)	9 (3.0)	0.032	20 (1.5)	5 (1.0)	15 (1.8)	0.034
Prevented from Getting Job	2 (0.3)	1 (0.4)	1 (0.3)	0.005	2 (0.2)	0 (0)	2 (0.2)	0.030
Health Indicators								
Health Insurance[a,b]	484 (86.7)	220 (86.3)	264 (86.6)	0.008	1338 (98.9)	513 (98.8)	825 (98.4)	0.004
≥7 Alcoholic Drinks/Week[a]	71 (12.7)	32 (12.5)	39 (12.8)	0.004	94 (6.9)	34 (6.6)	60 (7.2)	0.012
Cigarette Smoker	246 (43.9)	79 (31.0)	167 (54.8)	0.239**	495 (36.4)	133 (25.6)	362 (43.2)	0.177**
IV Drug Use[a]	3 (0.54)	0 (0)	3 (1.0)	0.067	5 (0.37)	2 (0.4)	3 (0.4)	0.002
Recreational Drug Use[a]	178 (31.2)	73 (28.6)	105 (34.4)	0.105**	342 (25.3)	101 (19.5)	241 (28.8)	0.105**
Hypertension[c]	279 (49.8)	98 (38.4)	181 (59.3)	0.208**	692 (51.0)	219 (42.2)	473 (56.4)	0.139**
Diabetes[d]	139 (24.8)	47 (18.4)	92 (30.2)	0.135*	324 (23.8)	86 (16.6)	238 (28.4)	0.135**
HIV Indicators								
HAART					1253 (92.3)	481 (92.7)	772 (92.1)	0.048
Missed Care Appointmentsa					168 (12.4)	46 (8.9)	122 (14.8)	0.085*
Medication Adherence ≥ 95%[a]					864 (79.1)	204 (80.3)	660 (78.8)	0.024
Viral Load ≤200 copies/ml					1129 (82.2)	451 (86.9)	678 (80.9)	0.078*

Note: *p≤.05, **p≤.01, ***p≤.1; Applies to the last six months[a.] Or Ryan ADAP or Ryan White[b]
Blood pressure ≥140/90 mmHg, self-report, or use of antihypertensive medication[c]
Fasting blood glucose≥126 mg/dl, hemoglobin A1C≥6.5%, self-report, or use of antidiabetic medication[d]

Employment was associated with improved quality of life ($p \leq .01$), global neurocognitive function ($p \leq .01$), and psychological health (i.e., less depressive symptomology, stress, anxiety) for both WLWH and WARH ($p \leq .01$). Employment was also associated with better overall health, with women who were employed being less likely to have an indicator of hypertension or diabetes and having less symptom burden related to fatigue and pain ($p \leq .01$). Further, women who were employed were more likely to report positive health behaviors, such as decreased cigarette and recreational drug use ($p \leq .01$). Among WLWH, women who reported employment were less likely to have missed an HIV-care appointment in the past six months ($p \leq .05$), and more likely to report HIV viral suppression (HIV RNA $\leq$ 200 copies/ml) ($p \leq .05$). Better socioeconomic status (i.e., education, housing, and income (($p \leq .1$),)) was also associated with employment across groups.

Table 3 presents the results of the hierarchical regression modeling analysis for employment among WLWH.

Table 3. Multivariable Regression Modeling of Employment among WLWH and WARH

	WARH			WLWH		
	Model1	Model 2	Model 3	Model1	Model 2	Model 3
	β	β	β	β	β	β
Global Neurocognitive Rating	-.114	-.028	-.032	-.055	.033	.023
Quality of Life[a]	.377*	.275*	.278*	.349*	.279*	.305*
Smoking Status	-.232	-.148*	-.162*	-.019	-.001	.001
HIV Viral Load ≤ 200	-	-	-	.031	.019	.022
Missed HIV Care	-	-	-	.023	.008	.012
Education		-.070	-.085		.180*	.180*
Household Income		.392*	.416*		.354*	.356*
Time Providing Childcare		-.056	-.073		-.111*	-.110*
Race[b]		.027	.012		-.016	-.010
Emotional/Informational			.096*			-.032
Tangible Support			-.210			-.056
Stress			-.023			-.052
Depression≥16			.018			.005
Internalized HIV Stigma						.075
Std. Error of the Estimate	0.427	.396	.394	.470	.417	.416
Adjusted R^2	0.259	.364	.371	.118	.306	.309
Model Significance	.000*	.000*	.000*	.000*	.000*	.000*

Note: Dependent Variable: Employment Status, *p<.05
[a]Quality of Life (.2*physical function (fx)+.17*pain + .28*fatigue +.2*emotional wellbeing + .05*social fx + .1*role fx)
[b]Race categorized as "white" and "other"

Model 1 included clinical factors previously associated with employment including HIV-viral load suppression, adherence to HIV-care appointments, neurocognitive function, quality of life, and cigarette use. The first model explained 11.8% of the variance of employment among WLWH ($p < .001$). In model 2, we added socioeconomic factors shown to be associated with employment, including race,

education, income, and number of hours providing childcare. Model 2 explained 30.6% of the variance of employment among WLWH ($p < .001$). Finally, in model 3, we added psychosocial factors shown to be associated with employment, including internalized HIV-stigma, depression, stress, and the availability of emotional/informational or tangible social support. The final model explained 30.9% ($p < .001$) of the variance of employment among WLWH. Household income ($\beta = .356$; $p < .05$), quality of life ($\beta = .305$; $p < .05$), education ($\beta = .180$; $p < .05$), time providing child care ($\beta = .110$; $p < .05$), and internalized HIV-stigma ($\beta = .075$; $p < .05$) demonstrated a significant relationship with employment, while controlling for global neurocognitive function, race, psychological health, and HIV-specific outcomes (i.e., viral load suppression, and adherence to HIV care appointments).

The same modeling was conducted for WARH, excluding HIV-specific measures (i.e., viral load suppression, adherence to HIV care appointments, and internalized HIV-stigma). Model 1 (the clinical model) explained 25.9% ($p < .001$) of the variance of employment among WARH. Model 2, which added socioeconomic context, explained 36.4% ($p < .001$) of the variance in employment among WARH. Our final model, which included psychosocial factors explained 37.1% ($p < .001$) of the variance of employment among WARH. Household income ($\beta = .416$; $p < .05$), quality of life ($\beta = .278$; $p < .05$), tangible social support ($\beta = -.210$; $p < .05$), cigarette use ($\beta = -.162$; $p < .05$), demonstrated a significant relationship with employment while controlling for global neurocognitive function, race, and psychological health characteristics.

Discussion

The purpose of this study was to examine the relationships between clinical, socioeconomic, and psychosocial contexts and employment among WLWH and WARH. We found that for both WLWH and WARH, employment was associated with favorable health outcomes (i.e., fewer comorbidities), socioeconomic indices (i.e., income and educational attainment), and psychosocial characteristics (i.e., social support, psychological wellbeing, and health behaviors). Furthermore, among WLWH, employment was associated with better adherence to HIV-care appointments, viral load suppression, and lower levels of internalized HIV-stigma.

Our models demonstrated the strongest associations for socioeconomic variables on employment. This corroborates the current body of research that HIV infection is a socioeconomic disease, and that socioeconomic disparities negatively influence health status, and the ability to access and maintain employment (Adimora et al., 2014; Collaborative on Health and the Environment, 2019; Pellowski et al., 2013). Furthermore, our work adds to the evidence that employment is beneficial to health, and that unemployment negatively impacts physical health, emotional wellbeing, and socioeconomic status (Degroote et al., 2014; Dray-Spira et al., 2008; Drydakis, 2015; Paul & Moser, 2009; Vance et al., 2015; Wagener et al., 2014). In addition, our work shows that as HIV-care management has improved, living with HIV had decreasing impact on employment as seen by the similarities in association between WLWH and WARH (Dray-Spira et al., 2008; Dray-Spira et al., 2012; Verbooy et al., 2018). Rather, the contexts associated with living with HIV (i.e. socioeconomic status, general physical health, and psychosocial health) appear to impact employment status among WLWH.

Thus, society must shift its focus away from the older school of thought that WLWH should not work as they are disabled, and encourage WLWH to re-engage (or enter) the workforce to achieve the many benefits of employment (i.e., health, wellbeing, self-determination, autonomy, empowerment) (Degroote et al., 2014; Foundation, 2013; Kordovski et al., 2017; Leonardi & Scaratti, 2018; Unanue et al., 2017; Vance et al., 2015; Vance et al., 2015; Wagener et al., 2015; Wagener et al., 2014). Based on the literature and the results of this study, employment does not interfere with the ability for WLWH to adhere to antiretroviral medication regimens necessary for viral suppression, attend scheduled HIV-care appointments, or add to the negative psychosocial effects of living with HIV (Hergenrather et al., 2016). Thus, there is little reason for WLWH to not seek employment. Rather, our results suggest that failure to encourage employment among WLWH may actually be depriving them of improved health and wellbeing. While our results are cross-sectional in nature, they corroborate the results of longitudinal studies in other populations, which suggest that employment and re-employment are predictive of improved physical health, psychological health, and quality of life; whereas unemployment is predictive of worse physical and psychological health (Hergenrather, Zeglin, McGuire-Kuletz, & Rhodes, 2015, 2015). Thus, collectively, these results suggest that it is imperative that we motivate WLWH to engage in the workforce and remove the barriers, which may prevent their re-entry.

One strategy in reducing occupational disparities among WLWH is to educate health care providers on the reasons why WLWH should re-engage with the workforce once their HIV-infection is well-managed. Notably, employment increases income thereby by providing the benefits from improved self-worth, self-care, health, and quality

of life (Hergenrather et al., 2016). These benefits not only improve individual quality of life, but are associated with improved familial, community, and economic outcomes contributing tremendous importance to society as a whole (Kaori Fujishiro, 2017; NIOSH, 2017). Providers must be aware of the unique barriers, which may hinder re-engagement with the workforce within this population, so that appropriate interventions can be initiated to mitigate barriers and improve employment for better health among WLWH. As an example, long-term disability enrollment and social isolation related to HIV-stigma may negatively impact the psychosocial and cognitive function among WLWH (Cacioppo & Hawkley, 2009; Hergenrather et al., 2016; Hergenrather et al., 2015; Isobel et al., 2018; Vance, Bail, Enah, Palmer, & Hoenig, 2016). Yet, psychosocial functioning (i.e., stress management, emotional coping, interpersonal navigation/communication), and cognitive function (i.e., planning, prioritizing, problem solving) are critical to both employment acquisition and maintenance; and impairments in these domains must be addressed to reduce occupational disparities among WLWH (Bielecky et al., 2015; Davis-Street et al., 2016; Johnson et al., 2005; Karlsson et al., 2010; Lazarus, 1984; Macsinga et al., 2015; McGurk et al., 2016; Vance et al., 2015; Varekamp et al., 2011; Wright et al., 2010). Understanding these barriers, health care providers (i.e., physicians, advance practice practitioners, nurses, social workers, case managers) are in a key position to take inventory of the occupational needs of WLWH, and refer them to comprehensive services that facilitate more positive outcomes (Gallant et al., 2011).

While vocational rehabilitation serves an important role in improving employment outcomes for WLWH, other interventions, such as cognitive training and

cognitive behavioral therapies have been shown to improve cognitive function, stress management, and psychological health (respectively) among WLWH (Hemmati Sabet, Khalatbari, Abbas Ghorbani, Haghighi, & Ahmadpanah, 2013; Hofmann & Gomez, 2017; Vance, Fazeli, et al., 2019). Moreover, the need for a more holistic conceptualization of vocational rehabilitation should be considered for WLWH, who may need assistance developing the skillsets associated with the management of interpersonal relationships (i.e., emotional and social intelligence, interpersonal communication, self-advocacy, boundary setting), as well as assistance developing a sense of personal empowerment (i.e., self-efficacy, self-worth), that is associated with employment (Annalena et al., 2015; Brody et al., 2014; Chang et al., 2015; Dale et al., 2014; Johnson et al., 2005; Karlsson et al., 2010; Kebriaei, 2016; Kennedy, 1995; Li et al., 2013; Macsinga et al., 2014; Mathisen & Bergh, 2016; Sverker et al., 2009; van Servellen et al., 2002; Wright et al., 2010). Additionally, although our data indicated that employment was associated with less internalized HIV-stigma, concerns over disclosure, stigmatization, and discrimination still serve as an important barrier to employment among WLWH (Miedema, Wagener, Roelofs, Gorp, & Opstal, 2017). Thus, these concerns must be recognized as a vocational need of WLWH who desire to engage with the workforce. Guidance about workplace HIV self-disclosure and methods to manage HIV stigma should be provided so as to empower WLWH to best navigate this critical barrier (Miedema et al., 2017; Wagener et al., 2015).

In addition to the aforementioned interventions, which seek to mitigate psychosocial barriers to employment and occupational productivity among WLWH, interventions to improve the overall benefit of employment among WLWH must also be

considered. Notably, the benefits of employment are moderated by the characteristics of employment. Jobs that provide greater autonomy, social cohesiveness, purpose, organizational support, and stability are associated with better health and occupational outcomes (Hergenrather et al., 2016; Rueda et al., 2012; Rueda et al., 2015). Yet, the ability to attain high quality employment is largely contingent on educational attainment, a context supported by the literature, and our study, to hinder positive occupational outcomes among WLWH (Collaborative on Health and the Environment, 2019; Pellowski et al., 2013). Therefore, interventions to improve educational attainment among WLWH must be implemented. While this may seem daunting due to the complexities of factors influencing the attainment of higher education (i.e., poverty, social class, conflicting responsibilities, and disparities in academic achievement), there are interventions which have demonstrated efficacy in improving access to higher education among lower socioeconomic populations, with implications for policy and practice (Sosu, Smith, Santoro, & McKendry, 2018). For example, outreach programs which increase knowledge of the application process, improve skillsets and attributes that improve applicant competitiveness (i.e., interpersonal skillsets and persuasive writing techniques), and link applicants to the financial planning resources necessary to fund college have demonstrated efficacy in improving college enrollment in individuals with lower socioeconomic status (Sosu, 2016; Wilson, Iyengar, Pang, Warner, & Luces, 2012). Programs which provide additional mentorship to facilitate more effective study strategies, stress management, and time management have demonstrated efficacy in improving graduation rates among disadvantaged students once they have enrolled (Wilson et al., 2012). While these interventions may not be best implemented by health

care providers, a knowledge of the local resources (such as outreach and mentorship programs),which are supported to improve educational attainment, and thus, quality employment outcomes among WLWH is needed to better link WLWH to these beneficial services. Moreover, healthcare providers are in a key position to collaborate with policy makers on the benefits of education on employment, and its implications for WLWH.

Although our work has many strengths, including the ability to distinguish the impact of HIV-infection from the socioeconomic and psychosocial contexts associated with living with HIV, we acknowledge several limitations. First, this study was cross-sectional in nature, making it difficult to infer causal relationships between socioeconomic, psychosocial, and health-related context, and employment among WLWH. Although this study's results corroborate with the findings of longitudinal studies in other populations, longitudinal studies examining the impact of employment among WLWH are needed to clearly identify causal pathways and refine interventions. Second, the women in this study were participants in the WIHS, which likely provides them with greater access to health and psychosocial resources compared to the general population. However, WIHS demographically represents WLWH and WARH in the U.S., which should reflect the distribution of socioeconomic and psychosocial resources among the general population. Finally, the relationships between the socioeconomic environment, employment, and personal outcomes (i.e., physical and psychological health) are complex and largely dependent upon personal traits we were unable to examine in the current analysis. Future research efforts should seek to examine personal traits (i.e., personality, emotional and social intelligence, personal empowerment,

hardiness, resilience, and locus of control), which may moderate employment outcomes among WLWH.

Conclusion

Employment is now considered a social determinant of health, influencing access to resources and social power, and predicting overall health and wellbeing. Although HIV-infection no longer prevents WLWH from working, substantial socioeconomic and psychosocial barriers exist which impact employment, and thus, deprive WLWH of the acquisition of its many benefits. To improve quality of life, health, and the social status of WLWH, future interventions and policy must recognize the holistic impact of socioeconomic, psychosocial, and health-related contexts influencing employment among WLWH, and take steps to improve access to quality employment options among this vulnerable population.

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A MIXED-METHODS STUDY UNDERSTANDING THE PSYCHOSOCIAL CONTEXT OF EMPLOYMENT AND OCCUPATIONAL PRODUCTIVITY AMONG WOMEN LIVING WITH HIV

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ABSTRACT

Women living with HIV (WLWH) are particularly vulnerable to poor employment outcomes, which impacts their socioeconomic independence and personal sense of empowerment. This article presents the results of a mixed methods study, which examined the personal, clinical, and socioeconomic contexts associated with employment and occupational productivity among employed WLWH (n = 164) in the Southern United States. The Stanford Presenteeism Scale-6 was used to assess the perceived impact of HIV disease on the ability to maintain focus and complete tasks at work. In this sample, 62% of women perceived no impact on their work related to living with HIV. Controlling for HIV viral load ≤ 200 copies/ml, missed HIV-care visits, and health-related quality of life; empowerment, neurocognition, socioeconomic status, and psychological health were significantly associated with occupational productivity. In-depth interviews (n = 29) provided rich contexts and meaning surrounding employment among WLWH. Psychosocial and structural interventions are needed to improve occupational outcomes in this vulnerable population.

Keywords: Employment, Women living with HIV, Occupational Productivity, Mixed-methods study

Employment impacts our livelihood, financial stability, human capital, social connectedness, and overall health and wellbeing (Degroote et al., 2014; Foundation, 2013; Vance et al., 2015; Wagener et al., 2014; Worthington, O'Brien, Zack, McKee, & Oliver, 2012). It feeds our basic human need for self-determination and enhances overall quality of life (Degroote et al., 2014; Leonardi & Scaratti, 2018; Unanue et al., 2017; Vance et al., 2015; Wagener et al., 2014). Although employment is beneficial for the general population, it may hold particular benefit for people living with HIV as it may improve HIV-specific clinical outcomes (i.e., CD4 count, viral load, medication adherence), and help counter the cumulative disadvantage associated with living with HIV (Foitzek et al., 2018; Gómez et al., 2016; Nachega et al., 2015; Pellowski, Kalichman, Matthews, & Adler, 2013). Yet, in spite of the evidence that most PLWH are now able to work, an estimated 60% of PLWH do not work. Women living with HIV (WLWH), in particular, are less likely to be hired and more likely to lose their jobs compared to men living with HIV (Dale et al., 2014; Dray-Spira et al., 2008).

The evidence suggests that perceived impairments in occupational productivity negatively influence hiring decisions in people living with chronic disease, such as HIV disease (Leonardi & Scaratti, 2018; Louvet, 2007). Further, gender-based differences (i.e., personality, emotional coping, perceived self-efficacy, social support, and cognition) are reported to influence productivity and job maintenance among women (Bielecky et al., 2015; Bokma et al., 2017; Brody et al., 2014; Dray-Spira et al., 2008; Gosselin et al., 2013; Karlsson et al., 2010; Macsinga et al., 2015; McGregor et al., 2014; Unanue et al., 2017; van Scheppingen et al., 2013; van Servellen et al., 2002; Varekamp et al., 2011). Yet, little is known about the contexts influencing employment, and the experience of

employment for WLWH. To inform future policy decisions and interventions aimed to alleviate occupational disparities in this population, we must first understand barriers and facilitators influencing the experience of employment and occupational productivity among WLWH.

While productivity loss can occur through absenteeism or presenteeism, people living with chronic disease have increased odds for presenteeism, or decreased productivity while at work related to impairments in their physical and psychological health, and symptom burden related to their underlying disease process (Garrow, 2016; Gosselin et al., 2013; Koopman et al., 2002). Due to the chronic nature of their health impairment, they must attend work while ill, versus being able to take an absence for a short-term, curable condition. For example, people living with diabetes often attend work while experiencing glycemic imbalance and neuropathies, which impact their ability to complete tasks at work and stay in tune with the cognitive demands of employment(Mori et al., 2019). Co-morbid depression, common to many people living with chronic disease, may further impair production at work through its associations with fatigue, cognitive dysfunction, and decreased motivation (Bielecky et al., 2015; Mori et al., 2019). Yet, many people living with chronic disease work, at a suboptimal level of performance for themselves, because they desire to retain employment. For PLWH, this may mean attending work while experiencing neurocognitive impairments, fatigue, and depression; potentially impacting their ability to complete work accurately, safely, and efficiently(Verbooy et al., 2018). The evidence suggests that personal and social contexts influence productivity at work, in addition to health (Garrow, 2016; Gosselin et al., 2013;

Hafner, 2012; Okechukwu et al., 2014). Yet, the full contexts influencing occupational productivity and employment in WLWH are largely undocumented. Therefore, the purpose of this study was to explore the lived experience of employment and to comprehensively examine the factors associated with occupational productivity among employed WLWH in the Southern United States (U.S.). We chose the Southern U.S. as it is currently the epicenter of the HIV-epidemic in the U.S., which continues to have a unique cultural context (i.e., racial discrimination, gender roles, HIV-stigmatization) that impacts employment among WLWH (Prevention, 2016; Southern AIDS Coalition).

Methods

This study was conducted as an ancillary study to the Women's Interagency HIV Study (WIHS). WIHS was established by the National Institutes of Health in 1993 to study the overall impact and progression of HIV infection among women in the U.S., and to date has enrolled nearly 5,000 women who are living with (n = 3,677) or at risk for acquiring HIV (n = 1,305)(Adimora et al., 2018). Four sites in the Southern U.S. (Birmingham, AL, Jackson, MS, Atlanta, GA, and Chapel Hill, NC) were selected to collect qualitative and quantitative data. Although eligibility criteria for enrollment has changed throughout the four recruitment waves of the study, the most current wave (2013-2015) recruited WLWH who were 25-60 years old at enrollment, and reported the use of highly active antiretroviral therapy (HAART) without prior use of sub-therapeutic anti-retroviral therapy (ART), except as indicated for pregnancy or as pre- or post-prophylaxis treatment (Adimora et al., 2018). Women enrolled in WIHS attended study visits every six months for clinical, behavioral, and psychosocial assessments, and

additional neurocognitive testing at rotating, two year-intervals (Adimora et al., 2018). Qualitative interviews were conducted following quantitative data collection in a subset of women who completed questionnaires at a previous WIHS visit. Although data collection was not concurrent, data analysis was completed concurrently due to several factors (i.e., data cleaning duration, IRB approval, and qualitative recruitment).

Collection of Qualitative Data

Employed WLWH (≤64 years of age) (n = 164), who attended WIHS study visits between April and October 2018 (i.e. study visit 48), were eligible to participate in qualitative interviews. The purpose of the interviews was to gain insight into the lived experience and contexts impacting employment among WLWH. Between 7 - 8 women were recruited from each of the four sites, with purposeful variance in the woman's socioeconomic background and familial responsibilities. Women agreeing to participate in in-depth interviews (n = 29) were consented in person, or over the phone, in compliance with the site's governing Institutional Review Board (IRB). After informed consent was obtained, a demographic questionnaire was administered to assess age, education, job type, duration of employment, and familial responsibility. Semi-focused interviews designed to elicit the significance, lived experience, and comprehensive contexts of employment among WLWH were conducted by phone, recorded, and transcribed verbatim by a professional transcription service. Table 1 provides an overview of questions used during the interviews.

Table 1. Qualitative Interview Script

Item	Question
1	• I'm going to ask you questions related to how your life affects your job and what your job means to you. First, let's start with the basics. What does work mean to you personally? I'd like you to describe how work adds to your value or worth as a person, or is it more of a means to an end for you?
2	• What do you do for work? What kind of tasks do you do on a daily basis? What kind of hours do you work?
3	• Tell me how you made the decision to accept your current job. What about the job was most appealing to you?
4	• Since you've been working, what are your reasons for staying with the job? What kind of benefits does working provide you outside of money?
5	• Can you describe some of the work-related challenges you face? What techniques or strategies have you used to handle them?
6	• Do you have reliable transportation? What kind? If no, how do you manage getting to and from your job? How does that affect your ability to work?
7	• Tell me about what you've had to give up personally in order to work. How do you balance work with other important things in your life? I'd like you to describe your current work-life balance.
8	• What are your responsibilities to take care of outside of work? Can you tell me how you manage those responsibilities? Can you tell me about a situation where you couldn't manage your real-life responsibilities because of your work? What did you do?
9	• How has living with HIV affected your work? Has working affected your medications? Has working affected your doctor's appointments? How have you managed?
10	• Please describe how your family or friends support or hinder your ability to work. What have you done to help find support or how have you handled friends and family if they have hindered you working? Tell me about that.
11	• I'd like you to describe any accommodations your work provides to help make life easier for you? For example, do they allow for flexible scheduling or shifts, or are they flexible with your doctor's appointments and other important things that come up in life? Tell me about a time you had to speak up for yourself or use certain strategies to get work to accommodate your needs. Do you feel like you can speak up at work? Tell me more about that.
12	• Please describe any arrangements that help balance your work and personal lives. This includes things like childcare, support from family and friends, doctor visits, and time for you.
13	• Overall, do you feel like you have more control or less control over your life because of your job? I'd like you to tell me about at least one example when you felt this way.

Collection of Quantitative Data

WLWH who were employed (n = 171) during study visit 48 were eligible for the quantitative data collection of the study. Variables of interest collected during the WIHS core visit included socioeconomic, personal, and health-related data. Occupational productivity was assessed through the Stanford Presenteeism Scale, which assesses the impact of health problems on the ability to complete tasks, as well as the ability to avoid distraction and stay focused during work (Koopman et al., 2002). The scale was adapted to PLWH by replacing "health problem" with "HIV-infection". Employed WLWH who attended visit 48 and did not complete the occupational productivity assessment were excluded from analysis.

Socioeconomic variables. Age, race, marital status, household income, child-care responsibility, educational attainment, housing stability, and access to medical insurance were assessed during biannual core WIHS visits. Serious physical abuse was assessed by asking "Since your last visit, have you experienced serious physical violence (physical harm by another person)?".

***Psychosocial variables*.** Internalized HIV-stigma, symptoms of stress, symptoms of depression, anxiety, perceived adequacy of emotional/informational and tangible social support, and personal empowerment were assessed using the HIV-Stigma Scale (Berger, 2001), Perceived Stress Scale (Cohen et al., 1983), Center for Epidemiological Studies-Depression Scale (Radloff, 1977), Generalized Anxiety Scale-7 (Spitzer et al., 2006), MOS Social Support Survey (Sherbourne & Stewart, 1991), and the Personal

Progress Scale-Revised (Johnson et al., 2005). Cognitive health was assessed using a series of instruments, including the Hopkins Verbal Learning Test-Revised, Trail Making Test Part B, Stroop Test, Symbol Digit Modalities Test, Grooved Pegboard testing, and semantic and fluency testing. Global scores were created using demographically adjusted scored from each domain (learning, memory, attention, executive function, psychomotor accuracy and speed, and verbal function) (Rubin et al., 2017). Health-related quality of life (QOL) was assessed though the MOS-HIV scale (Wu et al., 1997), summarized through Bozette's QOL index (.20*physical function + .17*pain +.28*fatigue + .20*emotional wellbeing + .05*social function + .10*role function) (Bozzette, Hays, Berry, Kanouse, & Wu, 1995).

***Clinical Variables*.** The presence of hypertension, diabetes, anemia, and obesity were assessed via clinical assessments and self-report. Indicators of hypertension included a current blood pressure reading greater than 140/90 mmHg, self-report, or the use of antihypertensive medications. Likewise, indicators of diabetes included a fasting blood glucose level ≥ 126 mg/dl, hemoglobin A1C value ≥ 6.5%, self-report, or the use of anti-diabetic medications. Anemia was monitored through the clinical evaluation of hemoglobin and hematocrit levels, and obesity was assessed via body mass index (kg/m^2). Negative health behaviors (i.e., excessive alcohol use, drug use, and tobacco use) were evaluated through self-report. HIV-specific outcome measures (i.e., missed appointments during the last six months, HIV-viral load ≤ 200 copies/ml, and CD4 count/mm^3) were assessed via self-report or blood draw.

Qualitative Data Analysis

In order to best address the lived experience and contexts influencing employment for this population, a hermeneutic phenomenological approach was used (Wojnar & Swanson, 2007). Two coders (J.W. and C.O.) worked independently and collaboratively to extrapolate themes using a stepwise, iterative process until both coders were in full agreement and data were coded in a manner that accurately portrayed the experience and meaning of employment as described by participants. Memoing and journaling were used to document coding decisions and enhance interpretation.

Quantitative Data Analysis

SPSS v.24 was used to compute descriptive statistics, simple linear regression, and correlations to examine the relationships between variables of interest, and occupational productivity. Occupational productivity scores were categorized into "impaired" and "no impairment". Specifically, scores of 30 were recoded to "no impairment" with all other scores (12 - 29) coded as "impaired". Hierarchical regression modeling was used to better elucidate the interactive effect of socioeconomic, personal, and health-related characteristics, with a priori established variables of interest and occupational productivity as the outcome.

Data Triangulation

Quantitative and qualitative data were analyzed concurrently, with findngs integrated after the intitial interpretation of each data set. Because our qualitative data collection on understanding the lived experience of employment for WLWH was not

solely focused on occupational productivity (our quantitative outcome of interest), we could not assess for convergence and divergence directly. However, qualitative and quantitative data were considered for complementarity in order to give a more holistic picture of the factors impacting employment and occupational productivity among WLWH.

Ethical Statement

This study was approved by the University of Alabama at Birmingham's IRB, as well as the IRB at each collaborating site.

Results

Qualitative Findings

We conducted qualitative interviews with employed WLWH (n = 29) to better understand the meaning and experience of employment among WLWH. Most participants were black (n = 27, 93%) and not married or living with a partner (n = 16, 55%), with approximately 1/3 reporting responsibility for a child under 19 years of age (n = 8) or another adult (n = 3). The majority of women (n = 18, 62%) had attended college, with 35% (n = 10) having earned an associate degree or higher. Very few (n = 3, 10%) reported sub-optimal transportation (i.e., reliance on public transportation or taxi services). Job types varied, and women reported employment in the service industry (i.e., food service, catering, cleaning) (n = 15, 52 %), as unlicensed health care employees (n = 9, 31 %), in professional roles (n = 3, 10 %) such as teaching, counseling, and licensed health care employees ,and as administrators (n = 2, 7%). Most women (n = 17, 59%)

reported being in their current position for more than one year, and 52% (n = 15) reported receiving academic and/or technical training for their current job. Furthermore, the majority of women (n = 24, 83%) reported that their employers provided some sort of flexible scheduling to accommodate health-management needs and other personal requests. Although participants were not directly asked about healthcare benefits, 17% (n = 5), reported that their employer provided health insurance which was considered an important benefit associated with their job. Five themes emerged that captured the significance, experience, and contexts impacting employment among WLWH: 1) Quality of Life, 2) Work-Life Balance; 3) Empowerment, 4) Social Support, and 5) Psychological Health.

Quality of life. Most women reported that work improved their quality of life, both through traditional benefits (i.e., income and health insurance), and through increased satisfaction, depth, and confidence in life. Work served as an outlet from the more mundane aspects of life as well as a distraction from life's stressors. For many women, work provided a sense of purpose, and created a positive sense of responsibility and identity. One participant described how work improved her quality of life-

> *It gives me a focus. It gives me something to look forward to. It gives me a sense of giving outside of myself, of being able to help people….It adds a lot of value to my life.*

Although most women viewed employment in a positive light, some women described that it negatively impacted their life and self-determination. One woman described how she works because she has to-

> *It's less. It's less [control]. That's why I say, I'm just really getting tired of working, but I know, I got to work.*

Work-life balance (including health care). Women described that their quality of life hinged, in part, on the ability to achieve work-life balance. Although most women reported that some sort of personal sacrifice was necessary to work (i.e., losing time with family, self, or delaying other goals), very few (n = 3) reported poor work-life balance. For many women, their routines, skill sets, and attributes facilitated their ability to achieve work-life balance. For example, women with greater work-life balance had established what their personal priorities were, and structured their lives accordingly to accommodate self-care, recreation, relationships with other people, and dedicated time for causes which were deemed important. One woman described how she achieves balance in her life-

> *I feel like I have control over it, because I'm not gonna bite off more than I can chew. I feel like I'm pretty much balancing it. It's taken a long time over the years to learn how to….I had to just learn how to manage and balance so then I can still get in work and play.*

When asked about non-work responsibilities, women reported familial duties, such as household upkeep and caregiving, but also emphasized the importance of self-care. For example, most women prioritized their own health maintenance, recognizing the critical role health care played in maintaining quality in both their personal and work lives. Although many women chose not to disclose their status at work, most did not perceive that work interfered with their ability to adhere to HIV-medications or keep doctor's appointments. Most (83%) felt that their employers provided reasonable flexibility in scheduling, which allowed them to attend to their own care, as well as other personal matters of importance.

Although few women reported poor-work life balance, those that did described excessive stress from managing conflicting role and time expectations. One woman described her frustrations as follows-

> *There have been times where I [could] not complete my tasks as a wife, and as a mother, at home 'cause I was busy tryin' to rush to work, or I'm gettin' off late….I get real frustrated because I know…what my family's expecting, and sometimes I can't do that.*

Empowerment. Women described that the ability to set and enforce personal boundaries, and advocate for themselves in times of need greatly influenced the experience of employment, as well as their overall work-life balance. Although their

personal skillsets played a large role in personal empowerment and the ability to navigate difficult situations, which arose as part of work, or even in conflicts with work, women described that the work environment itself significantly influenced their ability to effectively exercise these skill sets. Many women described working environments characterized by an essence of respect, active listening, and appreciation, allowing them to engage in difficult conversations and addressing their needs when accommodations were in order. However, women who described fear-driven working environments were less likely to address confrontational situations for fear of repercussion. As one woman explained-

> *You have to be careful sometimes, careful just takin' somethin' to another level. Then this person and these other people are confronted, and then you got to deal with their attitudes after that or how they may still treat you. They may treat you even worse or whatever the case may be. [The higher authorities] act concerned…but they don't see it. They don't. I suck it up. I deal with it.*

Social Support. Women reported that social support, both within and outside of the work environment, influenced the experience of employment. Some women described that their social support systems influenced employment indirectly by encouraging positivity and resiliency, impacting motivation to work and their ability to handle stressors. Other women described how functional support, such as being part of a team or

having additional logistical problem-solving support, facilitated less role-strain and better overall experience at work-

> *It [takes a lot to get things done sometimes.] It really does. At one point, I was tryin' to do it by myself and I was real angry, but everybody kicked in. I thought about it, I said wait a minute, just allow them to do it, ask 'em, can you do this, can you do that? Give them the opportunity to step in and help you and that's what I had to do….*

However, some women described how an inadequate support system negatively impacted employment in her home town.

> *It's so hard for me to get a job…especially in my town, because …it's like I'm stereotyped because I have been an addict and I have been in jail…. It's like I'm blackballed or something, you know? I know these people need work and I'm applying myself to get this work, but when it's time for the hiring, I'm always looked over.*

Social support from within the organization also influenced work experiences. Some women described how work environments that promoted self-care influenced the experience of work-

It's not just a slave-driven work, work, work, work, work. They actually do put family values first.

Whereas, another women explained how the lack of cohesion at work negatively impacted her experience -

Nobody's together. It's like nobody's in sync with each other. It's a dog eat dog world, so nobody's looking out for you.

Psychological health. Many women described how work improved their psychological health by providing a means for self-determination and greater autonomy. Some women described that the income generated by working allowed them to be financially independent, while other focused on the ability to be able to take care of their loved ones. One woman described the feeling associated with not having to ask for handouts anymore-

It means a lot to me because I've been out of work for so long….It makes me feel complete so to speak, self-sufficient…I'm standing much straighter. I think that I feel like I don't have to ask for as many handouts anymore, you know?

Just as work influenced psychological health, psychological health influenced work. Some women described that their ability to view challenges as a blessing influenced resiliency, their ability to handle stress at work, and their determination to move forward-

I do not get stressed out [laughing] because at the end of the day, all I know is I've done my best for that day and we'll start a new day and try again.

Other women described how negative coping mechanisms, like avoidance, added to stress and strain from work-

Like I said, I just tolerate some things.

Women also discussed how the work environment influenced their psychological health. Women, who described environments that facilitated empowerment and autonomy in the workplace, which provided an opportunity for meaningful work, were able to derive greater satisfaction out of work. Some women described greater personal development from work, the ability to build new skillsets they were proud of, and a sense of identity and purpose from being able to contribute to something larger than themselves. However, work environments that made women feel unproductive, unappreciated, and not listened to, undermined the ability for work to add personal value. One woman described her decision to stay with her job because they listened-

They do-they listen to your voice, your concerns and stuff like that, and they take it into consideration, and see what it is that they can do to accommodate you and make it a whole lot better for you….

Quantitative Results

To add additional insight into the contexts impacting employment among WLWH, quantitative data were collected to examine the relationships between socioeconomic, psychosocial, and clinical variables of interest and occupational productivity among employed WLWH. In total, 164 women across four study sites completed the occupational productivity assessment, with only seven employed WLWH electing to not complete the survey and being excluded from analysis. These numbers account for a 38% employment rate across participating WIHS sites. Participation numbers varied across sites, related to the total number of women followed at each site, and differences in employment rates by region. Employed women participating at the Atlanta site represented 35.4% of participants, followed by Chapel Hill (34.1%), Jackson (19.5%), and Birmingham (11.0%). Tables 2 and 3 present the demographic, socioeconomic and health characteristics of our sample.

Table 2. Continuous Variables and Correlations with Occupational Productivity

	Employed WLWH	Perceived Impairment in Occupational Productivity among Employed WLWH			
	TOTAL = 164	*NO* = 102	*YES* = 62		
MOS-HIV Scale [a](See Footnote)		**Mean (SD)**	**Mean (SD)**	**Adjusted R2**	**p**
Physical Function	84.2 (22.5)	86.4 (21.9)	80.6 (23.2)	0.009	0.114
Social Function	88.9 (20.5)	91.8 (18.7)	84.2 (22.6)	0.026	<.05*
Pain	81 (20.1)	82.2 (20.2)	79.1 (20.1)	0	0.343
Emotional Wellbeing	78.8 (22.9)	82.4 (22.7)	72.8 (22.1)	0.036	<.05*
Role Function	92.9 (16.8)	93.3 (16.9)	92.3 (16.7)	0	0.719
Energy/Fatigue	67.1 (25.6)	70.7 (26.3)	61.1 (23.5)	0.027	<.05*
Quality of Life	78.9 (17)	81.5 (16.7)	74.7 (16.8)	0.031	<.05*
Neurocognitive Rating[b]					
Executive Domain	2.5 (1.4)	2.3 (1.2)	3.1 (1.6)	0.051	<.05*
Speed Domain	2.3 (1.3)	2.1 (1.1)	2.6 (1.5)	0.035	<.05*
Attention Domain	2.8 (1.6)	2.7 (1.6)	3.1 (1.7)	0.009	0.137
Learning Domain	3 (1.9)	2.8 (1.9)	3.4 (1.8)	0.018	0.052
Memory Domain	3.1 (1.9)	2.9 (1.8)	3.5 (2.2)	0.026	<.05*
Motor Domain	2.1 (1.3)	2 (1.3)	2.3 (1.3)	0.014	0.076
Verbal Domain	2.7 (1.6)	2.7 (1.5)	2.7 (1.6)	0	0.523
Global Rating	3.4 (1.7)	3.2 (1.7)	3.9 (1.7)	0.035	<.05*
Social Support[c]					
Emotional/Tangible Support	4.1 (1)	4.2 (1.1)	3.9 (1)	0.008	0.126
Functional Social Support	4.1 (1.1)	4.3 (1)	3.8 (1.2)	0.053	<.05*
Psychological Health					
Depressive Symptoms[d]	9.3 (10.7)	7.7 (10)	4.7 (5.3)	0.033	<.05*
Anxiety (GAD-7)[e]	3.8 (5)	3.3 (4.7)	10.7 (6.9)	0.013	0.081
Perceived Stress[f]	8.4 (6.8)	7 (6.4)	5.5 (0.9)	0.064	<.05*
Empowerment[g]	5.9 (0.8)	6.2 (0.6)	5.5 (0.9)	0.156	<.001*
Internalized HIV-Stigma[h]	1.8 (0.7)	1.7 (0.6)	2.0 (0.8)	0.061	<.05*
Health Indicators					
Age	44.8 (8.6)	44.9 (9)	44.6 (8.1)	0	0.818
Hemoglobin (gm/dl)	12.5 (1.2)	12.8 (1.1)	12.2 (1.3)	0.053	<.05*
Hematocrit (%)	38.2 (3.4)	38.9 (3)	37 (3.7)	0.067	<.05*
Hemoglobin A1C (%)	5.7 (1.3)	5.7 (1.1)	5.8 (1.6)	0	0.549
Body Mass Index (kg/meter2)	35.2 (9.3)	35.2 (9.5)	35.3 (9)	0	0.95
CD4 count (cells/mm3)	753.5 (349.5)	799.2 (369.6)	679.4 (302.7)	0.022	<.05*

Note: MOS-HIV Scale Range is from 0-100, with 100 being best[a].
Neurocognitive ratings greater than 5 indicate impairment[b].
Social support range is from 1-5, with 5 being best[c].
Depressive symptoms: score ≥16 indicates depression[d]. Anxiety symptoms: score ≥10 indicates anxiety[e].
Perceived Stress range is 0-40, with 0 being best[f]. Empowerment range is 1-7, with 7 being best[g].
Internalized HIV Stigma range is 1-4, with 1 being best[h].

Table 3. Categorical Variables and Correlations with Occupational Productivity

	Employed WLWH	Perceived Impairment in Occupational Productivity in Employed WLWH			
	N =164	*YES* = 62	*NO* = 102		
Race		**N (%)**	**N (%)**	**Cramer's V**	**p**
White	13 (7.9)	4 (6.5)	9 (8.8)	0.066	0.868
Hispanic	4 (2.4)	1 (1.6)	3 (2.9)		
Black/African American	145 (88.4)	56 (90.3)	89 (87.3)		
Other	2 (1.2)	1 (1.6)	1 (1.0)		
Highest Education Level					
7th - 11th Grade	37 (22.6)	18 (29.0)	19 (18.6)	0.187	0.057*
High School	44 (26.8)	20 (32.3)	24 (23.5)		
Attended or Graduated College	83 (50.6)	24 (38.7)	59 (57.8)		
Residence					
House/Apartment	160 (96.7)	60 (96.8)	100 (98)	0.166	0.105
≤1 month Duration at Residence	4 (2.4)	3 (5.0)	1 (1.0)	0.134	0.237
Household Income					
≤ 12,000	39 (23.8)	20 (32.3)	19 (18.6)	0.185	0.252
12,001-24,000	58 (35.4)	20 (32.3)	38 (37.3)		
24,001-36,000	31 (18.9)	13 (21)	18 (17.6)		
36,001-75,000	27 (16.5)	8 (12.9)	19 (18.6)		
≥75,000	2 (1.2)	0 (0)	2 (2.0)		
Familial Responsibility					
Married or Living with Partner	44 (26.8)	16 (25.8)	28 (27.5)	0.029	0.719
Provides Care for own Child	46 (28.0)	20 (32.3)	26 (25.5)	0.109	0.39
Provides Care for Someone Else's Child	16 (9.8)	5 (8.1)	11 (10.8)		
Health Indicators					
Health insurance, ADAP, or Ryan White	159 (97.0)	60 (96.8)	99 (97.1)	0.008	0.918
Indication of Hypertension	81 (49.4)	29 (46.8)	52 (51.0)	0.041	0.601
Indication of Diabetes	25 (15.2)	11 (17.7)	14 (13.7)	0.054	0.488
Cigarette Use	56 (34.1)	23 (37.1)	33 (32.4)	0.049	0.534
≥7 Alcoholic Drinks/Week**	11 (6.7)	7 (11.3)	4 (3.9)	0.143	0.067*
IV Drug Use**	1 (0.6)	1 (1.6)	0 (0)	0.102	.195
Other Recreational Drug Use**	42 (25.6)	16 (25.8)	26 (25.5)	0.008	0.917
Serious Physical Abuse**	1 (0.6)	1 (1.6)	0 (0)	0.1	.200
HIV Medication Adherence ≥ 95% **	137 (83.5)	48 (77.4)	89 (87.3)	0.155	.080*
Viral Load Suppression (≤ 200/copies/ml)	134 (81.7)	46 (74.2)	88 (86.3)	0.152	0.052*
Missed HIV Care Appointments **	13 (7.9)	8 (12.9)	5 (4.9)	0.14	0.069*

* *p* <.1
***Last six months*

Women, on average, were 44.8 years of age, unmarried (69.1%), and educated. Most (77.8%) had received at least a high school education and 50.6% reported attending

college. Although most women were not responsible for a child under the age of 19 years (58.5%), those that reported caring for a child provided care for an average of 1.9 children over 11.5 hours per week. Women worked an average of 36.6 hours per week, and most (62%) indicated that their HIV-infection had little impact on their ability to complete tasks and stay focused at work.

Possible score ranges for occupational productivity were 6-30, with higher scores indicating better productivity at work. The mean score was 27.9 (+/- 3.7), and over half (62.3%) of women completing this measure scored 30, indicating no perceived impairment. Using simple regression analysis, differences were found in personal, health-related, and socioeconomic variables associated with productivity among WLWH (Tables 2 and 3). Greater neurocognitive function was associated with better productivity (R^2 = .035), with executive function (R^2 = .051), speed (R^2 = .035), and memory (R^2 = .026) demonstrating greater associations with productivity compared to other domains (i.e., attention, learning, motor and verbal). Better psychological health (lower depression symptoms (R^2 = .033), stress (R^2 = .064), and internalized HIV-stigma (R^2 = .061); and higher empowerment (R^2 = .156) were associated with better occupational productivity. Functional social support, but not emotional/informational support, was correlated with occupational productivity (R^2 = .053). WLWH who had higher educational attainment reported better productivity at work (R^2 = .187). HIV-specific health contexts, such as HIV-RNA viral load ≤200 copies/ml (Cramer's V = .152), higher CD4 count (R^2 = .022), and better adherence to HIV-care (R^2 = .143) were all associated with improved ocupational productivity. Table 4 presents the detailed results of hierarchical regression modeling.

Table 4. Regression Models of Perceived Occupational Productivity among WLWH

Model	B	Std. Error	Beta	p	Adjusted R^2	Std.Error of the Estimate
Model 1						
(Constant)	19.178	2.239		.000	.182	3.35273
Quality of Life*	.063	.016	.297	.000		
Viral Load Suppression	.165	.782	.017	.833		
Global Neurocognitive Rating	-.464	.164	-.215	.005		
HIV-Care visit Adherence	2.737	1.101	.203	.014		
Model 2						
(Constant)	16.007	2.842		.000	.224	3.26573
Quality of Life*	.052	.017	.247	.003		
Viral Load Suppression	-.207	.790	-.022	.793		
Global Neurocognitive Rating	-.434	.163	-.201	.009		
HIV-Care Adherence	2.995	1.077	.223	.006		
Education	.640	.349	.140	.069		
Functional Social Support	.418	.282	.123	.140		
Housing Stability	-.679	.355	-.142	.058		
Model 3						
(Constant)	13.129	3.500		.000	.388	2.89994
Quality of Life*	.011	.019	.050	.579		
Viral Load Suppression	-.451	.743	-.047	.545		
Global Neurocognitive Rating	-.371	.148	-.172	.014		
HIV-Care Visit Adherence	1.615	.988	.120	.105		
Education	.562	.312	.123	.074		
Functional Social Support	-.154	.267	-.045	.564		
Housing Stability	-.704	.317	-.148	.028		
Perceived Stress	-.041	.050	-.075	.416		
Personal Empowerment	2.037	.389	.441	.000		
Depression ≥ 16	-.950	.832	-.104	.256		

Note: *Quality of Life = (.2*physical function (fx)+.17*pain + .28*fatigue +.2*emotional wellbeing + .05*social fx + .1*role fx)(Bozzette et al., 1995)

Model 1 included clinical variables that were reflective of the overall management and impact of living with HIV; and therefore viral load suppression,

adherence to HIV-care appointments, quality of life, and global neurocognitive function were added to the model. The first model, explained 18.2% ($p < .001$) of the variance in occupational productivity. In Model 2 we added socioeconomic variables that have been previously associated with employment, including housing stability, education, and functional social support. When adding socioeconomic variables to the health model, 22.4% ($p < .001$) of the variance in occupational productivity was explained. Finally, in Model 3 we added personal characteristics reported to be associated with productivity in WLWH, including depressive symptoms, stress, and empowerment. The final, cumulative model explained 38.8% ($p < .001$) of the variance in occupational productivity. Personal empowerment ($\beta = .441$), global neurocognitive function ($\beta = -.172$), housing stability ($\beta = -.148$), education ($\beta = .123$), depressive symptoms ($\beta = .104$), and stress ($\beta = -.075$) demonstrated a significant impact on occupational productivity, controlling for quality of life, viral suppression, and adherence to HIV care.

Triangulation of Results

Triangulation of qualitative and quantitative results indicate that for employed WLWH, HIV had little impact on their ability to work or capacity to be productive. However, other determinants of health, including emotional coping and problem-solving skills, appear to impact both employment and productivity. For example, women who manifested skillsets associated with better neurocognitive function were more satisfied with work, experienced less role-strain from competing work and personal demands, and were more productive. Likewise, women with less depressive and stress symptomology, and those who utilized positive psychological techniques for coping were more likely to

be productive and have a positive experience with employment compared to those with poor stress management or negative coping techniques. Empowerment also emerged as a complementary finding between qualitative and quantitative findings. For example, our qualitative participants described that the ability to set and enforce boundaries, professionally address conflict, and advocate for themselves in times of need enhanced the experience of employment and the ability to fulfill their work-related obligations satisfactorily. Similarly, our quantitative data supported that women with greater personal empowerment had better productivity at work. However, social support appeared as a potential area of divergence in our study. While women participating in qualitative interviews emphasized the positive influence of emotional and functional support on emotional coping, problem-solving capacity, and the overall ability to work, our quantitative results indicate little impact of emotional social support on occupational productivity.

Discussion

The purpose of this study was to gain insights into the experience of employment, and psychosocial contexts impacting employment and occupational productivity among WLWH. Overall, we found that employment was a positive experience for WLWH and facilitated financial autonomy, provided a sense of purpose, and increased quality of life. Whether employment was a positive or negative experience was impacted by the amount of control women perceived they had over both their home and work environments; and perceived control seemed to be associated with women's characteristics, including their perceived quality of life and work-life balance, and ability to utilize positive

psychological, problem solving, and boundary setting techniques to strategically navigate through challenging situations. The women in our study perceived little impact of living with HIV on either their experience of employment or their productivity at work. However, women emphasized the importance of health prioritization in qualitative interviews and most women (81.7%) participating in the quantitative phase of our study were virally suppressed. Perceptions of their productivity were influenced by their socioeconomic status (i.e., housing, education, social networks), neurocognitive function (i.e., executive function, speed, memory), psychological health, and perceived level of personal empowerment.

Our findings are consistent with the literature that socioeconomic status influences employment and job maintenance (Braveman & Gottlieb, 2014; Pellowski et al., 2013). While this may occur through a variety of paths, socioeconomic status impacts our physical health (i.e., access to quality housing and nutritious food), human capital (i.e., attitudes, knowledge, and skillsets), and psychosocial resources (i.e. social support, emotional intelligence, and cognitive function) associated with employment (Braveman & Gottlieb, 2014; Darin-Mattsson, Fors, & Kareholt, 2017). For example, women of lower socioeconomic status may have reduced access to the bare necessities for adequate physical health, and may have difficulty accessing the psychosocial resources (i.e., positive coping and effective problem solving skills, influential social networks) that facilitate positive employment outcomes (Breet et al., 2014; Dale et al., 2014; Degroote et al., 2014; Grodensky et al., 2015; Hafner, 2012; Hutson et al., 2018; Liu et al., 2012; Pellowski et al., 2013; van Scheppingen et al., 2015; Wright, Perez, & Johnson, 2010; Wright et al., 2010). Moreover, women without access to higher education may limit

their employment options to those with less gratification, control, and autonomy, impacting motivation and overall productivity at work.

Our findings also support the evidence that the contexts and behaviors associated with better neurocognitive function (i.e., exposure to mentally stimulating activity, social engagement, and lifestyle) influence employment outcomes in PLWH (McGurk et al., 2016; Vance et al., 2015). Further, this study adds to the body of evidence that attitudes, thoughts, and behaviors associated with psychological health (i.e., the use of positive psychology techniques vs. neuroticism) and those associated with overall empowerment (self-efficacy, human capital, boundary setting, and assertiveness) influence the experience of employment and employment maintenance (through its impact on occupational productivity) (Annalena et al., 2015; Brody et al., 2014; Chang et al., 2015; Dale et al., 2014; Johnson et al., 2005; Karlsson et al., 2010; Kebriaei, 2016; Kennedy, 1995; Li et al., 2013; Macsinga et al., 2014; Mathisen & Bergh, 2016; Sverker et al., 2009; van Servellen et al., 2002; Wright et al., 2010).

Although there has been some concern in the past that employment may interfere with the ability for PLWH to properly manage their HIV infection (Amico et al., 2007; Sabin et al., 2008; Torres-Madriz et al., 2011), our findings contribute to the body of evidence that employment facilitates adherence to HIV care (Nachega et al., 2015). This is in alignment with previous evidence suggesting that employment is associated with improved physical health, emotional wellbeing, and quality of life for PLWH (Degroote et al., 2014; Wagener et al., 2014). Additionally, this study provides evidence that PLWH may not have symptomology which impairs productivity at work. While chronic disease has been associated with greater productivity loss in some populations (Bielecky et al.,

2015; Bokma et al., 2017; Bustillos & Trigoso, 2013; Leineweber et al., 2012), this study suggests that when chronic illness (such as HIV disease) is well managed, personal factors (i.e., psychological health, neurocognitive function, and empowerment) substantially moderate this impact.

However, this study is limited by the fact that the women represented in this study, likely exhibit certain personal characteristics, which have influenced their ability to gain access to employment, and function without substantial impairments to occupational productivity. In spite of the socioeconomic conditions associated with HIV disease, the women participating in our study demonstrate characteristics associated with resiliency. Additionally, this study is cross-sectional in nature, and thus, the directional impact of personal characteristics on occupational productivity, or vice-versa, cannot be concretely established. Furthermore, by virtue of their participation in WIHS, women in our study likely receive more comprehensive health care and access to resources, compared to other WLWH who are not enrolled in the study. However, this study serves as a starting point for understanding factors impacting employment outcomes among WLWH.

Future research is needed to better understand the individual differences moderating the impact of the environment on occupational productivity among WLWH, as well as the most efficient interventions to improve occupational disparities within this vulnerable population. Specifically, research and interventions aiming to improve socioeconomic status, physical and emotional wellbeing, cognition, and empowerment of WLWH are warranted. Access to higher education is a unique intervention, which must be considered for its broad impact on socioeconomic status, human capital (i.e., attitudes,

knowledge, and skillsets), and social capital (Darin-Mattsson et al., 2017; Worthington et al., 2012). Moreover, educational attainment is associated with improved physical, cognitive, and psychological health, and provides the experience and resources needed to navigate challenging situations and employment (Darin-Mattsson et al., 2017; Worthington et al., 2012). Although increasing access to higher education is certainly warranted, we recognize that more targeted interventions designed to improve knowledge and skillsets associated with employment may be necessary in the short-term, and beneficial as supplementary measures in the long-term. For example, purposeful, empowerment interventions designed to increase the knowledge and skillsets associated with improved psychological health and empowerment, along with strategic increases in social capital, may improve employment outcomes in WLWH (Barringer et al., 2017; Conyers, 2014; Martin, Steckart, & Arns, 2006). In addition, an expanded conceptualization of what constitutes vocational rehabilitation may improve employment outcomes. Expansion of vocational rehabilitation to include cognitive training, interpersonal and conflict skill management, and behavioral therapies to improve psychological wellbeing are supported to improve employment maintenance and should be considered in future interventions (Kordovski, Woods, Verduzco, & Beltran, 2017; Lecomte, Corbiere, & Lysaker, 2014; McGurk et al., 2016; Shamburger-Rousseau, 2016; Varekamp et al., 2011).

As we continue to understand the barriers and facilitators impacting employment for WLWH, the need for a more comprehensive, integrative approach to improve employment outcomes and quality of life becomes increasingly evident. The comprehensive impact of living with HIV has created complexities in addressing

disparities in employment, thus further driving disparities in health and quality of life. Academic researchers, clinical care providers, vocational rehabilitation specialist, and employers invested in a productive and diverse workforce must join in the conversation to better understand and address successful occupational and personal outcomes in a population coming forward as willing, able, and grateful to work.

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CHAPTER 5

CONCLUSIONS

While HIV is no longer considered a disability and employment is considered a social determinant of health, many women living with HIV (WLWH) are not employed. Thus, they do not attain the many benefits associated with employment (Dale et al., 2014; Dray-Spira et al., 2008; Foundation, 2013; Institute of Medicine, 2010). The evidence suggests that disparities in employment are heavily related to the socioeconomic status of WLWH, and its association with physical health, psychological health, social support, and empowerment (Barringer et al., 2017; Bielecky et al., 2015; Brüssow, 2013; Collaborative on Health and the Environment, 2019; Dale et al., 2014; Liu et al., 2013; Pellowski et al., 2013; Wright et al., 2010). Yet, the mechanisms influencing employment outcomes, and thereby, improved health and quality of life of WLWH, are largely unknown. The purpose of this dissertation was to examine the association of socioeconomic, psychosocial, and health-related contexts with employment and occupational productivity among WLWH enrolled in the Women's Interagency HIV Study (WIHS). Qualitative interviews were conducted to add contextual depth and breadth to the meaning and experiences of employment among WLWH.

The three manuscripts presented in this dissertation were written to provide a greater understanding of the comprehensive contexts influencing employment and occupational productivity among WLWH. Manuscript 1, *Employment and Occupational*

Productivity among Women Living with HIV: A Conceptual Framework, was written to provide a conceptual framework of the socioeconomic, psychosocial, and health related contexts influencing employment and occupational productivity among WLWH. Based on a comprehensive literature review, a conceptual framework is proposed, which describes the mechanisms by which socioeconomic status, physical health, psychological health, and empowerment influence employment and occupational productivity among WLWH. Manuscript 2, *Socioeconomic, Psychosocial, and Health-Related Contexts Associated with Employment among Women Living with HIV and Women at Risk for HIV in the United States*, presents the results of examining the relationships between socioeconomic, psychosocial, and health-related contexts and employment among WLWH and women at risk for HIV (WARH) in the United States. Based on the results of the analyses, it was concluded that employment was associated with improved socioeconomic status, quality of life, physical health, psychological health, and cognitive function among WLWH and WARH; and better HIV care management and outcomes among WLWH. Finally, Manuscript 3, *A Mixed-Methods Study Understanding the Psychosocial Context of Employment and Occupational Productivity among Women Living with HIV in the Southern United States*, was written to present the results of a mixed-methods analysis examining the relationships between socioeconomic, psychosocial, and health-related contexts and occupational productivity among employed WLWH in the Southern United States. In addition, the third manuscript was written to provide the results of thematic analysis exploring the meaning, experience, and contexts surrounding employment as described by employed WLWH. Based on the triangulation of the analyses presented within the manuscript, it was concluded that the perception of

employed WLWH was that HIV-infection had little impact on employment or occupational productivity. Rather, the integrated findings from the analyses suggested that attitudes, thoughts, and behaviors associated with empowerment, cognitive function, problem-solving capacity, and emotional coping and psychological health are associated with employment and occupational productivity among WLWH.

In consideration of the analyses presented through the three manuscripts of this dissertation, specific consideration should be given to the impact of the socioeconomic environment on physical health, psychological health, social support, and empowerment, and its influence on employment and occupational productivity among WLWH. This chapter will present the conclusions of this dissertation by briefly summarizing the results of the analyses within the contexts of the current literature. Implications for research, practice, and policy will follow.

Contexts Influencing Employment and Occupational Productivity among WLWH

Manuscript 1: *Employment and Occupational Productivity among Women Living with HIV: A Conceptual Framework,* presents a review of the literature related to the personal and socioeconomic contexts associated with employment and occupational productivity among WLWH. Based on the literature, it was concluded that HIV disease is a socioeconomic disease, enhancing disparities in physical health, psychological health, social support, and empowerment; and ultimately, influencing employment and occupational productivity among WLWH. A conceptual framework is presented portraying reciprocal relationships between each of these domains, and serving as a useful tool in the consideration of future research, interventions, and policy.

Empowerment is highlighted for its usefulness in improving physical health, psychological health, social support, and socioeconomic status through improvements in the ability to access the internal (i.e., emotional coping strategies and problem-solving techniques) and external resources (i.e., health care, housing, education, income) necessary to navigate the environment (including the occupational environment). The review of the literature, and framework presented as part of Manuscript 1, serves as a guide for the analyses conducted within this dissertation.

Manuscript 2: *Socioeconomic, Psychosocial, and Health-Related Contexts Associated with Employment among Women Living with HIV in the United States*, presents the associations between socioeconomic, psychosocial, and health-related contexts and employment among WLWH and WARH enrolled in the Women's Interagency HIV Study. Based on the analyses, it was concluded that employment is associated with better socioeconomic (i.e., education and household income), psychosocial (psychological health, cognitive function, and social support), and health-related outcomes (i.e., fewer comorbidities and better health behaviors). Specifically, among WLWH, employment is associated with greater viral suppression (HIV RNA ≤ 200 copies/ml), improved adherence to HIV-care appointments, and lower levels of internalized HIV stigma. Based on the results presented, it was concluded that employment does not interfere with the management of HIV-infection, or add to the negative psychosocial contexts associated with living with HIV. Rather, the socioeconomic and psychosocial contexts associated with living with HIV, were associated with employment outcomes among this vulnerable population. Although the analyses conducted were cross sectional in nature, the findings corroborate longitudinal

studies which support that employment is predictive of improved socioeconomic, psychosocial, and health-related outcomes; and unemployment predictive of worse outcomes within these domains(Hergenrather et al., 2015, 2015) Therefore, it was suggested that failure to facilitate employment among WLWH, is depriving them of the benefits associated with employment; thus, hindering their quality of life. The evidence presented in Manuscript 2 adds to the literature by portraying the current day contexts associated with employment in WLWH. A limitation of this research was that we were unable to evaluate the personal traits (such as personality, empowerment, and coping styles) which may moderate the impact of socioeconomic and psychosocial contexts on employment among WLWH. Thus, a qualitative aim was included in this dissertation to improve our understanding of the holistic contexts influencing employment among WLWH. (Additional limitations will be discussed later in this chapter.)

Manuscript 3: *A Mixed-Methods Study Understanding the Psychosocial Context of Employment and Occupational Productivity among Women Living with HIV,* presents the associations between socioeconomic, psychosocial, and health-related contexts and occupational productivity among WLWH. In addition, this manuscript presents the results of thematic analyses, related to the meaning and experience of employment among WLWH, and the contexts influencing the navigation of socioeconomic and occupational domains. The analyses presented in this manuscript add to the literature by addressing occupational productivity among WLWH.

Notably, only 38% of the WLWH included in these analyses perceived any impairment in occupational productivity or loss related to HIV disease. Rather, psychosocial attributes (i.e., psychological health, cognitive function, and empowerment)

and socioeconomic contexts (i.e., housing and education) were associated with occupational productivity and the overall experience of employment among this population. Notably, the evidence presented in this manuscript corroborates the existing literature that personal and social contexts influence productivity, and moderate the influence of health impairments among people with chronic disease (Garrow, 2016; Gosselin et al., 2013; Hutting, Heerkens, Engels, Staal, & Nijhuis-Van Der Sanden, 2014; Leineweber, Westerlund, Hagberg, Svedberg, & Alexanderson, 2012; van Scheppingen et al., 2015; Varekamp, van Dijk, & Kroll, 2013). Furthermore, the analyses presented in Manuscript 3 adds to the existing literature by painting a picture of how personal characteristics (i.e., empowerment, psychological health, interpersonal skills, organizational skills, and self-advocacy) influence employment and occupational productivity outcomes among this population. Particular behaviors and skill sets (i.e., stress management, positive psychological coping techniques, problem solving/organizational strategies, and assertiveness in meeting needs and managing confrontation in the workplace) are presented as facilitators to the successful navigation of the environment, influencing the experience and benefits associated with employment among WLWH.

Collectively, the evidence presented through these manuscripts provides a comprehensive and contemporary view of the current day contexts (i.e., socioeconomic, psychosocial, personal, and health-related contexts) influencing employment and occupational productivity among WLWH. Understanding what contexts, and how these contexts influence employment is critical to informing future research, interventions, and policies to reduce occupational disparities among WLWH. Yet, certain characteristics of

this research guide the need for future research efforts. The following section will discuss implications for future research, in consideration of the strengths and limitations of this dissertation.

Strengths, Limitations, and Implications for Future Research

This study was made possible through collaboration with the Women's Interagency HIV Study (WIHS), which provided access to data from nearly 2,000 WLWH and WARH, who are representative of the HIV epidemic in the United States. The WIHS collects invaluable data pertinent to the aims of this dissertation, including the socioeconomic, psychosocial, and health contexts associated with employment among WLWH and WARH in the U.S. Moreover, it provides current day insight into the contexts influencing employment in an era where the chronic management of HIV-infection is feasible, and employment a rationale and beneficial prospect among this population.

Yet, due to logistical restraints within this dissertation, the analyses conducted in this study were cross-sectional in nature. Therefore, the directional impact of the contexts associated with occupational productivity and employment can only be inferred from the context of the surrounding literature. However, the analyses conducted within this study corroborate the evidence from longitudinal studies in similar populations that employment is beneficial to health, and unemployment detrimental to health (Hergenrather et al., 2015, 2015). Future research efforts should include longitudinal studies to more clearly elucidate the direction of relationships between these contexts and employment and occupational productivity among WLWH.

Additionally, because this study utilized WIHS participant data, it needs to be acknowledged that participants received comprehensive socioeconomic, psychosocial, and health screenings every six months, which likely gives them increased access to resources which facilitate more positive outcomes compared to populations without this level of care. However, WIHS is a representative sample of the adult female population living with HIV and at risk for HIV in the U.S., and therefore, the relative distribution of social resources among the population should be innately portrayed. To more carefully elucidate the needs of the general population of WLWH and WARH in the U.S., future research should include women who have varying access to resources influencing employment and occupational productivity among WLWH and WARH.

Finally, the relationships investigated in this dissertation are complex and largely dependent upon personal traits (i.e., personality, resilience, emotional and social intelligence, locus of control) which we were unable to quantitatively measure in this dissertation research (Dale et al., 2014; Wright et al., 2010). A strength of this research was that it allowed for the qualitative exploration of the experience of employment among employed WLWH, which provided insight into the personal characteristics, traits and behaviors which influenced outcomes among WLWH. Although limitations existed within this dissertation, the results of this dissertation contributed to the body of science surrounding employment among WLWH, with implications for practice and policy. The implications of this research will be discussed in the following section.

Implications for Practice and Policy

The evidence presented in this dissertation suggests a reciprocal relationship between the socioeconomic environment, employment, and personal outcomes (i.e., physical health, psychological health, social support, and empowerment) among WLWH. Based on the results presented, and in consideration of and the current body of evidence, interventions and policies promoting occupational outcomes, should focus on a total worker health framework, which acknowledges the reciprocity between occupational and health outcomes (NIOSH, 2017). For example, health care providers should be educated about the benefits of employment for WLWH, and the comprehensive contexts (i.e., socioeconomic, psychosocial, and health-related) which may influence their access to employment. Congruent with this education, interventions and policies to improve the identification of vocational needs/barriers of WLWH (i.e., improved psychosocial functioning, housing stability, knowledge, training) and link them to appropriate services (i.e., psychosocial resources, vocational rehabilitation, educational outreach services) are suggested to improve personal and occupational outcomes (Gallant et al., 2011). Moreover, health care providers may need education concerning the unique historical trajectory of WLWH, which may impact their access to employment and occupational productivity once employed. For example, long-term disengagement from the workplace, the internalization of cultural stigmatization, and the negative impact of social isolation are suggested to impair both psychological and cognitive function. Thus, providers must be aware of these contexts, in order to link WLWH to appropriate interventions (i.e., cognitive behavioral therapy, cognitive training) in order to facilitate improved

occupational, and thus, health and quality of life outcomes among WLWH (Hemmati Sabet et al., 2013; Hofmann & Gomez, 2017; Vance, Fazeli, et al., 2019).

Socioeconomic disparities in resources and power have contributed to difficulties navigating the environment (including the work environment) for many WLWH. Thus, WLWH may benefit from interventions which enhance navigation of the environment and the ability to leverage resources within the personal and occupational domains. For example, interventions which support the development of communication, conflict management, and empowerment related skillsets (i.e., self-advocacy, self-esteem, and comfort with managing confrontation) are supported to improve social navigation and improve occupational outcomes; and thus, should be considered for WLWH (Brody et al., 2014; Jennifer et al., 2017; Johnson et al., 2005; Varekamp et al., 2009; Wright et al., 2010). Strategic peer support groups may also be beneficial in improving the ability to access and navigate the socioeconomic and occupational environment through the shared pool of knowledge, and improved access to the functional and emotional resources associated with employment (Barringer et al., 2017).

Finally, interventions to increase access to higher education must be considered as a strategy to improve occupational outcomes among WLWH. Educational attainment is associated with improved socioeconomic status, social influence, empowerment, and physical and psychological health; and thus, impacts employment and occupational productivity through a variety of mechanisms (Collaborative on Health and the Environment, 2019). Therefore, interventions to improve educational attainment must be considered. Whereas outreach programs aiming to improve applicant competitiveness, mentored programs to retain students and facilitate graduation, and financial assistance

have demonstrated effectiveness in similar populations, they should be considered for WLWH (Sosu, 2016; Wilson et al., 2012).

Conclusion

Based on the results of this three-manuscript dissertation, future research is warranted to understand the full contexts influencing quality employment and occupational productivity among WLWH. The results of this study support the complex interaction of socioeconomic, psychosocial, and health-related contexts, and employment and occupational productivity among WLWH. Yet future research is needed to address the limitations of this dissertation and to facilitate the attainment of the many benefits of employment among this population. Employment is now considered a social determinant of health. Failure to promote employment among WLWH deprives them of these benefits. Future research, interventions, and policies must recognize the holistic impact of these contexts on health, quality of life, and employment among WLWH, and take steps to alleviate disparities and empower vulnerable populations.

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APPENDIX A

UAB IRB APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 | irb@uab.edu

APPROVAL LETTER

TO: Wise, Jenni M

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)

DATE: 25-Jun-2018

RE: IRB-300001049
Occupational Health Outcomes in Women Living with HIV

The IRB reviewed and approved the Initial Application submitted on 18-Jun-2018 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review:	Expedited
Expedited Categories:	5, 7
Determination:	Approved
Approval Date:	25-Jun-2018
Approval Period:	One Year
Expiration Date:	24-Jun-2019

The following populations are approved for inclusion in this project:

- Pregnant Women

The following apply to this project related to informed consent and/or assent:

- Waiver (Partial) of HIPAA
- Waiver of HIPAA
- Waiver of Informed Consent Waiver
- of Consent Documentation Waiver
- of 24 Hour Waiting Period

Documents Included in Review:

- datacollection(aim1).180525
- Consent.Clean.180525
- Waiverconsentauth.180618
- interview.180521
- datacollection(aim2).180525
- PhoneScript(InitialContact).180525
- usepermission(SA1&2).180117
- pregnant.180525
- HSP.clean.180525
- Flyer.180608
- waiverdocumentation(aim3).180328
- othermisc(conceptapproval).180117

APPENDIX B

WOMEN'S INTERAGENCY HIV STUDY CONCEPT SHEET APPROVAL LETTER

WIHS Women's Interagency HIV Study

Principal Investigators

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Gina Wingood, ScD, MPH
Columbia University

Birmingham *(2013-present)*
Mirjam-Colette Kempf, PhD, MPH
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WDMAC
(Data Management & Analysis Center)
(1997-present)
Stephen Gange, PhD
Elizabeth Golub, PhD
Johns Hopkins University

January 17, 2018

Dear Dr. Wise,

Congratulations, your concept sheet **"Occupational Health Outcomes in Women Living with HIV"** has been approved by the WIHS Executive Committee. The tracking ("README") number assigned to this project is **W18003.** You should use this number in all correspondence up to and including publication.

The WIHS collaborator assigned to your project is Dr. Mirjam-Colette Kempf, mkempf@uab.edu. Please utilize this person as your point of reference to the WIHS in regards to the development and analysis of your study and eventual manuscript submission.

All analyses tied to this project should pertain to the proposed analyses in the approved concept sheet. If you wish to implement additional analyses, a new concept sheet must be drafted and submitted to the WIHS. Upon approval of the new concept sheet, a new tracking number will be assigned.

The pages following the comments contain information on how to proceed with your project, as well as contact information for key personnel.

We appreciate your involvement in the WIHS! Please don't hesitate to contact me if there is anything that we can do to facilitate your project.

Sincerely,

Phyllis C. Tien, MD

Phyllis C. Tien, MD
Chair, WIHS Executive Committee
Professor of Medicine, UCSF

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APPENDIX C

WIHS Study Design

WOMEN'S INTERAGENCY HIV STUDY

A. STUDY DESIGN

The Women's Interagency HIV Study (WIHS) is a multicenter longitudinal study funded by the National Institutes of Health (National Institute of Allergy and Infectious Diseases, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institute of Drug Abuse, National Cancer Institute, and National Institute of Mental Health) to investigate the progression of HIV disease in women.

WIHS I through IV were conducted at six clinical sites, including a New York City Consortium; the State University of New York at Brooklyn; a Washington, D.C., Consortium; a Los Angeles, Southern California Consortium; a San Francisco/Bay Area Consortium, and a Chicago Consortium. Beginning in January 2013, with WIHS V, the Los Angeles, Southern California Consortium was closed and four new sites in the Southern U.S. were added, including sites in Atlanta, Georgia; Chapel Hill, North Carolina; Miami, Florida; and Birmingham, Alabama/Jackson, Mississippi. Since 1998, the WIHS Data Management and Analysis Center (WDMAC) has been located at the Johns Hopkins University Bloomberg School of Public Health, in Baltimore, Maryland.

All study participants undergo an initial screening to determine study eligibility. If the study participant is willing to take part in the study and gives informed consent, she will participate in an in-depth interview, physical exam, and specimen collection.

The data collected at each visit will include the following: medical and health history, obstetric/gynecological and contraceptive history, health care utilization,

sexual behavior, usage of drugs and alcohol, psychosocial factors, sociodemographics, laboratory parameters and a physical and gynecological examination.

Initial enrollment into the WIHS occurred between October 1994 and November 1995. The total initial enrollment for the WIHS was 2,056 HIV-seropositve women and 569 HIV-seronegative women. The following chart reflects the numbers of HIV-seropositive and -seronegative women enrolled into the initial WIHS cohort at each site.

SITE	NUMBER OF POSITIVES	NUMBER OF NEGATIVES	**TOTAL ENROLLMENT**
Bronx	416	120	**536**
Brooklyn	312	86	**398**
Washington, D.C.	295	102	**397**
Los Angeles	421	112	**533**
San Francisco	338	90	**428**
Chicago	274	59	**333**
TOTALS	**2056**	**569**	**2625**

Between October 2001 and October 2002, the WIHS re-opened enrollment into the cohort. The following table shows the composition of the new WIHS recruits for each clinical site.

SITE	HIV +/AIDS-FREE/HAART-NAIVE	HIV +/AIDS-FREE/ HAART	HIV-	**TOTAL ENROLLENT**
Bronx	37	92	104	**233**
Brooklyn	48	98	70	**216**
Washington, D.C.	42	80	49	**171**
Los Angeles	32	117	79	**228**
San Francisco	52	39	61	**152**
Chicago	44	57	40	**141**
TOTALS	**255**	**483**	**403**	**1141**

Total enrollment for both initial and 2001/02 recruits is as follows:

SITE	NUMBER OF POSITIVES	NUMBER OF NEGATIVES	**TOTAL ENROLLMENT**
Bronx	545	224	**769**
Brooklyn	458	156	**614**
Washington, D.C.	417	151	**568**
Los Angeles	570	191	**761**
San Francisco	429	151	**580**
Chicago	375	99	**474**
TOTALS	**2794**	**972**	**3766**

Between January 2011 and December 2012, WIHS again opened enrollment, in order to replace those women who had died since the second enrollment (i.e., since October 1, 2002). Final numbers for this enrollment are as follows:

SITE	**HIV+**	**HIV-**	**TOTAL**
Bronx	38	2	40
Brooklyn	31	12	43
Washington, D.C.	41	21	62
Los Angeles	31	5	36
San Francisco	62	26	88
Chicago	73	27	100
TOTAL	**276**	**93**	**369**

For 2011/12 recruits, there were maximum targets allowed for both Latina/Hispanic women and for women with prior “clinical”AIDS diagnoses (this excludes women with only CD4 counts <200).

Latina/Hispanic women were kept to 10% of the maximum total target for all sites except LA, where the number of Latina/Hispanic women was kept to 20% of the maximum total target. Women with prior clinical AIDS diagnoses were kept to 10% of the HIV-positive target for each site. Sites were allowed to exceed these targets if they traded with another WIHS site, for example if the

Brooklyn site agreed to enroll fewer than their target number of Latina/Hispanic women then LA would be able to enroll over their target number of Latina/Hispanic women. These "trades" were to be coordinated with the WIHS IV replenishment coordinating committee (Mardge Cohen, Nancy Hessol, and Christine Alden).

In 2013, the LA site was defunded and four new sites were added to the WIHS: Atlanta WIHS, UNC WIHS, Miami WIHS, and UAB-MS WIHS. Enrollment totals as of September 11, 2015 for these sites are as follows:

SITE	**HIV+**	**HIV-**	**TOTAL**
UNC WIHS	148	50	198
Atlanta WIHS	185	87	272
Miami WIHS	106	40	146
UAB-MS WIHS, UAB site	84	28	112
UAB-MS WIHS, MS site	86	29	115
TOTAL	**609**	**234**	**843**

For the Southern sites, the Executive Committee decided that there would be no maximum target for total enrolled HIV-positive women with prior "clinical"AIDS diagnoses. This will ensure that the cohort enrolled at the Southern sites is representative of the epidemic in that part of the country.

B. RECRUITMENT STRATEGIES

The procedures used for recruitment may vary by site. Regardless of methods used, however, sites recruited HIV-seronegative and seropositive women the same way to ensure comparability of the cohorts. Sites reviewed and monitored enrollment demographics (including age, race, IDU and sexual behavior) to make certain the cohorts were matched.

For the purpose of the 2001/02 and 2011/12 recruits, while there were no specific high-risk criteria for the seronegative women, sites aimed to enroll high-risk seronegatives. High-risk behavior was defined as meeting one or more of the following criteria within one year prior to screening:

- Reported injection drug use, or use of crack, cocaine, heroin, or methamphetamine (2011/12 recruits only)
- Diagnosis by a health care provider with an STD
- Reported having unprotected sex with three or more men
- Reported having sex for drugs, money, or shelter

- Reported having sex with six or more men
- Reported having sex with known HIV-positive man

For WIHS V recruits, seronegative women enrollees must meet one of the below listed high-risk exposure criteria within the five years prior to screening in order to enroll:

- Reported injection drug use, or use of crack, cocaine, heroin, or methamphetamine
- Diagnosis by a health care provider with an STD
- Reported having unprotected sex with three or more men
- Reported having sex for drugs, money, or shelter
- Reported having sex with six or more men
- Reported having sex with known HIV-positive man
- Partner reported injection drug use, or use of crack, cocaine, heroin, or methamphetamine
- Partner diagnosed by a health care provider with an STD
- Partner reported having unprotected sex with three or more women or men
- Partner reported having sex for drugs, money, or shelter
- Partner reported having sex with six or more women or men
- Partner reported having sex with known HIV-positive woman or man

C. MONITORING OF NEW RECRUIT ENROLLMENT

WDMAC set up a report in Apollo (the web-based data management system) for tracking characteristics of new enrollees. The report utilizes data from the *Eligibility Form (EL)* and displays:

(1) characteristics of women enrolled at the site (i.e., categories of IDU status and race/ethnicity, and distribution of ages) cross-tabulated with enrollment group (e.g., HIV-, HIV+), and (2) site- specific targets for enrollment.

Sites reviewed and monitored recruitment on the local site level to ensure comparability of the cohorts. For 2001/02 recruits, these reports were reviewed on a monthly basis by the Admin/Stat working group. For 2011/12 recruits, these

reports were reviewed regularly by PDs to ensure that targets were being met but not exceeded.

For the 2011/12 enrollment, those recruits that need extra monitoring include those who are Latina/Hispanic and those with prior "clinical" AIDS diagnoses (excludes prior CD4 count <200). To ensure that sites do not overenroll in these categories, maximum targets have been established by site. For Latina/Hispanic women, no more than 10% of the maximum total target should be enrolled for all sites except LA, where the number of Latina/Hispanic women should be kept to 20% of the maximum total target. For women with prior "clinical" AIDS diagnoses, no more than 10% of the HIV-positive target for each site should be enrolled. Please check with your site PD prior to enrolling any new participant to ensure that targets are not exceeded in any category.

D. ELIGIBILITY CRITERIA

1. WIHS ELIGIBILITY CRITERIA FOR 1994/95 RECRUITS
   Women must meet the following criteria to be eligible to participate in the WIHS:

   - Women must be 13 years old or older. There is no restriction on the upper age limit. Individual sites may set their own (more restrictive) limits to satisfy local IRBs.
   - Women must be able and willing to give informed consent.
   - Women must agree to be re/tested for HIV for the WIHS.
   - Women must be able to complete the interview in English or Spanish.
   - Women must be able to travel to and from the site/clinic and participate in a baseline visit as an outpatient.
   - Women must be willing and able to have blood drawn for laboratory testing by venous or arterial access.

2. WIHS ELIGIBILITY CRITERIA FOR 2001/02 RECRUITS
   Women must meet all of the above criteria in addition to the following:

   - If HIV-positive, women must be free of clinical AIDS-related conditions evidenced through both self-report and any medical record abstractions that are performed. In screening, the women will not be asked to self report cervical cancer due to the large amount of over-reporting that occurs in the WIHS. Instead, participants will be asked about cervical cancer during their baseline interview. Additionally, if a woman self-reports an AIDS-defining condition during screening that sites can refute through medical record abstraction, the woman will still be eligible for enrollment.

- Documented HAART and pre-HAART CD4 counts and HIV RNA quantification, if appropriate (i.e., HIV-positive, self-reported HAART).
- If hardcopy documentation of a positive result from both an HIV ELISA test and a confirmatory Western Blot are available, blood need not be drawn and women need not agree to be retested for HIV.
- Women must consent to have their specimens stored in the WIHS national repository. Women who acquired HIV perinatally will not be eligible for enrollment.

3. WIHS ELIGIBILITY CRITERIA FOR 2011/12 RECRUITS
   Women must meet all of the above criteria, in addition to the following:
   - HAART users must have started their first HAART regimen subsequent to December 31, 2004, unless the HAART use was during pregnancy or for PEP/PrEP only.
   - Women must be between ages 30 through 55 for HIV-positive recruits; ages 35 through 60 for HIV-negative recruits.
   - Women must not have ever used ddI (Videx, didanosine), ddC (Hivid, zalcitabine) or d4T (Zerit, stavudine) unless use was **only** during pregnancy or for PEP/PrEP.
   - Women may not be on non-HAART ART at time of enrollment and must not have used ART before starting HAART, unless use was **only** during pregnancy or for PEP/PrEP.
   - Women must be biologically female at birth

NOTE: Participants with prior "clinical" AIDS diagnoses are eligible for enrollment in 2011/12 as long as the total number enrolled doesn't exceed 10% of the total HIV-positive target.

4. WIHS ELIGIBILITY CRITERIA FOR WIHS-V RECRUITS
   Women must meet all of the above criteria, except for the prior age criteria, which have changed as noted below:
   - Women must be between ages 25-60 for both HIV-positive and HIV-negative recruits.

NOTE: Participants with prior "clinical" AIDS diagnoses are eligible for enrollment in WIHS-V. There is no cap on the total percentage of HIV-positive women allowed to have a prior clinical AIDS diagnosis.

5. COENROLLMENT
   For the 1994/95 recruits, women were ineligible for enrolling in the WIHS if they were currently participating in similar studies. These included:

- WITS (Women and Infant Transmission Study)
- HERS (HIV Epidemiology Research Study)
- Other studies that may be active at the site

Sites with other local studies that conflicted with full participation in the WIHS brought this to the attention of the WIHS Executive Committee. The Executive Committee decided whether participation in the other study deemed the participant ineligible for the WIHS.

These coenrollment exclusions are not pertinent to the new recruits. If a woman becomes pregnant while enrolled in the WIHS, she may co-enroll in the WITS.

However, a woman should not be enrolled as a new recruit in the WIHS if she is already enrolled in the WIHS through another site or subsite.

E. SCREENING AND ENROLLMENT PROTOCOL FOR NEW RECRUITS

Screening procedures vary from site to site. Some sites recruited participants primarily from their current clinic population, approaching women at the time of their care visits. Under this scenario, sites had complete access to medical records, allowing them schedule the screening "visit" on the same day as enrollment and administration of the baseline visit. Other sites recruited women from outreach centers and community populations, requiring those sites to request medical records for abstraction. Women recruited through these procedures needed to have a separate screening visit, followed by chart abstraction and an enrollment visit. While part of the reason for a separate screening and baseline visit was to ensure women remain committed to the study, women who would be identified through clinic populations are not at as large a risk for loss to follow-up, while the women more at risk (i.e., recruited from the community) would be required to have separate visits.

For 2001/02 recruits, where possible, sites aimed for enrollment of 10-15% over the projected numbers. This over-enrollment was in anticipation of the loss to follow-up expected to occur between the first and second visits of the new recruits.

The procedures outlined in this section are meant to be flexible. Sites could accommodate the actual screening procedures to fit best with their site's enrollment

plan. Whether on the same or separate days, screening and enrollment should contain the following and happen in the following order:

1. SCREENING VISIT
    a. Screening ID
    Assignment of unique Screening IDs will be the responsibility of the site. Sites may use characters and/or numbers for the Screening ID.
    b. Consent Forms
        - Screening consent forms
        - Medical record release forms (if indicated)
        - HIV antibody testing consent, including counseling (if indicated)
    c. *Screening Form (SCR)* (interviewer-administered or filled out by the site)
    The *Screening Form* will collect information on consent dates, race, age, AIDS-defining illnesses, antiretroviral medication history, and behavioral information on IDU and high-risk sexual behavior. Parts of this form will be data entered, but only if a participant is enrolled into the WIHS. If sites choose to obtain the information for this form without administering the form to the participant, they must be sure to obtain all required consents and to document the participant's language preference.
    d. Lab specimens / tests
    L01: HIV test. (See **Section 4F** for details on indications for this test.)
    e. Participant locator form (site-specific form)
2. Medical Record Abstraction (MRA)
    a. Indications for MRA
        i. Self-reported Highly Active Antiretroviral Therapy (HAART) user (HIV+ women only)
            1. If a participant reports in her screening interview that she has ever taken one of the following:
                - any protease inhibitor (PI);
                - any non-nucleoside reverse transcriptase inhibitor (NNRTI);
                - Ziagen (abacavir) or Viread (tenofovir) or Trizivir (ABC + AZT + 3TC) or Truvada (tenofovir + FTC);
                - HAART, cocktails, or three-drug combination therapy;
                - an entry or integrase inhibitor (i.e., Fuzeon,

                Selzentry or Isentress); then sites must verify the

                required therapy information on the *Retroactive*

Abstraction (RAB) Form through MRA. Abstractionists should begin abstraction of therapy information with medical records six months prior to the earliest reported date of any of the therapies listed above.

2. If a participant reports use of HAART only during a pregnancy and is HAART naïve otherwise, this woman should be classified as "HIV+/HAART," and sites must verify the required therapy information on the *RAB Form* through MRA. An appropriate note of this information should be recorded on the *RAB Form* in the question that asks specifically about pregnancy and HAART use.
3. If a participant was prescribed HAART according to the medical records, took HAART for a very short time, and then stopped HAART almost immediately, this woman should be categorized in the HIV+/HAART enrollment category, and date of first HAART prescription should be noted on the *RAB Form*. A note can be made in the additional comment field documenting the short-term use of HAART.
4. If a participant reports that she has never taken any of the therapies listed in (1) above, then sites do not have to verify this report through MRA. These women should be put in the "HIV+/HAART naïve" category if they are otherwise eligible for enrollment.

NOTE: As of December 3, 2001, medical record abstraction must be performed on all participants who report that they are HAART naïve. For those women who have already been enrolled into the study, retrospective medical record abstraction must be performed. The review on these participants is limited to the medical record charts held by the participant's current primary care provider (PCP). If a participant does not have a PCP, no review is required.

If use of HAART is found during medical record abstraction, sites should classify the participant as HAART-experienced on the *Eligibility Form (EL)* and a *RAB Form* should be completed. If a participant was already enrolled as HAART naïve, but abstraction shows that HAART was taken, edit her *Eligibility Form* so that she is reclassified as HAART-experienced, and complete a *RAB Form*. If she was enrolled as HAART naïve and her current primary care chart confirms this, no further action is needed.

5. If a participant reports taking antiretroviral medications (in general or a specific ART class) but cannot remember the exact name of the medication(s), sites must review the medical records

to abstract the date of HAART initiation. This information must be recorded on the *RAB Form*. If the participant is unable to provide enough information to enable chart review (place and approximate date) or if records cannot be obtained or if the records do not accurately document her as HAART naïve or her first HAART date, then the participant is ineligible for enrollment.

ii. Self-reported AIDS-defining conditions (HIV+ women only)

1. No abstraction is required for self-reported AIDS-defining conditions.
2. If a 2001/02 enrollment candidate reports ever having had a clinical AIDS-defining illness, she is initially not eligible for enrollment. Sites have the following options:

   - Sites can perform chart abstraction to refute this report. If sites can document through MRA that the report was false, then a note should be made in the "Additional Comments" section of the *RAB Form* and the woman will be eligible for enrollment.
   - If sites do not perform chart abstraction to refute the reported AIDS-defining illness, the woman is permanently ineligible for enrollment.

   There are a few potentially problematic conditions that a woman may say "YES" to that are, in fact, not AIDS-defining illnesses. Conditions that might be erroneously reported, and that might warrant further review through record abstraction, include oral versus candida esophagitis, candida in the lungs/airways, herpes simplex virus or HSV (cutaneous x 30 days, lungs or esophagus; the AIDS-defining herpes is the chronic presence, without remission of a single ulceration), wasting, non-PCP pneumonia, the diarrheas, tuberculosis, and salmonella. If a participant reports "YES' to any of these conditions, a designated person at

NOTE: If a 2011/12 enrollment candidate reports a prior "clinical" AIDS diagnosis, she will be eligible for enrollment as long as the total number enrolled doesn't exceed 10% of the total HIV-positive target. There is no cap on the total percentage of WIHS-V HIV-positive enrollees who can have prior clinical AIDS.

the site (with a reasonable amount of clinical experience) should determine whether this participant is eligible or ineligible for enrollment. Provider reports should be used for verification where necessary.

Retrospective Abstraction Form (RAB)
This form will capture the antiretroviral therapy data that is abstracted from the medical records. This form will be data entered for all women enrolled in the WIHS who are indicated for MRA at the screening/enrollment visit.

There is a section of the form that captures abstraction data that is required for an individual to be eligible for the study, and a section that captures abstraction data that is supplemental information and not required for an individual to be eligible for the study. ALL abstraction information in the required section must be complete for a participant to be eligible for enrollment into the WIHS, with the exception of (1) prescribed dosages for first HAART regimen, and (2) CD3 and CD8 cell counts and percentages.

i. Required MRA information
    1. Information indicating whether the participant was ever on HAART
    2. Date that HAART was first prescribed
    3. Drugs that comprised first HAART regimen (and start date of each)
    4. At least one blood draw at, or within six months prior to, initial HAART date for which both a HIV RNA result and a T-cell count are available

ii. Supplemental MRA information (sites have the option of gathering or not gathering these data based on their access to medical records and abstractionists)
    1. Participant's weight at HAART initiation or within three months prior to HAART initiation, and date at which weight was measured
    2. Participant's use of ART prior to first HAART date
    3. Additional HAART regimens participant was prescribed after her initial HAART regimen
    4. Additional HIV RNA results and T-cell counts prior to the required markers listed above and within six months of HAART initiation
    5. All available HIV RNA results and T-cell counts post HAART initiation

3. ENROLLMENT VISIT
    a. WIHSID
    All women enrolled into the WIHS will be assigned an 8-digit WIHSID. (See Section 11 of the MOO for details as to how WIHSIDs are

assigned.) Assignment of the WIHSID will be the responsibility of the site.

b. *Eligibility Form (EL)*
This form is filled out by site personnel to determine whether or not a screening candidate is eligible for enrollment into the WIHS. Much of this information can be obtained from the *Screening Form (SCR)*. To be deemed eligible for enrollment, women should have a completed *SCR Form* and a completed *EL Form* that indicate the participant is eligible and has agreed to enroll into the WIHS.

c. Consent Forms for enrollment into the WIHS

d. Interview Forms / Medical Exams / Laboratory

specimens and tests See **MOO, Section 6**

(*Overview of the Baseline Visit for New Recruits*).

e. Substudy recruitment
Substudy recruitment should follow the same procedures outlined for the original recruits in

MOO, Section 7.

f. Post-test HIV counseling (if indicated)

F. HIV TESTING

1. HIV TESTING FOR 1994/95 RECRUITS
HIV testing (or retesting) is required of all women participating in the WIHS. The testing may be done either at the time of screening, between screening and the first baseline visit, or at the time of the baseline visit.

Results from HIV testing that occurred prior to screening may be used to provide provisional HIV serostatus for the *Screening Form*. These results, however, are only provisional; <u>all women</u>, <u>regardless of known serostatus</u> will need to be retested before enrollment into the WIHS. Once the WIHS HIV test is done and the appropriate laboratory form completed and data entered, it is these results which will trigger the woman's classification. No other results will be acceptable for actual HIV status and classification.

If a woman tests HIV-seronegative at screening or between screening and the baseline visit, she must have her baseline visit within 30 days (and no longer than 60 days) of the seronegative test. The reason for this window is to minimize the possibility that the woman will seroconvert by the time baseline study visit data are collected on her.

Please note that sites should use their judgment to determine if it is appropriate to proceed immediately into the baseline visit on the same day a woman is told about her HIV test results, particularly if it is the first time she has been tested for HIV.

2. HIV TESTING FOR NEW (2001/02, 2011/12, and WIHS-V) RECRUITS
HIV testing is required for all women participating in the WIHS who report that they are HIV- negative. HIV-positive women are not required to be retested for HIV if there is hardcopy documentation of a positive ELISA/IMMUNOASSAY test with a confirmatory test as detailed on the L01 form. Hardcopy results of this test must be transferred to a WIHS *Form L01 (HIV 1/2 Testing Results)* and data entered into the WIHS database. If sites are unable to provide this documentation, self-reporting HIV-positive women must be retested.

   If a woman tests HIV-seronegative at screening or between screening and the baseline visit, she must have her baseline visit within 30 days (and no longer than 60 days) of the seronegative test. The reason for this window is to minimize the possibility that the woman will seroconvert by the time baseline study visit data are collected on her.

   Please note that sites should use their judgment to determine if it is appropriate to proceed immediately into the baseline visit on the same day a woman is told about her HIV test results, particularly if it is the first time she has been tested for HIV.

APPENDIX D

GENERALIZED ANXIETY DISORDER 7- ITEM SCALE

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
Add the score for each column	+	+	+	
Total Score *(add your column scores)* =				

Figure 1. Generalized Anxiety Disorder 7-item Scale. Reprinted with permission. Spritzer, R.L. Kroenke, L., Williams, J.B. and Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Arch Intern Med., 166*:1092-1097.

APPENDIX E
HIV STIGMA SCALE – NEGATIVE SELF IMAGE SUBSCALE

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. Having HIV/AIDS makes me feel that I'm a bad person.	1	2	3	4
b. I feel I'm not as good as others because I have HIV/AIDS.	1	2	3	4
c. Having HIV/AIDS makes me feel unclean.	1	2	3	4
d. Having HIV/AIDS is disgusting to me.	1	2	3	4
e. People's attitudes about HIV/AIDS make me feel worse about myself.	1	2	3	4
f. I feel guilty because I have HIV/AIDS.	1	2	3	4
g. I never feel ashamed of having HIV/AIDS.	1	2	3	4
h. I feel discriminated against in health care settings because of my HIV status.	1	2	3	4

Figure 2. Negative self image subscale of the HIV Stigma Scale. Reproduced with permission from Berger, E., Ferrans, C.E., and Lashley, R.L. (2001). Measuring Stigma in People with HIV: Psychometric Assessment of the HIV Stigma Scale. *Research in Nursing & Health, 24*(6): 518–529.

APPENDIX F

CENTER FOR EPIDEMIOLOGICAL STUDIES DEPRESSION SCALE AND SCORESHEET

Instructions: Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week by checking the appropriate space.

During the past week	Rarely or none of the time (less than 1 day)	Some or a little of the time (1–2 days)	Occasionally or a moderate amount of the time (3–4 days)	Most or all of the time (5–7 days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family or friends.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not get “going.”				

During the past week	Rarely or none of the time (less than 1 day)	Some or a little of the time (1–2 days)	Occasionally or a moderate amount of the time (3–4 days)	Most or all of the time (5–7 days)
Total Score:				

During the past week	Rarely or none of the time (less than 1 day)	Some or a little of the time (1–2 days)	Occasionally or a moderate amount of the time (3–4 days)	Most or all of the time (5–7 days)
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt that I was just as good as other people.	3	2	1	0
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	3	2	1	0
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	3	2	1	0
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	3	2	1	0
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get “going.”	0	1	2	3
Total Score:				

Figure 3. Center for Epidemiological Studies Depression Scale and Scoresheet available from https://www.ncbi.nlm.nih.gov/books/NBK64056/. Original scale attributed to Radloff, L. S. (1977). The CES-D scale: A self report depression scale for research in the general population. *Applied Psychological Measurements, 1*, 385-401.

APPENDIX G

PERCIEVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way. Scores are obtained by reversing responses to the four positively stated items (items 4, 5, 7, & 8) and then adding all items for a total score.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happenedunexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Figure 4. The Perceived Stress Scale. Reprinted with permission. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385-396

APPENDIX H

MOS SOCIAL SUPPORT SURVEY INSTRUMENT:

EMOTIONAL/INFORMATIONAL AND TANGIBLE SUBSCALES

Directions: People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it? Choose one number for each line. To obtain a score for each subscale, calculate the average of the scores for each item in the subscale.

None of the time = 1. A little of the time = 2. Some of the time = 3.
Most of the time = 4. All of the time = 5

Emotional/informational support

Someone you can count on to listen to you when you need to talk
Someone to give you information to help you understand a situation
Someone to give you good advice about a crisis
Someone to confide in or talk to about yourself or your problems
Someone whose advice you really want
Someone to share your most private worries and fears with
Someone to turn to for suggestions about how to deal with a personal problem
Someone who understands your problems

Tangible support

Someone to help you if you were confined to bed
Someone to take you to the doctor if you needed it
Someone to prepare your meals if you were unable to do it yourself
Someone to help with daily chores if you were sick

Figure 5. Emotional/informational and tangible subscales of the MOS Social Support Survey Instrument. Scale originally attributed to Sherbourne, C.D., & Stewart, A.L. (1991). The MOS social support survey. *Social science & medicine, 32 6*, 705-14.

APPENDIX I

PERSONAL PROGRESS SCALE – REVISED

Directions: The following statements identify feelings or experiences that some people use to describe themselves. Please answer each question in terms of any aspects of your personal identity that are important to you as a woman, such as gender, race, ethnicity, culture, nationality, sexual orientation, family background, and so on. *Items in bold are reversed scored.

Almost never Sometimes true Almost always
1----------2----------3----------4----------5----------6----------7

1. I have equal relationships with important others in my life.
2. It is important to me to be fi nancially independent.
3. It is diffi cult for me to be assertive with others when I need to be.
4. I can speak up for my needs instead of always taking care of other people's needs.
5. I feel prepared to deal with the discrimination I experience in today's society.
6. It is diffi cult for me to recognize when I am angry.
7. I feel comfortable in confronting my instructor/counselor/supervisor when we see things differently.
8. I now understand how my cultural heritage has shaped who I am today.
9. I give in to others so as not to displease or anger them.
10. I don't feel good about myself as a woman.
11. When others criticize me, I do not trust myself to decide if they are right or if I should ignore their comments.
12. I realize that, given my current situation, I am coping the best I can.
13. I am feeling in control of my life.
14. In defi ning for myself what it means for me to be attractive, I depend on the opinions of others.
15. I can't seem to make good decisions about my life.
16. I do not feel competent to handle the situations that arise in my everyday life.
17. I am determined to become a fully functioning person.
18. I do not believe there is anything I can do to make things better for women like me in today's society.
19. I believe that a woman like me can succeed in any job or career that she chooses.
20. When making decisions about my life, I do not trust my own experience.
21. It is difficult for me to tell others when I feel angry.
22. I am able to satisfy my own sexual needs in a relationship.
23. It is diffi cult for me to be good to myself.
24. It is hard for me to ask for help or support from others when I need it.
25. I want to help other women like me improve the quality of their lives.
26. I feel uncomfortable in confronting important others in my life when we see things differently.
27. I want to feel more appreciated for my cultural background.
28. I am aware of my own strengths as a woman.

Figure 6. Personal Progress Scale-Revised. Reproduced with permission. Johnson, D. M., Worell, J., & Chandler, R. K. (2005). Assessing psychological health and empowerment in women: The Personal Progress Scale Revised. *Women & Health, 41*(1), 109–129.

APPENDIX J

STANFORD PRESENTEEISM SCALE-6

Below we would like you to describe your work experiences in the **past month.** These experiences may be affected by many environmental as well as personal factors and may change from time to time. For each of the following statements, please indicate one of the following responses to show your agreement or disagreement with this statement in describing *your* work experiences in the past month.

PLEASE USE THE FOLLOWING SCALE:
1 = if you strongly disagree with the statement
2 = if you somewhat disagree with the statement
3 = if you are uncertain about your agreement with the statement
4 = if you somewhat agree with the statement
5 = if you strongly agree with the statement

		Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
B1.	Because of my HIV infection, the stresses of my job were much harder to handle.	1	2	3	4	5
B2.	Despite having my HIV infection, I was able to finish hard tasks in my work.	1	2	3	4	5
B3.	My HIV infection distracted me from taking pleasure in my work.	1	2	3	4	5
B4.	I felt hopeless about finishing certain work tasks, due to my HIV infection.	1	2	3	4	5
B5.	At work, I was able to focus on achieving my goals despite my HIV infection.	1	2	3	4	5
B6.	Despite having my HIV infection, I felt energetic enough to complete all my work.	1	2	3	4	5

Figure 7. Stanford Presenteeism Scale-6 Adapted for people living with HIV. Available from McClain E. (2013). Critical Synthesis Package: Stanford Presenteeism Scale (SPS-6). *MedEdPORTAL*, *9*:9602. https://doi.org/10.15766/mep_2374-8265.9602. Original scale attributed to Koopman, C., Pelletier, K.R., Murray, J.F., Sharda, C.E.,…& Bendel, T. (2002) Stanford presenteeism scale: health status and employee prodcutivity. *J Occup Environ Med., 44*(1):14-20.

APPENDIX K

VARIABLES OF INTEREST ASSESSED THROUGH LINE ITEM RESPONSE

Table 1. Variables of Interest Assessed Through Line Item Responses

Concept	Operationalization
Socioeconomic Status	• Race • Education • Relationship status
Housing Insecurity	• Where are you living now? • How long have you stayed at the place you stayed last night?
Abuse	• Since your (MONTH) study visit, have you experienced serious physical violence (physical harm by another person)? By that I mean were you ever hurt by a person using an object or were you ever slapped, hit, punched, kicked?
Childcare Responsibility	• How many children under nineteen years of age are you responsible for? • Relationship to child • How many hours per day or per week do you provide childcare?
Utilization of Medical Services	• In the last six months, did you miss any scheduled regular HIV care appointments?
Adherence to Medication Regimen	• Since your (MONTH) study visit, have you taken any antiretroviral medications? • In general, over the past six months, how often did you take your antiretrovirals as prescribed?
Employment	• How many hours per week or per month do you work?