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**Individual Characteristics and Vocational Rehabilitation Services as Predictors of
Employment for State/Federal Vocational Rehabilitation Consumers with
HIV/AIDS**

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**Individual Characteristics and Vocational Rehabilitation Services as Predictors of
Employment for State/Federal Vocational Rehabilitation Consumers with
HIV/AIDS**

by

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DEDICATION

To God who has allowed me to begin and finish this long journey and who has provided
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**Individual Characteristics and Vocational Rehabilitation Services as Predictors of
Employment for State/Federal Vocational Rehabilitation Consumers with
HIV/AIDS**

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With greater advancement in medical treatments for individuals with Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS), a growing numbers of individuals living with HIV/AIDS are contemplating returning to the workplace. However, they have been faced with barriers to employment and have demonstrated a need for vocational rehabilitation (VR) services. The purpose of this study was to identify predictors of employment outcomes of individuals living with HIV/AIDS, who used the state/federal VR program services, using the Rehabilitation Services Administration (RSA-911) data file from Fiscal Year 2006.

Data analyses were conducted using descriptive statistics, bivariate analyses (chi-square analyses, independent t-tests, and ANOVAs), and binary logistic regression using cross validation. Results of the study indicated that of socio-demographic, health, and VR service variables, service variables were only found to be significantly related to employment outcomes. Job search assistance, job placement assistance, and on the job

support were found to be significant predictors of successful employment outcomes at closure. In addition, higher costs of purchased services increased the likelihood of being employed at closure. However, the longer the length of VR program participation was, the lower the likelihood of being employed at closure was.

Among participants with successful employment outcomes at closure, differences were significant between participants earning less than \$200.00 per week and participants earning equal to or higher than \$500.00 per week. Participants with less than \$200.00 of weekly earnings were more likely to be African Americans, to have lower education levels than an associate degree at closure, to have service occupations or clerical and sales occupations, and to receive SSI, SSDI, Medicaid, and Medicare. On the other hand, participants with equal to or more than \$500.00 weekly earnings were more likely to be White, to have higher education levels than an associate degree, and to have professional and managerial occupations and were less likely to receive SSI, SSDI, Medicaid, and Medicare. In addition, they were more likely to receive assessment, VR counseling and guidance, college or university training, job search assistance, transportation, maintenance, and information and referral services compared to those with less than \$200.00 weekly earnings. Implications for practice and suggestions for future research are discussed.

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CHAPTER 1

INTRODUCTION

Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) are no longer perceived as one of the leading causes of death. Instead, they are now considered a chronic illness because medical advances such as the use of combination therapies of antiviral medications have improved the health and lifespan of people living with HIV or AIDS (HIV/AIDS) (Goldblum & Kohlenberg, 2005; Hunt, Jaques, Niles, & Wierzalis, 2003; McReynolds, 2001; Parniak, 2004; Walch, Lezama, & Giddie, 2005).

Since AIDS was first reported in the United States in 1981, the number of people with HIV/AIDS has continued to increase in the United States. The Centers for Disease Control and Prevention (CDC) estimated that 850,000 - 950,000 people were living with HIV in the U.S. at the end of 2004 (CDC, 2004) and more than one million people in 2006 (CDC, 2006). In addition, approximately 40,000 individuals are infected with HIV every year.

The proportion of people living with HIV/AIDS in the U.S. has changed since the early years of HIV infection were reported. Whereas white males who were homosexual and using injection drugs were prominent in the 1980's, the epidemic has increased among non-white populations, females, and heterosexuals (Berry & Hunt, 2005). For example, the proportion of females with AIDS increased from 7% in 1981 to 21% in 1996 and to 27% between 2001 and 2004 (CDC, 2006). The distribution of new cases by race/ethnicity has also greatly changed. The proportion of new cases in non-Latino whites

dropped from 60% in 1981 to 28% between 2001 and 2004. On the other hand, the proportion of new cases in non-Latino African Americans rose from 25% in 1981 to 50% between 2001 and 2004, and the overall proportion of Latinos rose from 14% to 20% (CDC, 2006).

In the early 1980s, very little information was known about the disease and possible medical treatments (Conyers, 2005), and AIDS cases dramatically increased between 1981 and 1995 (CDC, 2006). However, the introduction of antiretroviral therapy in 1996 started decreasing the number of AIDS cases as a result of extended length of time from HIV infection to AIDS diagnosis, as well as the reduced rates of AIDS-related deaths (Qian, Taylor, Fawal, & Vermund, 2006).

Until advanced treatments were introduced in the 1990's, termination from work was certain for many people living with HIV/AIDS as the majority faced imminent death (Glenn, Ford, Moore, & Hollar, 2003). However, improved health and life span as a result of recent medical advances have increasingly motivated people with HIV/AIDS to consider reentering the workforce, obtaining a new job, or maintaining their current employment (Brooks & Klosinski, 1999).

Public and governmental interest in employment issues has also contributed to the changing trend by finding ways to forestall work loss among people with HIV/AIDS. Their agenda is simple; employment not only positively impacts the individual, but it also has economic benefits for society (Massagli, Weissman, Seage, & Epstein, 1994). In addition to the Americans with Disabilities Act of 1990 (ADA) that protects people with HIV/AIDS against discrimination in employment and provides accessibility to services,

the Ticket to Work and Work Incentives and Improvement Act of 1999 has also increased the motivation of people with HIV/AIDS to work. This legislation provides more options for employment (e.g., the option of maintaining Medicare coverage while working) (Back, 1993; Burns et al., 2007).

Statement of the Problem

With greater advancement of medical treatments for HIV/AIDS, the focus of those living with HIV/AIDS has been increasingly geared to returning to work or maintaining current employment. For instance, in the study by Brooks, Martin, Ortiz, & Veniegas (2004), a significant proportion (74%) of the 757 unemployed participants was considering returning to the workforce. The changes in perceptions of people living with HIV/AIDS with relation to employment have been reported in a number of employment-related studies. In addition to medical advances, various components of positive impacts from working including financial, psychological, and emotional benefits have gradually increased the desire of people living with HIV/AIDS to work. The economic burden of HIV/AIDS in the U.S. may decrease with an increase in employment rates of people living with HIV/AIDS.

In spite of the increasing need for employment, however, individuals living with HIV/AIDS have been faced with various difficulties and barriers to employment (e.g., health problems and lack of accommodations) and have demonstrated a need for vocational rehabilitation services that may enable them to successfully obtain and remain in employment.

Increased Desire to Work

Work has been understood as a critical and major human function in society (Richardson, 1993), and closely related to psychological and psychosocial functioning for people living with chronic and life-threatening illnesses (Koch, Rumrill, Roessler, & Fitzgerald, 2001). The significance of employment has been recognized for people who are dealing with a life-threatening disease especially in obtaining (a) financial benefits and (b) regaining positive self-perceptions. These positive aspects of employment explain the desire of people living with HIV/AIDS to return to work (Braveman, Helfrich, Kielhofner, & Albrecht, 2003; Brooks & Klosinski, 1999; Campbell, 1998; Conyers, 2004a, 2004b; Hergenrather, Rhodes, & Clark, 2005, 2006; Hunt et al., 2003; McReynolds, 2001; Timmons & Fesko, 2004).

Financial Benefits

Experiencing financial difficulty has been a strong motivation for working and earning an income (Brooks & Klosinski, 1999; Conyers, 2004b; Hergenrather et al., 2005, 2006; Timmons and Fesko, 2004). Income through work allows unemployed individuals living with HIV/AIDS to become more independent and lessen the need for public assistance (Conyers, 2004b; Hergenrather et al., 2005, 2006). Most people who participated in Conyers's study reported they had a lack of financial resources to meet their life needs such as medical bills; therefore, their employment assisted with surviving daily life, or improving or regaining their standard of living. For those receiving public assistance, the amount it provided was not enough to cover their needs.

Regaining Positive Self-Perceptions

Many people living with HIV/AIDS have noted their experiences of regaining self-identity and a positive sense of themselves through working, earning an income, and obtaining opportunities for social interaction (Braveman & Helfrich, 2001; Braveman et al., 2003; Brooks & Klosinski, 1999; Campbell, 1998; Conyers, 2004a, 2004b; Ghaziani, 2004; Hergenrather et al., 2005, 2006; McReynolds, 2001; Timmons & Fesko, 2004; Van Gorp et al., 2007). For example, Brooks and Klosinski (1999) and Timmons and Fesko (2004) reported employment as helpful in overcoming negative feelings attached with HIV/AIDS (e.g., depression, feelings of uselessness and a burden on society, and low self-esteem) and in regaining a sense of purpose, feeling of accomplishment, and feelings of being productive. In addition, Conyers (2004a) noted that employment increased a sense of belonging, identity, and self-esteem as a standard of living and independence increased. In Conyers's study, those who returned to work or who previously had employment indicated the impact of employment on their lives included regaining hope and expectations for their future and career goals, gaining positive perceptions of themselves, becoming productive, changing their focus from their illness to positive thoughts, avoiding stigma associated with receiving of public assistance, and feeling better about their health.

Concerns and Barriers to Employment

Although many studies found high levels of interest in returning to work among people with HIV/AIDS, it appears that relatively few of those who have stopped working actually return to work (Hunt et al., 2003; Rabkin, McElhiney, Ferrando, Van Gorp, &

Lin, 2004). In connection with this finding, Martin, Brooks, Ortiz, and Veniegas (2003) identified that, in considering returning to the workforce, people who stopped working due to their HIV/AIDS diagnosis experienced greater concerns about returning to work than those who stopped work for other reasons.

Unemployed people living with HIV/AIDS have expressed concerns regarding their ability to obtain employment (Brooks & Klosinski, 1999; Conyers, 2004b; Glenn et al., 2003; Opacich, 2004). For example, Brooks and Klosinski (1999) noted concerns of those currently unemployed regarding their employability due to their lack of job experience, as well as educational backgrounds when considering employment. Those unemployed for a long period were concerned about their vocational competence since they had been out of the job market for a while (Conyers, 2004b). They were uncertain about current trends in the labor markets and their vocational skills (Conyers, 2004b). Conyers also identified that lack of necessary job skills was also a major concern of currently employed participants in maintaining their employment.

Need for Vocational Rehabilitation (VR) Services

Along with an increased desire to work and related concerns among people living with HIV/AIDS, several studies on HIV/AIDS and employment identified the need for people living with HIV/AIDS to obtain vocational rehabilitation services (Arns, Martin, & Chernoff, 2004; Brooks & Klosinski, 1999; Hergenrather et al., 2005, 2006; McReynolds, 2001; Timmons & Fesko, 2004). For example, Brooks and Klosinski (1999) addressed various employment-related services including information on openings, job referrals, interviewing skills, counseling services needed for maintaining self-esteem

and motivation, and career counseling. Other services also included resume writing, completing applications, making disclosure decisions, job training to become competent in the current labor market, and financial assistance for transportation and proper clothing (Hergenrather et al., 2005, 2006). Those individuals with a long period of absence needed help in developing strategies to answer interview questions (e.g., explaining gaps in their resume) (Glenn et al., 2003). In addition, Timmons and Fesko (2004) noted that unemployed participants needed job-seeking skills and job placement assistance to return to work, while employed individuals needed assistance in obtaining job accommodations such as flexible work schedules for medical appointments, reduced work hours, or duty changes.

Although many of the employment-related issues faced by people living with HIV/AIDS are not much different from issues people with other disabilities may experience, some issues such as the unpredictability of HIV and discrimination based upon stigma, prejudice, and fear about HIV may require unique attention (McReynolds & Garske, 2001). The combination of the nature of HIV and medication regimens raises complications and unpredictability in obtaining, maintaining, and developing careers for people living with HIV/AIDS compared to other disabilities, which may have more predictable features (Kohlenberg & Watts, 2003).

Most state vocational rehabilitation programs typically provide services to many people with a wide range of disabilities. However, VR counselors in these programs may have had relatively little experience working with people living with HIV/AIDS, and thus vocational rehabilitation counselors may not have had an opportunity to acquire

knowledge specifically related to HIV/AIDS and rehabilitation issues (Goldblum & Kohlenberg, 2005; Kohlenberg & Watts, 2003). In addition, VR services may not be well known to other AIDS-related service providers (e.g., AIDS Service Organizations), who would meet people living with HIV/AIDS more often and potentially make referrals to state vocational rehabilitation programs.

Significance of the Study

The growing number of people with HIV/AIDS who are willing to work or who are attempting to obtain employment is a new phenomenon, and rehabilitation professionals may need a better understanding of this phenomenon in order to better meet the needs of people with HIV/AIDS (Conyers, 2004b). In spite of the growing number of studies, most research became available only recently (e.g., after the year 2000) and there is a lack of quantitative research on vocational rehabilitation (VR) outcomes for people living with HIV/AIDS. Thus, relatively little is known about employment outcomes related to people living with HIV/AIDS.

Accordingly, there is a need for more research on vocational rehabilitation outcomes for people living with HIV/AIDS (Burns et al., 2006), and a need for understanding uncertain phenomena (e.g., what variables affect the employment-related outcomes of people living with HIV/AIDS?) (Conyers, 2004b). When considering that improved health does not always guarantee successfully returning to work, identifying variables that may be related to successful employment is important (Martin et al, 2004).

No research on the analyses of employment-related variables using the Rehabilitation Services Administration data file (RSA-911) for individuals living with HIV/AIDS was found at the time of this study.

Purpose of Study and Research Questions

The purpose of this study is to identify individual characteristics and vocational rehabilitation services that may be related to employment outcomes of people living with HIV/AIDS who used the state vocational rehabilitation services through the following research questions:

1. What are the socio-demographic characteristics at application, health variables, service-related variables, types of closure, and reasons for closure for participants with HIV/AIDS?
2. Are there statistically significant differences between participants with HIV/AIDS who exited the VR program with employment or without employment on socio-demographic characteristics at application and closure, health variables, and service-related variables?
3. Which variables predict an employment or unemployment outcome between participants with HIV/AIDS who exited the VR program with employment or without employment at closure?
- 4a. What are employment outcomes among participants who exited the VR program with an employment outcome?
- 4b. Do length of participation and cost of purchased services vary with number of services received?

- 4c. Are there statistically significant differences in weekly earnings based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics?

Definition of Terms

Human Immunodeficiency Virus (HIV)

HIV is a retrovirus that causes Acquired Immunodeficiency Syndrome (AIDS). There are two types of HIV virus including HIV-1 that account for most of HIV infection in the world and HIV-2, which is very rare in the U.S. but predominant in West Africa (U. S. Department of Health and Human Services: U.S. DHHS, 2005).

Acquired Immunodeficiency Syndrome (AIDS)

AIDS is a disabling or life-threatening illness caused by HIV, which impacts the body's immune system. AIDS is diagnosed when the counts of CD4 cells are below 200 cells/ μ L and/or HIV-related symptoms or disease such as infections and cancers are present (CDC, 1999; U.S. DHHS, 2005).

Socio-Demographic Variables

The RSA-911 Case Service Reporting Manual (2006) defined socio-demographic variables are as follows:

1. ***Gender***. Participants' identified gender as male or female; categorical variable.
2. ***Age at application and closure***. Participants' age at the time of application, which ranged from 18 to 69 and at closure, which ranged from 18 to 70; continuous variable.
3. ***Race/Ethnicity***. Participants' identified race/ethnicity coded as 1 = White, 2 = African American, 3 = American Indian or Alaska Native, 4 = Asian, 5 =

Native Hawaiian or Other Pacific Islander, 6 = Latino, and 7 = Multiple Races, non-Latino; categorical variable.

The RSA followed definitions of race and ethnicity recommended by the Office of Management and Budget (2000) for federal data reporting as follows:

(1) White is a person having origins in any of the original peoples of Europe, the Middle East, or North Africa; (2) Black or African American is a person having origins in any of the black racial groups of Africa; (3) American Indian or Alaska Native is a person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment; (4) Asian is a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam; (5) Native Hawaiian or Other Pacific Islander is a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands; and (6) Hispanic or Latino is a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race (Office of Management and Budget, 2000, pp. 6-7).

Note that definitions of race and ethnicities in this study depend upon definitions the RSA used. The RSA required those who indicated themselves as Latino or Hispanic to identify their race (1 through 5) as well, resulting in overlap

in numbers. To resolve the overlapping numbers, in this study, ‘Latino’ is used to denote all those who indicated themselves as Hispanic or Latino (in any race) in the RSA data file regardless of their race that they selected, and ‘Multiple Races, non-Latino’ refers to those who indicated more than one race, but not Latino.

4. ***Level of education at application and closure.*** Participants’ level of education at the time of application and closure; categorical variable.
5. ***Employment status at application and closure.*** Employment status at the time of application for all of the individuals and employment status at the time of closure for only participants who exited the program with an employment outcome; categorical variable.
6. ***Living arrangement at application.*** Participants’ temporary or permanent living arrangement at the time of application; categorical variable.
7. ***Hours worked in a week at application.*** “The number of hours a participant worked for earnings in a typical week at the time of application” (RSA-911 Case Service Reporting Manual, 2006, p. 17); continuous variable.
8. ***Weekly earnings at application.*** “The amount of money earned in a typical week at the time of application” for any given individual (RSA-911 Case Service Reporting Manual, 2006, p. 16); continuous variable.
9. ***Primary source of support at application and closure.*** An individual’s largest single source of economic support at application and closure; categorical variable.

10. ***Public benefits at application and closure.*** Participants' "receipt of cash payment made by Federal, State, and/or local governments for any reasons" (RSA-911 Case Service Reporting Manual, 2006, p. 36). Of various public supports, this study only reported two major benefits including Supplemental Security Income (SSI) and Social Security Disability Insurance at the time of application and closure; categorical variable.
11. ***Medical insurance at application and closure.*** Indication of participants' medical insurance coverage including either Medicaid or Medicare; categorical variable.

Health Variables

Health variables include and are defined, according to the RSA-911 Case Service Reporting Manual (2006), as follow:

1. ***Primary disability caused by HIV/AIDS.*** Participants' primary physical or mental impairment caused by HIV/AIDS, causing a substantial obstruction to employment (e.g., general physical debilitation and psychosocial impairments); categorical variables.
2. ***Secondary disability.*** Whether participants had secondary physical or mental impairment that may play part of the cause of obstruction to employment; categorical variables.
3. ***Cause of secondary disability.*** Participants' impairment that causes secondary disability (e.g., depressive and other mood disorders and drug abuse or dependence other than alcohol); categorical variables.

4. ***Significant disability.*** Indication of significant disability that existed at any time during the participation in the VR program. An individual with a significant disability refers to one with a physical or mental impairment that significantly limits one or more functional capacities related to an employment outcome (e.g., self-care), with the need for multiple VR services over an extended period, and with one or more physical or mental disabilities; categorical variable.

Service-Related Variables

Service-related variables include: (a) 12 rehabilitation services received, (b) source of referral, (c) cost of purchased services at closure, and (d) length of participation in the program. First, rehabilitation services received refers to services provided by state VR agencies or other providers to an individual after determining eligibility, and developing and conducting an individualized plan for employment (IEP), through funds from the state VR agency or other sources (RSA-911 Case Service Reporting Manual, 2006). According to the RSA-911 Case Service Reporting Manual (2006, pp. 22-30), the definitions of the 12 rehabilitation services and three other service-related variables are:

1. ***Assessment.*** Services provided during the process of determining eligibility and services needed for an individual, including trial work-experiences and extended evaluation.
2. ***Diagnosis and treatment of impairments.*** A variety of services provided to an individual for diagnosis and treatment of an impairment, including but not limited to corrective surgery, diagnosis and treatment for mental and

emotional disorders, dentistry, nursing services, hospitalization, drug and supplies, assistive aids, eyeglasses and visual services, podiatry, physical therapy, occupational therapy, mental health service, treatment of acute or chronic medical complications, special services for the treatment of end-stage renal disease, and many other services.

3. ***Vocational rehabilitation counseling and guidance.*** Therapeutic counseling and guidance services required specifically to obtain an employment outcome, which is different from general counseling that occurs between the counselor and the individual during the rehabilitation process. These services include personal adjustment counseling; counseling with relation to medical, family, or social issues; vocational counseling; and any other types of counseling and guidance.
4. ***College training.*** Academic training beyond high school through institutions of higher education including technical college, for the purpose of obtaining any type of higher education degree, a certificate, or other educational credential.
5. ***Occupational training.*** Occupational, vocational, or job skill training provided by a community college and/or business, or vocational training school for the purpose of employment achievement; training does not lead to an academic degree or certification.
6. ***Job readiness training.*** Training provided for the preparation of an appropriate and effective working attitude and behaviors. Exemplary services

include being at work on time with appropriate dress and grooming, appropriate work behaviors, and increasing productivity.

7. ***Job search assistance.*** Assistance in conducting a job search. Services include preparing a resume, finding job opportunities, developing interview skills, and communicating with employers.
8. ***Job placement assistance.*** A referral to a certain job for a job interview, whether or not the individual obtained the job.
9. ***On the job supports.*** Services provided to an employed individual for the purpose of job stability and job retention, including job coaching, follow-up services, and job retention services.
10. ***Transportation.*** Financial support and training provided to ensure an individual's means of travel. Examples of services include travel and related expenses for a personal care attendant or aide, relocation expenses that occur due to a job placement, the purchase and repair of vehicles, and training for public transportation use.
11. ***Maintenance.*** Financial supports provided for basic and necessary expenses with connection to participation in VR service and work, such as costs of uniforms or other proper clothing, short-term expenses (e.g., food and shelter), and initial one-time costs (e.g., security deposits for the opening of utilities).
12. ***Information and referral.*** Services provided when an individual needs services from other agencies as the services are not provided through the VR program.

13. ***Source of referral.*** Entity that first referred the individual to the state VR agency; categorical variable.
14. ***Cost of purchased services at closure.*** “The total amount of money spent by the State VR agency to purchase services for an individual” (RSA-911 Case Service Reporting Manual, 2006, p. 21). This does not include “costs for services provided by rehabilitation programs owned and operated by the State Agency that are not directly billed on an individual basis” (p. 21); continuous variable.
15. ***Length of participation in the program.*** Months calculated by subtracting date of application from the date of closure; continuous variable.

Outcome Variables

Outcome variables include and are defined, based upon the RSA-911 Case Service Reporting Manual (2006), as follows:

1. ***Type of closure.*** There are seven different types of closure including exited the program with an employment outcome and exited without an employment outcome, after receiving services; categorical variable.
2. ***Reasons for closure.*** Reasons for closing the service record of participants such as achieved employment outcome, unable to locate or contact, and failure to cooperate; categorical variable.
3. ***Employment status at closure.*** Employment status at closure among participants who exited the program with an employment outcome (i.e., employment without supports in integrated setting, self-employment,

homemaker, unpaid family worker, and employment with supports in integrated setting); categorical variable.

4. ***Hours worked in a week at closure*** “The number of hours a participant worked for earnings in a typical week when the service record was closed” (p. 35); continuous variable.
5. ***Weekly earnings at closure***. The amount of earning in “a typical after achieving an employment outcome” (p. 34); continuous variable.
6. ***Type of occupation at closure***. Occupation of participants who exited the program with an employment outcome; categorical variable.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a background for this study including: (a) an overview of the historical and general background of HIV and AIDS; (b) clinical features, diagnosis, classification, and treatment for HIV and AIDS; (c) employment and disability policy for people with HIV/AIDS; (d) an overview of the federal/state vocational rehabilitation program and potential contributors of employment outcomes; and (e) studies on issues of employment for people living with HIV/AIDS.

Historical and General Background of HIV and AIDS

Although there is evidence that AIDS cases existed before the 1980's in the U.S., the first official observations of AIDS cases in the U.S. were reported in the Morbidity and Mortality Weekly Report published in June, 1981 by the Centers for Disease Control and Prevention (CDC) (CDC, 1981, 2006). This short article reported on five young men who were homosexual and suffering from *Pneumocystis carinii* pneumonia, which is mostly caused by a deficiency of immune system functions (CDC, 1981). Since then, similar cases (including Kaposi's sarcoma and other opportunistic infections) continued to be reported, not only among those with homosexuality, but among heterosexual men, female sexual partners of bisexual males, and those who received blood transfusions (Alcamo, 2002). The number of new AIDS cases rapidly increased over the next three years, so by late 1983 the U.S. identified 3,064 AIDS cases from 44 different states (CDC, 1983).

Accordingly, researchers began to report new theories and findings related to AIDS, and by February 1985, two major research teams (an American team lead by Robert C. Gallo and a French team lead by Luc Montagnier) confirmed that viruses (type of retrovirus) found and isolated from the blood samples of people diagnosed with AIDS by each of the two teams were identical (Alcamo, 2002). A few months later, the virus was named as the human T-cell lymphotropic virus type III/Lymphadenopathy-associated virus (HTLV-III/LAV), which was the combination of two different names generated by the two different research teams (HTLV-III by the American team and LAV by the French team). This AIDS virus name was eventually changed in 1986 to human immunodeficiency virus (HIV) by an international commission composed of a number of virologists and molecular biologists (Alcamo, 2003). In addition, this virus began to be referred to as HIV-1, as Pasteur Institute scientists lead by Luc Montagnier identified another type of HIV, which began to be called HIV-2 (CDC, 1998).

Of the two different types of viruses (HIV-1 and HIV-2), HIV-1 is common and responsible for most of the cases of HIV infection in the U.S. (Glasner & Kaslow, 1990). While its mode of transmission and association with opportunistic infections and AIDS are similar with HIV-1, HIV-2 infection is known as causing slower and milder immunodeficiency (Wessner & Palladino, 2006). In addition, as HIV-2 is very rare in the U.S., but prevalent in West Africans, the CDC does not recommend HIV-2 tests in the U.S. except for a few conditions where one's risk behaviors (e.g., having unsafe sexual intercourse or sharing needles during injection drug use) involve people from the countries in which HIV-2 is common (CDC, 1998). In conclusion, finding HIV as the

cause of AIDS defined AIDS as an infectious disease and accelerated studies on the virus and treatments.

HIV is transmitted several ways, and the most common HIV transmission occurs through risk behaviors, including having sexual contact or sharing needles with someone who is infected by HIV (CDC, 2007). HIV is also transmitted from an infected mother to her baby during the birthing process or through breast feeding (CDC, 2007). The HIV transmission through blood transfusion has become very rare today as the process of identifying infected blood has become more strict (e.g., the testing of donated blood) (Wessner & Palladino, 2006). HIV infection may also occur at job sites through contact of HIV infected blood (e.g., health care setting); however, it does not commonly happen (CDC, 2007).

Clinical Features, Diagnosis and Classification, and Treatment for HIV/AIDS

Clinical Features of HIV and AIDS

The human immunodeficiency virus (HIV) is a retrovirus that profoundly deteriorates the immune system by destroying a subset of CD4 positive (CD4+) T cells (sometimes called, T-helper cells). CD4 T cells play a central role in the immune response, which is to send signals to other cells in the immune system to activate the immune system when the body is attacked by viruses (National Institute of Allergy and Infectious Disease, 2007). All retrovirus including HIV has an unusual replication cycle during which it binds to and enters a host cell, eventually becoming part of the host cell's genome, and produces new viral proteins and new copies of the viral genome (Wessner & Palladino, 2006).

Once a body is infected with HIV that leads to the destruction of CD4 T cells, the counts of the CD4 T cells drop over a period of weeks, months, or years from the typical counts of approximately 800 to 1000 CD4 cells per cubic millimeter of blood to below 200 CD4 cells (Alcamo, 2002). Although most people with HIV infection do not exhibit symptoms in early stages (Wessner & Palladino, 2006), the HIV infection eventually progresses to acquired immunodeficiency syndrome (AIDS), which is the final stage of HIV infection characterized by various symptoms of severe dysfunction of the immune system (Falvo, 1999). Three major phases of the HIV pathogenic pathway include (a) acute primary HIV infection, (b) period of asymptomatic infection, and (c) symptomatic period (AIDS diagnosis) (Alcamo, 2002; Levy, 2007). AIDS-related complex (ARC), a term that had been used to refer to a group of constitutional symptoms that lead up to AIDS, has been replaced with HIV infection, which refers to all pre-AIDS conditions (Alcamo, 2003).

In the early stage of the HIV infection, a high level of virus may be detected in the blood, and many of those infected with HIV (up to 70%) initially experience mild flulike symptoms generally within one week to four weeks after the HIV infection, (CDC, 2004). Common symptoms include fever, rash, swollen lymph nodes, muscle aches, and joint pains (Daar et al. 2001). These acute symptoms generally disappear within a week to three weeks and are not suspected by people as HIV-related symptoms, resulting in a delay of HIV infection diagnosis (CDC, 2004). Other symptoms seen in some cases include skin rash, oral candidiasis, acute central nervous system disorders, pneumonia, diarrhea,

and other gastrointestinal complaints (Alcamo, 2002). In addition, lymphadenopathy, lethargy, and malaise can last for several months (Levy, 2006).

Once symptoms of acute infection disappear, a relatively long period of asymptomatic infection ensues and may persist for a few months up to 15 to 20 years (Alcamo, 2002). During this period, HIV replication in the body continues at a low level, and generally, CD4 cell counts steadily decrease (Levy, 2006).

People infected by HIV generally develop symptoms within 10 years, along with CD4 cell counts dropping below 350 per cubic millimeter of blood and a substantially increased viral load (Levy, 2006). Symptoms that characterize this final stage, leading to AIDS diagnosis, include weight loss, diarrhea, HIV neuropathology, dementia, cancers (Kaposi's sarcoma or other HIV-related tumors), opportunistic infections (e.g., Pneumocystis carinii pneumonia), and many other diseases (Falvo, 1999). Opportunistic illnesses can develop in the lungs, gastrointestinal tract, and skin, and a delay of treatment may result in deterioration to severe disease (Alcamo, 2002).

Diagnosis and Classification of HIV Infection and AIDS

HIV infection can be detected at different stages of the infection through various procedures. Acute HIV infection (one to four weeks after HIV infection), for instance, can be diagnosed by detecting plasma virus RNA circulating in the blood within a few days after the HIV infection (Hecht et al., 2002). After a period of acute HIV infection, detection of antibodies to HIV in the blood is conducted for an HIV diagnosis using such techniques as an enzyme-linked immunosorbent assay (ELISA), which is the standard procedure for the detection of HIV antibodies (Levy, 2007). Other helpful techniques

used following the ELISA analyses for the purpose of verification of the results include examination of viral RNA levels and Western blot analyses (Fiebig et al., 2003).

The Center for Disease Control and Prevention (CDC) provide classification guidelines for HIV infection (Castro et al., 1992). This classification was last revised in 1993 and has been used to assess the severity of HIV disease based on an individual's current count of CD4 cells and medical conditions related to HIV infection, which are connected to each other (CDC, 1999). Specifically, the CDC classified HIV infection cases based on two major categories that include CD4 cell counts and three clinical categories that reflect clinical progress of HIV infection such as asymptomatic acute condition, symptomatic conditions, and AIDS-indicator conditions (Castro et al, 1992). CD4 cell counts are composed of three subcategories including: (a) greater than or equal to 500 CD4 cells / μ L, (b) between 200 and 499 CD4 cells/ μ L, (c) and less than 200 CD cells/ μ L. Regarding the three clinical categories, the CDC (Castro et al., 1992, pp. 3-4) defines each clinical category as follows:

I. Category A consists of one or more of the conditions listed below in an adolescent or adult (i.e., 13 years or older) with documented HIV infection.

Conditions listed in Categories B and C must not have occurred.

- (1) Asymptomatic HIV infection
- (2) Persistent generalized lymphadenopathy
- (3) Acute (primary) HIV infection with accompanying illness or history of acute HIV infection.

II. Category B consists of symptomatic conditions in an HIV-infected adolescent or adult that are not included among conditions listed in clinical Category C and that meet at least one of the following criteria:

- (1) The conditions are attributed to HIV infection or are indicative of a defect in cell-mediated immunity; or
- (2) The conditions are considered by physicians to have a clinical course or to require management that is complicated by HIV infection.

Examples of conditions in clinical Category B include, but are not limited to: (a) Bacillary angiomatosis; (b) Candidiasis, oropharyngeal (thrush); (c) Candidiasis, vulvovaginal that is persistent, frequent, or poorly responsive to therapy; (d)

Cervical dysplasia (moderate or severe)/cervical carcinoma in situ; (e)

Constitutional symptoms, such as fever (38.5 C) or diarrhea lasting greater than 1 month; (f) Hairy leukoplakia, oral; (g) Herpes zoster (shingles), involving at least two distinct episodes or more than one dermatome; (h) Idiopathic

thrombocytopenic purpura; (i) Listeriosis; (j) Pelvic inflammatory disease,

particularly if complicated by tubo-ovarian abscess; (k) Peripheral neuropathy

For classification purposes, Category B conditions take precedence over those in Category A. For example, someone previously treated for oral or persistent vaginal candidiasis (and who has not developed a Category C disease) but who is now asymptomatic should be classified in clinical Category B.

III. Category C includes a total of 25 clinical conditions listed in the AIDS surveillance case definition including candidiasis of bronchi, trachea, or lungs;

candidiasis, esophageal; invasive cervical cancer; and Kaposi's sarcoma. For classification purposes, once a category C condition has occurred, the person remains in category C.

In conclusion, demonstration of less than 200 CD4 cells/ μ L and/or clinical conditions that are listed under AIDS indicator results in AIDS diagnosis (Castro et al, 1992).

Treatment for HIV and AIDS

The use of antiretroviral drugs is the major treatment for HIV infection, which interrupts the replication cycle of HIV or disrupts its ability to bind with other cells (Falvo, 1999). Since the first antiretroviral drug, zidovudine (AZT, or azidothymidine), was approved for use by the U.S. Food and Drug Administration (FDA) in 1987 (Fischl et al., 1987), many more drugs have continued to be developed, resulting in a total of 31 antiretroviral drugs approved by the FDA today and classified under seven different categories (e.g., nucleoside reverse transcriptase inhibitors and protease inhibitors) (U.S. FDA, 2007).

Today, the main drug treatment for HIV infection is to administer a combination of three or more drugs, which is referred to as highly active antiretroviral therapy (HAART) (CDC, 2006). Using a combination of several drugs was first tested based on the theory that interfering with the viral replication cycle in several ways by using multiple drugs with different functions may be more effective in decreasing viral loads and reducing the resistance of HIV to a drug (Wessner & Palladino, 2006). As the combination of multiple drugs was found remarkably effective in suppressing HIV, it

became the standard HIV treatment, and has been considered a major factor in the decreased number of AIDS-related deaths and increased life span (CDC, 2007).

Opportunistic infections or other AIDS-diseases generally shown in the late stages of HIV infection are treated using drugs, appropriate therapies, and others as appropriate (e.g., use of pentamidine to treat *Pneumocystis carinii* pneumonia or chemotherapy for a cancer), while HAART is being administered for the suppression of HIV (CDC, 2007).

Employment and Disability Policy for People with HIV/AIDS

Two recent federal laws, the Americans with Disabilities Act of 1990 and the Ticket to Work Incentives Improvement Act (TWWIIA) of 1999 have been recognized as contributing to the increase of employment opportunities, options, and desire to return to work among individuals living with HIV/AIDS (Brooks et al., 2004; Conyers, Unger, & Rumrill, 2005; Razzano & Hamilton, 2005). The ADA and TWWIIA address major issues related to employment of people living with HIV/AIDS, including discrimination on the basis of fear of HIV infection (Gorenberg, 2004) and stigma attached with pathways of HIV (e.g., intravenous drug use or homosexuality), and potential benefit loss (Braveman et al., 2006; Martin et al, 2003).

The major functions of the ADA with relation to employment are to provide equal rights for employment to people with disabilities, prohibit work-related discrimination, and require employers to provide reasonable accommodations (Rubin & Roessler, 2001). Although the 1973 Rehabilitation Act played a critical role in barring employment discrimination against people with disabilities before the ADA of 1990, federal assistance was limited to physical barriers to employment; thus, discrimination based upon social

prejudice, stereotypes, and stigma were not addressed well (Maida, 2001). It was not until 1998 when the U.S. Supreme Court extended full protection to people infected with HIV, but not yet developed AIDS-related symptoms, from work-related discrimination under the ADA (Flynn, 1998; Rauber, 1998). Asymptomatic HIV infection started being considered a physical impairment from the moment of infection and covered under the definition of disability in the ADA (Rauber, 1998). This extended protection prohibits employers from making discriminative decisions about employees with HIV based on unproven fear of safety risks (Flynn, 1998).

The TWWIIA administered by the Social Security Administration (SSA) and the U. S. Department of Health and Human Services, was passed in 1999 with the purpose of expanding SSDI and SSI coverage for people with disabilities who return to work (Bruyere et al., 2002). It encourages SSDI or SSI beneficiaries, who want to work but do not work due to fear of losing their benefits to seek rehabilitation services and employment by providing a voucher they can use to obtain employment services, VR services, and other support services to work, while they still maintain their benefits (Blanck, Clay, Schmeling, Morris, & Ritchie, 2002). This legislation eliminates one of the primary barriers to employment for people living with HIV/AIDS, which is potential loss of insurance due to employment (Razzano & Hamilton, 2005). However, rehabilitation and other service providers assisting people with HIV/AIDS may still need to promote awareness of the TWWIIA (Brooks et al, 2004).

Overview of Federal/State Vocational Rehabilitation Program and Potential Contributors of Employment Outcomes

The federal/state vocational rehabilitation (VR) program was launched in 1920 with the passage of the Smith-Fess Act, which is also called the Civilian Vocational Rehabilitation Act, to provide rehabilitation services to civilian individuals with physical disabilities (Wilder & Walters, 2005). Since its establishment, the VR program has expanded over the years, characterized by the following: (a) increase of federal funding share, currently on a 80/20 basis between the Rehabilitation Services Administration (RSA) and state VR agencies; (b) extension of services to people with mental retardation and mental illness; (c) growth of the number of rehabilitation counselors; (d) emphasis on program evaluation and rehabilitation research, including vocational rehabilitation and independent living; (e) emphasis on consumers' choice, self-determination, and involvement in the rehabilitation process; and (f) expansion of services to people with the most significant disabilities (Rubin & Roessler, 2001).

Vocational Rehabilitation Process

The vocational rehabilitation process, which has the consumer's achievement of gainful employment as the primary purpose, may be initiated for an individual with a disability when he or she is referred to or applies for rehabilitation services (Wright & Martin, 1999). Once an individual submits an application to a state VR agency for VR services, his or her eligibility for the services may be determined within 60 days except for some circumstances such as when an extended evaluation is required to determine the individual's eligibility for VR services (Neighborhood Legal Services, Inc., 1999). To be

eligible for VR services, an individual must (a) have a mental, physical, or learning disability, which results in a substantial problem in obtaining employment; and (b) require VR services to prepare for, obtain, or maintain gainful employment (Neighborhood Legal Services, Inc., 1999). The VR agency determines an individual's eligibility using a variety of resources including medical reports, RSA records, education records, and other assessment results (The Texas Department of Assistive and Rehabilitative Services, 2006).

Once an individual with a disability is determined to be eligible for VR services through evaluation procedures, rehabilitation services are provided in a sequential manner including, development of an individualized plan for employment (IPE), provision and coordination of VR services, job placement, and post employment services (Rubin & Roessler, 2001). Utilizing information and resources obtained through evaluation procedures and collaborating with a rehabilitation counselor, consumers develop their own IPE, which may include employment goals, services to be provided, service providers, criteria for progress evaluation, responsibilities of each party including the VR agency, consumer, and other agencies providing services, financial needs test and costs to be responsibility of the consumer, the extended services to be needed, and expected needs for post employment services (Martin & Write, 2007). Once the consumer's IPE is developed, the individual receives agreed-upon services that are arranged and coordinated by the rehabilitation counselors to be delivered in a timely manner (Write & Martin, 1999). Services provided to VR consumers vary from services typically provided through in-house staff of rehabilitation counselors such as counseling, guidance, and job placement

to purchased services such as medical-related services, education, and training (Berkowitz & Dean, 1998). Job placement requires rehabilitation counselors to develop a job or provide assistance to consumers in developing job seeking skills and searching a job (Roessler & Rubin, 2006). Once a consumer obtains employment, rehabilitation counselors need to assure that the consumer maintains the employment outcome by providing services such as problem-solving, assistive technology services, and advocacy (Rumrill & Koch, 2001). Based upon employment outcomes, a consumer is considered as either successfully rehabilitated or not (Berkowitz & Dean, 1998). When the consumer has received services on his or her IPE, obtained employment, and retained it for a minimum of 90 days, he or she is considered as successfully rehabilitated. Employment status that may be considered as an employment outcome by the Rehabilitation Services Administration (RSA) include employment without support or with supports in integrated settings, self-employment, homemakers, and unpaid family workers (Berkowitz & Dean, 1998; RSA-911 Case Service Reporting Manual, 2006).

Given the long history of serving a large number of consumers, there have been continuous efforts to evaluate and estimate the effects of the federal/state VR program on individuals with disabilities using the VR data file, such as estimation of VR benefits based upon increase of earnings after participation in VR programs and change of employment status (Bellante, 1972; Chan, Cheing, Chan, Rosenthal, & Chronister, 2006; Conley, 1969; Rosenthal, Dalton, & Gervery, 2007). These estimations have been undertaken based on data quantified and available for data analyses such as demographics,

earnings, and services received. Nevertheless, there may be many other components that contribute to employment outcomes and need to be taken into account as well.

Potential Contributors of Employment Outcomes

People with disabilities may or may not seek assistance and receive vocational rehabilitation services when they contemplate or attempt to return to the workforce. Thus, their attempts not always guarantee or lead to successful job placement and maintenance, due to various factors that may not be simply explained because of its complexity. Hence, when discussing employment outcomes of people with disabilities, potential factors including both environmental (e.g., physical, social, and attitudinal environment) and individual factors may need to be recognized.

Societal Values and Responses

In spite of improved understanding of people with disabilities in today's society, societal values and responses toward people with disabilities historically embedded in society are yet being discussed as obstacles in securing and maintaining employment of people with disabilities (Berry & Hunt, 2005; Roessler, Neath, & McMahon, 2007). For instance, a unique stigma attached to HIV/AIDS, which may cause discrimination is that people with HIV/AIDS are thought of as homosexual or a drug user (Herek, Capitanio & Widaman, 2002). Such perceived causes of disability has been known as influencing responses and attitudes toward people with disabilities (e.g., prejudicial attitudes from employers and co-workers) and eventually undermining social involvement and employment of people with disabilities (Corrigan, Larson, & Kuwabara, 2007; Stuart, 2006).

Discrimination at Workplace

Although the ADA prohibits discrimination on the basis of disability and requires reasonable accommodations at work, discrimination issues have still been reported as hindering many people with disabilities from entering the competitive labor market (Conyers, Boomer, & McMahon, 2005). It is also noteworthy that there may be variance in legal protection from discrimination because state laws vary and not all state laws specify requirements mandated by the ADA (e.g., the type of accommodations, limited requirements of providing reasonable accommodations to only public sector employees, exclusion of alcoholism or drug abuse from coverage) (Lee & Thompson, 1998). These differences might impact on different outcomes of VR services provided by different state agencies.

Rehabilitation Professionals

Rehabilitation professionals play critical and comprehensive roles in the overall VR process including counseling, planning and coordinating services, case management, vocational assessment, and job development and placement services (Leahy, Chan, & Saunders, 2003; Remley, 1993). As important as the roles of rehabilitation counselors in the VR progress, their knowledge and competency are known as closely related to positive effects of rehabilitation services because they may increase the employment options and success for individuals with disabilities (Bellini, 2002; Leahy et al., 2003; McCathy, Pelletier, & Accordino, 2005; Noll, Owens, Smith, & Schwanke, 2006). Likewise, rehabilitation counselors' own values and beliefs about disabilities, characteristics of individuals with disabilities, and diversity issues may impact on the counselors' attitudes

toward their consumers, judgment, and expectations for consumers' potential to be employed (Capella, 2002; Chung & Bemak, 2002; Olney & Kennedy, 2002; Richardson & Moninaro, 1996; Rosenthal, 2004; Rosenthal & Berven, 1999; Saunders, Barros-Bailey, & Rudman, 2007; Wilson, Alston, Harley, & Mitchell, 2002).

Individual Characteristics

An individual with a disability is the center point in the vocational rehabilitation process, and a range of individual characteristics may influence the individual's employment outcome. These individual characteristics may include socio-demographics such as age, gender, race/ethnicity, and education. However, individual differences may be found in broader contexts including different degrees of physical and mental health functioning, personality, personal values, motivation, degrees of perceived needs for VR services and employment, family relationships and supports, and perceptions of their own health and previous experiences (e.g., different degree of fears of disease progression and discrimination at work). Because participation in the VR program is voluntary, degrees of perceived needs for a job and VR services for personal and financial reasons may cause variation in outputs of VR services (Bautista & Wludyka, 2007). Thus, any personal situations that an individual may deal with while they endeavor to obtain and retain employment may impact on his or her employment outcome.

Studies on Issues of Employment for People Living with HIV/AIDS

Search Strategies & Selection Criteria

Studies were identified through computerized searches of MEDLINE, PsychINFO, Eric, Academic Search Premier Publications, and Dissertation Abstracts International.

The search terms included *HIV and AIDS* in combination with the following terms employ*, vocation*, work*, job, rehab*, career, counseling, and psychosocial rehabilitation (* was used to search all possible titles that begin with the word). In order to capture all pertinent literature, the references of each of the acquired articles and literature reviews related to HIV/AIDS and employment were also scanned. This review only included research published in peer-reviewed journals and dissertations in English, but there was no limitation on the year of publication (up to August 2007). To be included in the review, a study must have presented the following information: (a) primary participants with HIV/AIDS, (b) study goals to investigate employment-related outcomes, and (c) analyses of variables related to employment.

Considering that each country has a different culture and environment in which perceptions of HIV/AIDS and the degree of expectations and support are unique, studies conducted out of the United States were excluded from this review. Also, studies that did not specifically address employment outcomes were excluded (e.g., relationships between functional capacity and mental health).

As a result of the search, a total of 19 studies in peer reviewed journals and two dissertations met the aforementioned criteria, and therefore were selected. Table 1 illustrates the demographic characteristics of the participants in the included studies, which were listed in chronological order and alphabetical order when more than one study was published in the same year. However, follow-up studies were listed after the preceding study (Martin, Arns, Batterham, Afifi, & Steckart, 2006; Razzano, Hamilton,

& Perloff, 2006). Appendix A contains the number of participants, participants' mean age, ethnicity, gender, diagnosis, education, and employment status for each study.

Research Designs Employed across the Studies

The majority of the 21 studies were non-experimental, quantitative research in which researchers identified variables related to employment outcomes and investigated relationships among variables without manipulating them (Ary, Jacobs, & Razavieh, 2002; Bellini & Rumrill, 1999; Trochim, 2001). Specifically, 18 studies employed a correlational design to investigate significance of group differences, to predict group membership, or examine degree of relationship among variables (Ary et al., 2002; Bolton, 1974).

The remaining three studies include: (a) one study using a quasi-experimental design that investigated the effects of vocational rehabilitation interventions compared to a comparison group with no random assignment of the participants (Martin et al., 2006), (b) a survey study (Yelin et al., 1991) that employed closed-ended telephone interviews to investigate the impact of HIV-related illness on employment, and (c) a program evaluation using various data resources such as interview and documentary evidence (e.g., assessment results and employment status after program participation (Kielhofner et al., 2004).

Demographic Characteristics of Study Participants

Some commonalities and differences were found across the 21 selected studies. The overall number of participants varied with a minimum number of 54 and a maximum

number of 2,864. The mean age of participants appeared to be relatively young as age ranged from the 30's to early 40's (from a mean age of 33.3 to 44.8).

With regard to proportions of race/ethnic groups, most of the studies included a relatively higher number of Caucasians compared to other race/ethnicity groups. Note that the 21 studies in this review used one of the following terms race, ethnicity, or race/ethnicity to report participants' race or ethnicity. However, none of the studies provided definitions of those terms. Of the 21 studies, only six studies involved more African American participants than those in other ethnic groups including Caucasian (Blalock, McDaniel, & Farber, 2002; Conover, Arno, Weaver, Ang, & Ettner, 2006; Jefferson, 2007; Kielhofner et al., 2004; Razzano & Hamilton, 2005; Razzano et al., 2006; Van Gorp et al., 2007). Only one study (Burns et al., 2006) involved a relatively higher number of Latinos than any other ethnic group, and Burns et al. (2007) had only Latinos as participants.

Most studies predominantly included males with four studies with only male participants (Darko, McCutchan, Kripke, Gillin, & Golshan, 1992; Heaton et al., 1994; Rabkin et al., 2004; Van Gorp, Baerwald, Ferrando, McElhiney, & Rabkin, 1999). Furthermore, five studies included females that accounted for 10% or less than 10% of the total number of participants in the study (Burns et al., 2006; Leigh et al., 1995; Martin et al., 2006; Massagli et al., 1994; Yelin, Greenblatt, Hollander, & McMaster, 1991). The only studies that contained more female participants than males were Conover et al.'s (2006) study (males 42%, females 58% of N = 1,138) and Jefferson's (2007) study

(males 46%, females 54% of N = 100). In terms of diagnosis, most studies had both participants who were HIV positive and those with an AIDS diagnosis.

Education levels of participants ranged from less than a high school education to a graduate school level of education; however, a relatively higher number of participants across the studies reported having some college in addition to a high school diploma.

Employment status of the participants was reported as either employed or unemployed in the 21 studies, although some studies specified their participants' employment as either part-time or full-time employment. All but two studies (Burns et al., 2007; Twamley et al., 2006) included higher numbers of unemployed participants than employed participants.

Introduction of Studies Reviewed

In this section, the purpose of study, backgrounds, and data analyses of the 21 reviewed studies are briefly presented in chronological and alphabetical order to present findings across the studies, which follows in the next section.

Yelin, Greenblatt, Hollander, and McMaster (1991). The Impact of HIV-related Illness on Employment

To investigate effects of HIV-related illness on employment loss, Yelin and colleagues (1999) conducted three structured telephone interviews over a year with a total of 193 people with HIV-related illness symptoms. Participants were receiving medical care through the AIDS Clinic at the University of California at San Francisco (UCSF). While attending the clinic, participants provided an update on health status, medical care usage, and employment history.

Symptoms of HIV-related illness experienced by participants included neurological symptoms (60% of participants), symptoms of dementia (less than 33% of participants), and physically limiting symptoms (slightly less than 50% of participants). The authors reported decreased employment rates of the participants from 86% (n = 166, 38 hours a week on average) when HIV-related symptoms were first noticed to 46% in the last interview conducted (n = 77, 34 hours a week on average), demonstrating an overall decrease of 54% in employment rates after an average of 958 days from when symptoms were first noticed. The rapidity of employment loss was faster among those with AIDS, followed by those with AIDS - related complex (ARC), and those with asymptomatic HIV. Estimating the probability of participants' withdrawal from work based on demographic, medical, and work-related variables was conducted using a Cox proportional hazards regression model.

Dako, McCutchan, Kripke, Gillin, and Golshan (1992). Fatigue, Sleep Disturbance, Disability, and Indices of Progression of HIV Infection

To test the effects of fatigue on activities and employment of homosexual males living with HIV/AIDS, Dako et al. (1992) conducted group comparisons among those with AIDS-related Complex (ARC) or AIDS (n = 14), those without HIV-related symptoms except for lymphadenopathy (n = 44), and a comparison group without HIV infection (n = 50). The authors examined participants' fatigue, sleepiness, and sleep habits using the questionnaire that they developed, and obtained medical indices (e.g., CD4 cell count and hematocrit) through blood measure. Group comparisons were

conducted using chi-square analyses and ANOVAs, and a discriminate analysis was performed to examine prediction of group membership (employed vs. unemployed).

Heaton, Velin, McCutchan, Gulevich, Atkinson, Wallace, Godfrey, Kirson, Grant, and the San Diego HIV Neurobehavioral Research Center (1994). Neuropsychological Impairment in Human Immunodeficiency Virus-Infection: Implications for Employment

Heaton and colleagues (1994) examined the relationship between neuropsychological impairment and employment status by comparing a group of 289 individuals with HIV infection (252 participants in the asymptomatic or early symptomatic stage and 37 in the later symptomatic stage) to a control group of 89 individuals with HIV seronegative. For the purpose of this analysis, the authors utilized the data from a longitudinal study of the neurobehavioral effects of HIV conducted by the San Diego HIV Neurobehavioral Research Center. All participants received medical, psychiatric, neuropsychological, neuroradiological, and neurological evaluations, and completed a brief employment questionnaire.

Participants in the asymptomatic or early symptomatic stage were slightly younger (mean age: 31.2) than those without HIV (mean age: 34.2) or in the later symptomatic stage (mean age: 34.7). Proportion of non-White participants was also higher in the asymptomatic or early symptomatic group (24.6%) than the other two groups (14.6% in the control group without HIV and 8.1% in the later symptomatic group). The control group with HIV had the highest number of CD 4 cell counts (856.7) followed by those in the asymptomatic or early symptomatic stage (476.7) and those in

the later symptomatic stage (175.4). Employment rates among these participants in relation to neurocognitive impairment were examined using a chi-square analysis.

Massagli, Weissman, Seage, and Epstein (1994). Correlates of Employment after AIDS Diagnosis in the Boston Health Study

In the Boston Health study, Massagli et al. (1994) examined the time to employment loss after AIDS diagnosis, the relationship between employment loss and the characteristics of the participant and their job, as well as earnings and working hours. The authors first conducted baseline interviews with a total of 305 people with AIDS, who were receiving medical care from three different medical sites in Boston, and follow-up interviews four months later. The participants had been diagnosed with AIDS for 16 months on average prior to their participation in the study. The percentage of participants employed decreased from 76% at diagnosis to 53% at baseline interviews. Thus, 23% of those participants who reported working at diagnosis reported losing their job a month after diagnosis.

The authors examined participants' employment status at AIDS diagnosis based on individual characteristics using chi-square analyses, independent t-tests, and ANOVAs. Estimation of proportional hazards of employment loss in relation to individual characteristics and job-related variables (job types and mental and physical efforts required at work) was conducted using a Cox proportional hazards model.

Leigh, Lubeck, Farnham, and Fries (1995). Hours at Work and Employment Status among HIV-Infected Patients

Leigh et al. (1995) examined work hours and employment patterns of a total of 1,263 patients who participated in a longitudinal study related to HIV/AIDS called the AIDS Time Oriented Health Outcome Study (ATHOS). For the purpose of the study, the authors compared two groups of individuals, one with HIV (n = 508) and one with AIDS (n = 359), to a comparison group of people who tested HIV negative (n = 396).

The least number of working hours (38.36 hours) and lowest employment rates (48%) was shown in the group of people with AIDS, followed by the group of people who were not yet diagnosed with AIDS (working hours: 40.71 and employment rate 83%). The comparison group of individuals, who tested HIV negative, demonstrated higher education levels and more stable marital status.

Using Statistical Applications Software (SAS), the authors examined the probability of employment and working hours among employment participants using a probit regression and a least squares regression, respectively.

Van Gorp, Baerwald, Ferrando, McElhiney, and Rabkin (1999). The Relationships between Employment and Neuropsychological Impairment in HIV Infection

Van Gorp and colleagues (1999) investigated the relationship of neuropsychological functions to employment status with a total of 130 individuals with HIV/AIDS, who were enrolled in a longitudinal natural history study. Participants were administered a number of neuropsychological test batteries such as the California Verbal Learning Test-CVLT and the Trail Making Test A and B, which examined cognitive

function, attention, and working memory. In addition, the authors reviewed participants' employment status and divided them into an employed group (n = 66) or an unemployed group (n = 64). Other information of participants obtained included CD4 cell count and viral load, level of fatigue, physical limitations (questionnaire), and a self-reported measure of depression (the Beck Depression Inventory). Once the authors investigated group differences between employed and unemployed participants on demographic, psychological, and medical variables using chi-square analyses, they conducted logistic regression (using forward and enter methods) to examine predictors of group members (employed vs. unemployed).

Blalock, McDaniel, and Farber (2002). Effects of Employment on Quality of Life and Psychological Functioning in Patients with HIV/AIDS

To investigate effects of employment on quality of life and psychological functioning for people with HIV/AIDS, Blalock et al. (2002) recruited a total of 200 individuals from an urban HIV/AIDS outpatient clinic where comprehensive medical services were provided. For the purpose of the study, the authors conducted an assessment including an employment and medical history questionnaire, a health status questionnaire, and a psychopathological symptom inventory.

Of the 200 participants, 60% (n = 120) were unemployed, whereas 40% (n = 80) were employed. Of the 80 employed participants, 38% (n = 30) were working full time and the remaining participants were working part-time. The average monthly income among the employed participants was \$1,936.00, whereas the average monthly income for unemployed participants was \$608.00

Multivariate analysis of covariance was conducted to investigate the impact of employment status on perceived quality of life using viral load and CD4 cell counts as covariates. A between-group-analysis was also conducted to examine group differences on perceived quality of life and psychological functioning.

Kielhofner, Braveman, Finlason, Paul-Ward, Goldbaum, and Goldstein (2004).

Outcomes of a Vocational Program for Persons with AIDS

In a vocational rehabilitation intervention study using a single group design, Kielhofner and colleagues (2004) developed the Employment Options Program consisting of a variety of vocational rehabilitation interventions that were provided in four different phases. The authors provided this program with a total of 129 people with AIDS, recruited from various agencies providing services to people with AIDS who desired to obtain employment. Each of the four phases offered different types and levels of services (e.g., assessment and alteration of vocational selection in phase one, and opportunities for volunteer work or temporary work experience to obtain productive roles in phase two). The participants received the services in a flexible manner in which they could move back and forth from one phase to another phase as needed, and stay in a phase for a different length of time.

Kielhofner et al. (2004) reported the outcomes of the interventions, including the rate of program completion and successful outcomes among those who completed the program, as well as participant characteristics that predicted successful program outcomes. Of a total of 129 initial participants, 90 participants (70%) completed the program among which 60 participants (67%) obtained successful outcomes, including

employment (n = 50), returning to school (n = 2), and a volunteer position or internship (n = 8).

The authors conducted chi-square analyses and independent t-tests to examine differences in intervention outcomes (successful vs. unsuccessful) based on individual characteristics (e.g., age, gender, and mental health history) and binary logistic regression to predict group membership (successful vs. unsuccessful).

Martin, Arns, Chernoff, and Steckart (2004). Working with HIV/AIDS: Who Attempts Workforce Reentry Following Disability?

Funded by the Health Resources and Services Administration (HRSA), Martin and colleagues (2004) provided assistance to a total of 235 people with HIV/AIDS in returning to work from 1997 to 2001, monitored their progress, and evaluated the effectiveness of the program. As part of this project, the authors compared demographic and health-related information of the program participants, collected at the baseline interviews, with those of a comparison group consisting of 51 people with HIV/AIDS who were not looking for employment-related assistance.

The authors conducted chi-square analyses (Fisher's Exact test was used when the frequency of observation per cell was less than 5) or t-tests to examine group differences (intervention vs. comparison) in relation to (a) demographics; (b) income and income source; (c) current employment status based on previous employment, reasons for not working, and job-related activities (job training in the past 6 months and training classes for job); (d) health-related indices (CD4 cell count, viral load, opportunistic infection history, and functional impairment using Karnofsky Performance Scale Index); (e) results

of the SF-36 that was used to examine eight areas of health-related quality of life (physical functioning and physical role, bodily pain, general health, vitality, social function, emotional role, and mental health); (f) HIV-related symptoms (e.g., forgetting things, fever, and night sweats); and (g) alcohol and drug abuse.

Martin, Arns, Batterham, Afifi, and Steckart (2006). Workforce Reentry for People with HIV/AIDS: Intervention Effects and Predictors of Success

Martin et al. (2006) conducted follow-up analyses of Martin et al.'s (2004) study on predictors of successful completion of the program and time to employment from the baseline assessment. For the purpose of these analyses, the authors excluded some program participants, who did not complete the follow-up interview and who remained in employment throughout the follow-up stage, resulting in a total of 126 participants in the analyses (98 participants in the intervention group and 38 in the comparison group). The authors conducted survival analysis of returning to work (survival was defined as the length of time being unemployed while in the program) using predictor variables selected via the PROC PHREG procedure in SAS V8.1 and time to return to work as an outcome variable.

Rabkin, Martin, McElhiney, Ferrando, Van Gorp, and Lin (2004). Predictors of Employment of Men with HIV/AIDS: A Longitudinal Study

Rabkin and colleagues (2004) investigated predictors of employment status and working hours of 141 homosexual males among those who participated in a study that investigated adjustment to symptomatic HIV and AIDS. For the study, the authors obtained information through interviews or tests at six different time points over a period

of three years and 6 months. Of the 141 participants, 19 obtained either part-time or full-time employment during the study period, and the major reason for obtaining employment was an opportunity to work or from their financial need. Several multiple regression analyses were conducted to investigate predictors of working hours.

Bernell and Shinogle (2005). The Relationship between HAART Use and Employment for HIV- Positive Individuals: An Empirical Analysis and Policy Outlook

Bernell and Shinogle (2005) examined the effects of highly active antiretroviral therapy (HAART) use and personal characteristics on employment status of a total of 2,864 individuals living with HIV/AIDS, using survey data collected from a number of clinics, hospitals, and private practices by the HIV Cost and Services Utilization Study (HCSUS). The authors investigated differences between the employed and unemployed groups on personal characteristics and conducted a bivariate probit analysis to examine predictor variables in relation to likelihood of employment.

Razzano and Hamilton (2005). Health-Related Barriers to Employment among People with HIV/AIDS

At the University of Illinois at Chicago, through the Medication Adherence Program Study (UIC MAPS), Razzano and Hamilton (2005) investigated the relationships between demographic and HIV/AIDS-related illness and employment status, as well as differences in benefits and entitlements between unemployed individuals and employed individuals. A total of 63 people with HIV/AIDS, receiving case management services (e.g., supported living and independent living) through a local AIDS service organization called Chicago House, participated in the study. Following completion of

baseline interviews, the participants were randomly assigned to either the MAPS intervention or the comparison group, who received the usual services at Chicago House.

Differences in the proportion of employed and unemployed participants based on individual characteristics (e.g., gender, ethnicity, education, mode of HIV transmission, beneficiary status, CD4 cell count, and viral load) were examined using chi-square analyses. In addition, the authors examined, using an analysis of variance, variability of perceptions of physical and mental health, well-being, functioning, and quality of life related to employment status by conducting the Medical Outcomes Study HIV Health Survey (MOS-HIV).

Razzano, Hamilton, and Perloff (2006). Work Status, Benefits, and Financial Resources among People with HIV/AIDS

Razzano et al. (2006) conducted a follow-up study with a larger number of MAPS participants (N = 98) in the same setting (Chicago House). Of a total of 98 participants, 70 participants were unemployed and 28 participants were employed at baseline. At the six month follow-up, 72 of 98 participants were unemployed and 26 individuals were employed. For clarification, there were a total of 70 males and 28 females (including 3 male to female transgendered individuals).

Beneficiary status between the two groups was also found to be similar with the findings from the previous study (Razzano et al., 2006) as there were significantly higher rates of Medicaid coverage among unemployed participants (48 of 70 unemployed individuals at baseline and 48 individuals of 72 at follow-up), compared to employed participants (7 of 28 employed participants at baseline and 11 of 26 employed

participants at follow-up). In contrast to the prior study, significantly higher rates of receipt of private insurance appeared among participants who were working at follow-up (7 of 26 employed participants) compared to unemployed participants (6 of 72 unemployed participants).

Gender differences on receipt of benefits were also shown on Medicaid (21 of 28 females and 34 of 70 males at baseline) and private insurance (none of females and 11 of 70 males at baseline). Gender comparisons on amounts of monthly income also showed differences on SSDI, SSI, other social or public entitlements, and total monthly personal income. Specifically, males received significantly higher amounts of SSDI (\$434.00 at baseline and \$433.00 at follow-up) than females (\$285.00 at baseline and \$239.00 at follow-up), and had significantly higher monthly personal income at follow-up (\$1,094.00) compared to females (\$778.00).

Burns, Young, and Maniss (2006). Predictors of Employment and Disability among People Living with HIV/AIDS

Burns et al. (2006) examined factors related to employment and disability status of a total of 127 patients with HIV/AIDS at a large immunosuppression clinic in the southwestern United States. The authors found differences on employment and disability status across different racial groups. Specifically, employment rates for African Americans (n = 16), Latinos (n = 72), and Caucasians (n = 39) were 50%, 57%, and 31%, respectively. A hierarchical logistic regression analysis was conducted by entering the following variables in four steps: (a) race and time since diagnosis, (b) age, (c) CD4 cell and viral load, and (d) mental health functioning and physical functioning.

Conover, Arno, Weaver, Ang, and Ettner (2006). Income and Employment of People Living with Combined HIV/AIDS, Chronic Mental Illness, and Substance Abuse Disorders

Using baseline interviews, Conover and colleagues (2006) investigated income resources and variables related to receiving public supports, and employment probability for individuals with HIV/AIDS; as well as, co-occurring chronic mental illness and substance abuse disorders (N = 1,138).

The lowest average monthly incomes were found among African Americans (\$573.00), those with less than high school education (\$568.00), and those without a stable residence (\$535.00). The highest incomes were for those with 4-years of college or more (\$1,171.00), followed by those employed (\$987.00, a mean income calculated from all employed participants), those older than 50 (\$851.00), and Caucasians (\$861.00).

In regard to employment status, the employment rates of 1,138 participants were less than 14%, and the major reasons for unemployment included permanent disability (more than 33.3%) and physical health issues (53%). In relation to predictors of employment status, multivariate analyses found a relatively lower likelihood of employment among females, those with more physical health issues, and those with moderate physical health issues. Individuals with a higher probability of employment were those experiencing a major depressive episode and those with fewer psychiatric symptoms. The reason for the higher probability of employment among individuals who experienced a major depressive episode was because other individuals had relatively worse mental health problems than a major depressive episode.

Henninger (2006). Ecological Validity of Neuropsychological Assessment: The Roles of Vocational Assessment and Employment in Aging HIV+ adults

Using a variety of standardized tests for neuropsychological evaluation, Henninger (2006) investigated relationships among neuropsychological performance, vocational performance, and other individuals characteristics (e.g., age, education, ethnicity, and employment) for individuals whose age was equal to or under 35 (n = 73) and individuals whose age was equal to or above 50 (n = 38). No difference on employment status was found between the younger and older group.

Twamley, Narvaez, Sadek, Jeste, Grant, and Heaton (2006). Work-Related Abilities in Schizophrenia and HIV Infection

Twamley et al. (2006) compared work-related abilities as measured by a standardized vocational assessment with a variety of work-related ability domains measured by computerized assessment (COMPASS), across three groups including, 27 individuals with schizophrenia, 27 unemployed individuals with HIV, and 27 employed individuals with HIV. Participants with schizophrenia and those with HIV were drawn from a randomized controlled study of vocational rehabilitation programs and a longitudinal study of individuals with neuropsychological and functional impairments, respectively. Group comparisons were conducted using chi-square analysis and one-way analysis of variance as well as analysis of covariance (ANCOVA).

Burns, Young, and Maniss (2007). Factors Associated with Employment among Latinos Living with HIV/AIDS

Burns et al. (2007) explored predictors of employment among 72 Latinos living with HIV/AIDS, including demographic, health-related, and psychological variables. For the purpose of the study, the authors recruited participants from those waiting for medical examination results at a HIV/AIDS treatment clinic in the Southwest United States. Chi-square analyses and ANOVAs were conducted to investigate group differences (employed vs. unemployed) based on various individuals characteristics including demographic characteristics, CD4 cell count and viral load, physical and mental health, perceived control over health outcomes, and acculturation. Backward binary logistic regression was conducted for prediction of employment status.

Jefferson (2007). Predictors of Employment Outcomes for African Americans with Human Immunodeficiency Virus vs. Spinal Cord Injury

Jefferson (2007) investigated relationships of social support, job search self-efficacy, acceptance of disability, and depression with employment outcomes among African Americans living with HIV (n = 100) and spinal cord injury (n = 80). Logistic regression and multiple regression analyses were conducted to predict employment and job satisfaction, respectively.

Van Gorp, Rabkin, Ferrando, Mintz, Ryan, Borkowski, and McElhiney (2007). Neuropsychiatric Predictors of Return to Work in HIV/AIDS

Van Gorp and colleagues (2007) conducted a longitudinal (two-year study) to investigate the relation of neurocognitive, medical, and psychiatric measures in obtaining

and remaining in employment among people living with HIV/AIDS (N = 118), who had at least 12 month-full-time employment and had a willingness to work. Participants were recruited from various sources including a government-funded vocational rehabilitation program, flyers, advertisements, and personal contacts. During the two- year study period, 52% of the total participants obtained some type of employment of whom 40% obtained paid employment, maintained a job at least one week, and 15% remained in employment. The authors conducted chi-square analyses or independent t-tests to investigate significance of group differences between employed and unemployed participants and a Cox Survival regression to examine predictors of findings work.

Findings across the Studies Reviewed

The 21 studies included in the review demonstrated findings on the relationships of a number of variables with relation to employment of individuals with HIV/AIDS using different statistical analyses. The findings varied across studies based upon different types of data analyses. This summary organized the variables reported across the 21 studies and their relationships with employment status, employment loss, or employment changes in three categories: (a) significance of group differences, (b) degree of relationship among variables, and (c) prediction of group membership.

First, significance of group differences between employed and unemployed individuals were found across the studies using chi-square analysis, independent t -test, one-way analysis of variance (ANOVA), one-way analysis of covariance (ANCOVA), or one-way multivariate analysis of variance (MANOVA). The findings on group differences were reported using the following categories of variables: (a) socio-

demographic variables, (b) medical or functional variables, and (c) emotional or mental health-related variables.

Investigation for degree of relationship among variables included bivariate correlation and regression and multiple regression. Analyses of prediction of group membership included discriminant analysis or logistic regression. While findings on group differences were reported for each variable, findings on multivariate analyses were reported for the model resulting from the analyses.

Significance of Group Differences

Socio- demographic variables. Of the three categories under which findings of group differences were reported, socio-demographic variables consisted of age, race/ethnicity, gender, education, sexuality, marital status, living arrangement, public benefits and insurance coverage, employment status, occupation, hours worked, duration of unemployment, income, mode of HIV infection, current living situation, incarceration history, using English as first language, years in the U.S., and acculturation (see Appendix B).

Findings on group differences based upon age varied. Chi-square analyses found no significant differences based upon age between employed individuals and unemployed individuals (Henninger, 2006; Yelin et al., 1991). Bernell & Shinogle (2005) also did not find age differences between the two groups among individuals younger than age 50; however, White individuals aged above 50 were more likely to be unemployed. In independent t-tests, age was not found to be significantly different between individuals with a job and individuals without a job at AIDS diagnosis (Massagli et al., 1994).

Similarly, Martin et al. (2004, 2006) and Burns et al. (2006) did not find age differences between individuals seeking employment and those not seeking employment. However, Van Gorp et al. (1999, 2007) and Twamley et al. (2006) found that unemployed individuals were significantly older than employed individuals. Analysis of variance also found that unemployed individuals were significantly older than employed individuals (Burns et al., 2007).

Regarding race/ethnicity, most studies did not find significant differences of race or ethnicity between employed and unemployed individuals (Blalock et al., 2002; Razzano & Hamilton, 2005; Razzano et al., 2006; Twamley et al., 2006; Van Gorp et al., 1999; Van Gorp et al., 2007; Yelin et al., 1991). Also, Martin et al. (2004) did not find race differences between individuals seeking employment and not seeking employment. However, a follow-up study (Martin et al., 2006) found that individuals not seeking employment were more likely to be African American. In Bernell & Shinogle (2005)'s study, employed individuals were more likely to be White. In contrast, in Burns et al. (2006)'s study, White and African American individuals were more likely to be on disability, whereas Latinos were more likely to be employed.

Several studies found no significant gender differences between employed individuals and unemployed individuals (Blalock et al., 2002; Burns et al., 2006, 2007; Razzano & Hamilton, 2005; Van Gorp et al., 2007). Similarly, Martin et al. (2004, 2006) did not find gender differences between individuals seeking employment and those not seeking employment. On the other hand, comparisons between individuals with a job and individuals without a job at AIDS diagnosis showed significantly higher rates of

unemployment among females (Massagli et al., 1994). Likewise, significantly higher rates of employment appeared among males at both baseline (60 males and 4 females) and six-month follow-up in the Razzano et al. (2006) study (62 males and 3 females).

Education differentiated between employed and unemployed individuals in some studies, but not in other studies. In Massagli et al. (1994) study, unemployed individuals showed significantly lower education than employed individuals. Bernell & Shinogle (2005) also found that employed individuals were more likely to have some college education, whereas unemployed individuals were more likely to have less than a high school degree than employed individuals. In contrast, other studies found no significant differences based upon education between employed and unemployed individuals (Burns et al., 2006, 2007; Razzano and Hamilton, 2005; Razzano et al., 2006; Van Gorp et al., 1999). Similarly, Martin et al. (2004, 2006) did not find differences in education between individuals seeking employment and not seeking employment. Two studies that conducted t-tests using mean years of education found no significant difference between employed individuals and unemployed individuals (Twamley et al., 2006; Van Gorp et al., 2007).

Of four studies that reported on sexuality, two studies indicated that whether being homosexual was not significantly related to employment status (Yelin et al., 1991; Van Gorp et al., 2007). However, two studies found that individuals who were seeking employment were more likely to be homosexual than those not seeking employment (Martin et al., 2004, 2006).

Regarding marital status, Burn et al. (2006, 2007) found no significant relationship between marital status and employment status. Similarly, in the study by Martin et al. (2006), marital status did not differentiate between individuals seeking employment and individuals not seeking employment. However, Martin et al. (2004) found that individuals who were seeking employment were more likely to be married than individuals not seeking employment.

Several studies reported on public benefits or insurance coverage. Van Gorp et al. (2007) found no difference between employed and unemployed individuals in relation to SSI and SSD. In Martin et al.'s (2004) study, no group difference was found between individuals seeking employment and those not seeking employment in SSI, although individuals seeking employment were more likely to receive SSDI than those not seeking employment (40.4% vs. 19.6%).

In relation to insurance status, Bernell and Shinogle (2005) reported significantly higher percentages of receiving Medicaid and Medicare among unemployed individuals (43% and 28% of $n = 1,849$, respectively) compared to employed individuals (7% and 4% of $n = 1,015$, respectively). Razzano and Hamilton (2005) also found receipt of Medicaid to be significantly higher among unemployed individuals (73% of 44 unemployed participants), than among those who were employed (26% of 19 employed participants), but not other types of benefits including Medicare and mental health care. Similarly, Razzano et al. (2006) found unemployed individuals were more likely to have Medicaid, whereas employed individuals were more likely to have private insurance. In

addition, females were more likely to have Medicaid and less likely to hold private insurance than males.

Regarding previous employment status and working hours, no significant differences were found between individuals seeking employment and those not seeking employment in relation to employment status in the past month and reasons for unemployment occupation prior to HIV diagnosis in Martin et al.'s (2004) study and whether they had a paid job in the month before the baseline interviews, and number of working hours before their study participation in Martin et al.'s (2006). However, individuals seeking employment were more likely to obtain employment and spent fewer days to get a job compared to individuals not seeking employment (Martin et al., 2006).

In terms of the nature of work, Massagli et al. (1994) reported findings from analysis of variance that individuals whose job required higher physical efforts were more likely to experience employment loss, whereas individuals whose job required higher mental efforts were more likely to maintain employment. Thus, individuals with a professional job were more likely to maintain their employment than those with service and unskilled labor (Massagli et al., 1994).

Regarding duration of unemployment, Twamley et al. (2006) found that unemployed individuals with HIV were more likely to have longer mean years of unemployment since their last job compared to employed individuals with HIV. Likewise, in Van Gorp et al. (2007), employed individuals had less duration of unemployment than unemployed individuals before they entered the study.

In relation to income, no significant group differences were found, from chi-square analyses, between employed and unemployed individuals based on annual household income (Burns et al., 2006, 2007). Similarly, independent t-tests found no significant differences between individuals seeking employment and those not seeking employment in current total income (Martin et al., 2004) and total income for a month before the baseline interviews (Martin et al., 2006). However, individuals seeking employment earned significantly higher amounts of income from employment prior to the baseline interviews and were more likely to earn higher amounts of income from SSI, but lower amounts of income from SSDI (Martin et al., 2006). In Razzano et al. (2006), analysis of variance found that females had significantly lower income from SSDI and lower total monthly personal income, but higher monthly income from SSI.

Other categorical demographic variables included mode of HIV infection, current living situation, incarceration history, using English as a first language, years in the U.S., and acculturation. In relation to mode of HIV infection, no significant differences were found between employed and unemployed individuals (Razzano & Hamilton, 2005; Razzano et al., 2006). Martin et al. (2004, 2006) did not find group differences based upon current living situation (e.g., stable, live alone, owning home, and receipt of financial housing assistance) and incarceration history between individuals seeking employment and not seeking employment. Using English as first language was not different between unemployed individuals and employed individuals (Van Gorp et al., 1999; Van Gorp et al., 2007). Regarding years in the U.S. and acculturation, analysis of

variance found no proportional difference between employed and unemployed individuals (Burns et al., 2007).

Health or functioning variables. Medical or functional variables overall included diagnosis of HIV/AIDS; time since diagnosis; count of CD4 cells; viral load; various medical conditions or symptoms of HIV-related illness such as fatigue, health or physical functioning; and work-related abilities (see Appendix C).

Findings on group differences based upon AIDS/HIV diagnosis varied. In Bernell & Shinogle (2005)'s study, unemployed individuals (n = 1,849) were more likely to have an AIDS diagnosis (48% of n = 1,849) than employed individuals (22% of n = 1,015). In analysis of variance, an AIDS diagnosis was shown to be significantly related to unemployment (Darko et al., 1992). Specifically, unemployment rates were significantly higher among individuals with AIDS or ARC compared to individuals with HIV and without HIV diagnosis. However, no significant difference in employment rate was shown between individuals with and without HIV diagnosis.

In the following studies, diagnosis of AIDS did not differentiate between employed and unemployed individuals (Burns et al., 2006, 2007; Razzano & Hamilton, 2005; Razzano et al., 2006; Van Gorp et al., 2007). Similarly, Martin et al. (2006) found no differences between individuals seeking employment and not seeking employment based upon AIDS diagnosis. In addition, days since HIV diagnosis did not differentiate between individuals seeking employment and not seeking employment (Martin et al., 2006). Of the 21 studies, Massagli et al. (1994) conducted an independent t-test to

compare individuals with a job and those without a job on number of hospitalizations since an AIDS diagnosis, and found that no significant difference between the two groups.

Findings on counts of CD4 cells and viral load were varied. Van Gorp et al. (1999) found a significantly higher mean of CD4 cell counts among employed individuals than unemployed individuals. Martin et al. (2004, 2006) also reported significantly higher CD4 cell counts among individuals seeking employment than individuals not seeking employment although no differences were found in viral load. However, both CD4 counts and viral load were not different between employed individuals and unemployed individuals in Van Gorp et al.'s (2007) study. Using chi-square analyses, Bernell and Shinogle (2005) reported unemployed individuals were more likely to have less than 50 or between 50 and 199 CD4 cell counts, with employed individuals more likely to have above 200 CD4 cell counts.

Blalock et al. (2002) also reported, using analyses of variance, a significantly higher mean viral load but a lower mean CD4 cell count among unemployed individuals. These two variables were still found to be significantly related to employment status when the degree of illness severity was taken into account, using multivariate analysis of covariance (Blalock et al., 2002). In Burns et al.'s (2007) study, analysis of variance also found a significantly higher mean of current CD4 cells among employed individuals, but no significant difference on viral load.

Two studies examined group differences based upon neurocognitive or neuropsychological functioning. Heaton et al. (1994) conducted chi-square analyses for group comparisons between individuals with neurocognitive impairment and without

impairment among those living with HIV and reported that among the 289 participants with HIV, the probability of unemployment of those with neuropsychological impairment were approximately three times higher than those without the impairment. Even after excluding 57 participants of the 289 for having some potentially related medical symptoms, higher rates of unemployment were shown among those with neuropsychological impairment. Of 131 employed participants who responded to work-related questions, those with neuropsychological impairments perceived a significant decrease in their work ability compared to those without neuropsychological impairment. Similarly, Van Gorp et al. (1999) also reported significantly higher neuropsychological impairment among unemployed individuals compared to employed individuals. Furthermore, univariate analyses of covariance in which age, CD4 cell counts, and physical limitations were covariates found significantly lower neuropsychological function (i.e., tasks of learning and memory and response inhibition) among unemployed individuals than employed individuals (Van Gorp et al., 1999).

In relation to HIV-related symptoms, Bernell & Shinogle (2005) reported a higher percentage of symptoms of illness among unemployed individuals. Martin et al. (2004) also found medical symptoms significantly higher among individuals not looking for employment than individuals looking for employment. These symptoms included forgetting things, light headedness, fever, poor appetite, eye problems, trouble with nose or mouth, headaches, swallowing problem, nausea, coughing, and chest pain. Similarly, Martin et al. (2006) reported lower health functioning among individuals not seeking

employment based upon lower scores on general health, physical functioning, physical role, and bodily pain indices.

Regarding fatigue, Van Gorp et al. (1999) demonstrated that level of fatigue was significantly higher among unemployed individuals than employed individuals. In Darko et al.'s (1992) study, analyses of variance found that fatigue significantly interfered with work among individuals with AIDS or ARC, compared to individuals in a comparison group without HIV (Darko et al., 1992). In addition, employment loss due to fatigue was significantly higher among unemployed individuals with AIDS or ARC, compared to individuals with only lymphadenopathy or in a comparison group without HIV infection (Darko et al., 1992). However, Van Gorp et al. (2007) and Razzano & Hamilton (2005) found no significant differences in level of fatigue between employed and unemployed individuals. Fatigue was also not found to be related to seeking employment in Martin et al.'s (2004) study.

In terms of physical limitations or functioning, unemployed individuals were more likely to have physical limitations and medical symptoms than employed individuals (Van Gorp et al., 1999). Van Gorp et al. (2007) also reported findings that employed individuals demonstrated significantly better functioning on a timed motor measure with a dominant hand and learning and memory measures. Likewise, Burns et al. (2007) found, using an analysis of variance, significantly higher physical health functioning among employed individuals than unemployed individuals (Burns et al., 2007). However, physical limitation was not different between the groups in Van Gorp et al.'s (2007) study.

Twamley et al. (2006) conducted analysis of covariance in which age and education were controlled to investigate group differences on estimated highest level of work-related ability and current work-related abilities, respectively (i.e., reasoning, and math development, general learning, verbal, aptitude, numerical, and spatial aptitude, form perception, clerical perception, motor coordination, finger dexterity, manual dexterity, eye-hand-foot, total test score, and number of jobs). Regarding estimated highest level of work-related abilities, employed individuals demonstrated significantly higher scores on overall performance, reasoning development, language development, general learning, numerical aptitude, and spatial aptitude, than unemployed individuals. In relation to current work-related ability, employed individuals demonstrated better total scores and spatial aptitude.

Mental health-related variables. Psychosocial and mental health-related variables involved general mental health, prevalence of psychiatric disorders, past or current mental illness and substance dependence, beliefs of one's own ability to control his or her health, acceptance of disability, health distress, perceptions on quality of life, life-satisfaction and enjoyment, self-efficacy, perceived social support, and mental functioning (see Appendix D).

Using chi square analyses, several studies found no significant group differences based on lifetime alcohol or drug use between employed and unemployed individuals. Specifically, Blalock et al., (2002) reported no significant group differences on substance use disorders between employed and unemployed individuals. Similarly, Martin et al. (2004) did not find significant differences on drug or alcohol use between individuals

seeking employment and individuals not seeking employment. No group differences were also found on lifetime alcohol abuse/dependence or substance abuse/dependence, respectively in Van Gorp et al.'s (2007) study. However, two studies reported history of intravenous drug use to be more prevalent among unemployed individuals than employed individuals (Bernell & Shinogle, 2005; Massagli et al., 1994).

Regarding psychiatric disorders, Martin et al. (2006) found no differences in mental health between individuals seeking employment and not seeking employment. Blalock et al. (2002) also did not find significant group differences in prevalence rates of psychiatric disorders. Similarly, Van Gorp et al. (2007) found no group differences between employed and unemployed individuals on current or lifetime major depression (chi-square analysis) as well as on level of depressive symptoms and perceived mental health (level of hopelessness, perceived quality of life, social support, and self-efficacy) from independent t-tests. In Heaton et al.'s (1994), employment status was not different based on depression.

However, Kielhofner et al. (2004) found having a history of mental illness as the only variable to be significantly related to an increased likelihood of successful employment. Analysis of variance found significantly higher mental health functioning as well as perceived control over health outcomes (internal) among employed individuals. Again, between-group analysis conducted by Blalock et al. (2002) found perceived overall quality of life to be significantly higher among employed individuals than unemployed individuals, but overall psychological functioning was not different when controlling for disease severity. Regarding perceived physical and mental health with

employment status, Razzano and Hamilton (2005) found from one-way ANOVAs that perceived overall health functioning, physical functioning, and role functioning were significantly higher among employed participants; however, perceived quality of life, health distress, energy/fatigue, mental health, pain, and cognitive and social functioning were not different in relation to employment status. In this study, although depression, as measured by the Beck Depression Inventory, did not appear significantly related to employment status, both employed and unemployed participants reported significant depressive symptoms (Razzano & Hamilton, 2005).

Degree of Relationship among Variables

A number of studies conducted either correlation or multiple regression to investigate the statistical significance of the relationship among variables or between each of the predictor variables and the criterion variables (Massagli et al., 1994; Leigh et al., 1995; Van Gorp et al., 1999; Rabkin et al., 2004; Henninger, 2006; Martin et al., 2006; Van Gorp et al., 2007)

Correlation. Correlation analyses in Henninger's (2006) study found that neuropsychological functioning (i.e., verbal, abstraction and executive functioning, information processing speed, attention, learning, memory, and motor) was negatively correlated with vocational functioning (i.e., reasoning, math, language, learning, verbal, numerical, spatial, form and clerical perceptions, motor coordination, finger dexterity, manual dexterity, eye-hand coordination).

In the other correlational analysis that included age, HIV immune status, global neuropsychological functioning, vocational functional functioning, and employment

found employment to be negatively correlated with age, HIV immune status, and global neuropsychological functioning, and positively correlated with vocational functioning. This finding remained similar when education was additionally taken into account; however, education was not found to be related to employment (Henninger, 2006).

Bernell and Shinogle (2005) conducted a bivariate probit model using employment as a criterion variable and the following variables as covariates: age, gender, race, education, living status, age of children, benefits (SSI, SSDI, and AFDC), HAART use, CD4 cell count, mental health, AIDS diagnosis, difficulty with ADLs, number of AIDS conditions, symptoms of illness, history of IV drug use, and geographic region (Midwest, South, and West). This analysis found variables significantly related to an increased likelihood of employment including HAART use, higher education, being Caucasian, being male, having better mental health, and living in the West. In contrast, individuals who received public benefits or had lower CD4 cell counts, an AIDS diagnosis, difficulties with activities for daily living, higher number of AIDS conditions, or more symptoms of HIV-related illness were less likely to have employment.

Multiple regression. Yelin et al. (2001) conducted a Cox proportional hazard regression to estimate the proportional hazard of employment loss in relation to demographic, medical, and work-related variables (age, race, AIDS, AIDS-related complex, male homosexual, intravenous drug use, physical requirements of jobs, discretion over work, member of labor union, and tenure on job). Of the predictor variables, AIDS, physical requirements of jobs, and discretion over work (pace of work, work procedures, what is produced, break time, sick leave, arrival and departure time)

were significantly related to subsequent work status. Specifically, participants with AIDS diagnosis were significantly more likely to stop working than those with AIDS-related complex or those with asymptomatic. Also, having a job that required more physically demanding work was significantly related to a higher probability of unemployment. Participants with more discretion over work (e.g., pace of work, time of breaks, sick leave, time of arrival and departure) were less likely to leave their job. However, intravenous drug use, membership in a labor union and tenure on the job were not found to be significantly related to loss of employment (Yelin et al., 1991).

Similarly, Massagli et al. (1994) conducted three Cox proportional hazards models to examine predictors of employment loss. In the first model into which seven variables (i.e., non-Hispanic White, college degree or higher education, professional/managerial job, clerical/sales job, no history of IV drug use, equal to or more than 35 weekly working hours, HMO insurance coverage) were entered, only no history of IV drug use was found to be significantly related to a high probability of longer duration of employment after AIDS diagnosis. When two variables (no history of hospitalization and severity of disease-very ill) were additionally entered, no history of IV drug use and no history of hospitalization increased the probability of longer duration of employment. When physical and mental efforts required at work were added to the third model, no history of IV drug use was found to be no longer significantly related to duration of employment after AIDS diagnosis; however, no history of hospitalization remained significantly related to longer duration of employment. In addition, individuals

with a job requiring higher mental efforts showed higher probability of longer duration of employment after ADIS diagnosis.

Leigh et al. (1995) conducted three regressions including probit regression, linear regression, and tobit regression using SAS. A probit regression analysis was used to investigate probability of employment (criterion variable), and tobit and linear regression analyses were used to examine working hours (criterion variable). The authors conducted probit and tobit regression analyses using the same predictor variables (AIDS, HIV-positive without AIDS, age, gender, marital status, education, assets, and clinic sites), but added one additional variable, which was unobserved tendency of participants to work (hazard rates), to the linear regression.

First, findings from the probit regression analysis indicated a negative relationship of AIDS diagnosis, age, and high school dropout with employment rates. Thus, this probit regression had a lower probability of employment among individuals with AIDS compared to individuals who were HIV-negative. Likewise, tobit regression had the same results; that AIDS diagnosis, age, and high school dropout were significantly and negatively related to working hours among both employed and unemployed individuals. However, having assets ($\geq \$25,000.00$ of real estate, business interests, and savings) was significantly and positively associated with working hours. In the linear regression, AIDS diagnosis and being a high school dropout were again found to be significantly and negatively related to working hours, and having assets ($\geq \$25,000.$) was found to be significantly related to increase of working hours. Being African American was found to be negatively related to working hours in the linear regression, but not in the tobit and

probit regression analyses. When disability index was added to the probit and linear regression, it was also shown to be significantly and negatively correlated with both employment and working hours (Leigh et al., 1995).

In Rabkin et al. (2004), five multiple regression models were conducted for 141 participants (five separate multiple regression analyses) and for 70 participants who were working at least four hours per week at study endpoint, respectively. The five multiple regression analyses for each of the two groups were conducted at five different time points including (a) 1 year before study endpoint-time 4, (b) mean values of time 4, 5 and 6, (c) values subtracted time 4 from time 6, (d) six months before study end point, and-time 5 (e) study endpoint-time 6. A total of 21 predictor variables entered in the regression analyses included socio-demographic (age, education, vocational rank, race), medical (CD4 cell, HIV viral load, HIV-related symptoms, physical symptoms), psychiatric (severity of depressive symptoms, lifetime, and current depressive disorders, and drug or alcohol dependence), and neuropsychological tests (scores on Trail Making Test A and B, California Verbal Learning Test, WAIS Digit Symbol Test, Stroop Color and Word Test, and Grooved Pegboard), and financial benefits (SSI and SSD).

From five multiple regression analyses for the 141 participants at five different time points, Rabkin et al. (2004) found six variables (physical limitation, mood diagnosis, lifetime mood diagnosis, SSI, SSD, and performance on Trail Making A or B-executive functioning) to significantly predict working hours across the five regression models. Specifically, having physical limitations, receiving either SSD or SSI, having a past or current depression diagnosis or more severe depressive symptoms, and poor executive

functioning (lower scores on Trail A or B Making test) were related to a decrease of working hours.

In regards to the five regression analyses conducted for participants working at the endpoint of the study (n = 70), five variables were found to be significant predictors for working hours (education, physical limitations, mood diagnosis, SSD, and performance on Stroop Color and Word Test) across the five regression models. Working hours negatively related to physical limitation, a lifetime depression diagnosis, and SSD, but positively related to education (Rabkin et al., 2004).

In a post hoc model with standardized regression coefficients including employment, education, age, vocational functioning, HIV immune status, and details of neuropsychological functioning (verbal, abstraction and executive functioning, information processing speed, attention, learning, memory, and motor), employment was found be significantly and negatively related with HIV immune status, abstraction, and learning, but positively related to memory; none of the other variables were found to have significant relationships with employment. In the modified standardized coefficients using the same variables, only one variable, abstraction turned out to be insignificant (Henninger, 2006)

In Martin et al.'s (2006) study, a final model of survival analysis was conducted using seven predictor variables, including group membership (intervention vs. comparison), gender (male vs. female), physical functioning (SF 36 Role Physical), income from SSI and State Disability Income (SDI) in a month before baseline assessment, total income in a month before baseline assessment, and earnings in a year at

baseline assessment. This model found four significant predictors of a higher likelihood of returning to work: (a) being in the intervention, (b) being a female, (c) increase of scores on role physical scale, and (d) higher income from SDI prior to baseline (Martin et al., 2006). Specifically, the probability of return to work appeared three times higher in the intervention group than the comparison group and two and half times higher among females compared to males. As scores on the subscale Role Physical increased for each ten points (scores range from 0 to 100), the probability of return to work increased by 9%. In addition, individuals who received state disability income, which is provided for a short-term period (e.g., 6 months), were more likely to return to work than those who did not receive it such as those receiving SSI or SSDI. In regard to employment, 70% of those in the intervention group (n = 98) returned to work in a year versus 50% of those in the comparison group (n = 28). Other variables predicting longer time to return to work included being male, lower scores on Role Physical, and no SSI income or SDI income.

A Cox survival regression analysis using 32 variables demonstrated only four variables (age, duration of unemployment before study entry, AIDS diagnosis, and recognition and learning memory) to be significant predictors of finding employment (Van Gorp et al., 2007). Employed individuals were less likely to have an AIDS diagnosis, but were more likely to be younger, to have a shorter duration of unemployment, and to perform better on a recognition and learning memory test. Variables included in these analyses, but not found to be a significant predictor of finding employment were: age, duration of unemployment before study entry, sexual orientation, ethnicity, education, financial assistance, viral load, CD4 cell counts, CDC AIDS

classification, major depression, alcohol/substance abuse, nine different psychosocial ratings (i.e., self-efficacy, fatigue, physical limitations, hopelessness, depression inventory, perceived social support, quality of life, social conflict, and social support), and seven neurocognitive tests (e.g., IQ test and recognition and learning memory measure). In addition, a time-dependent survival regression confirmed that finding employment during the follow-up was significantly related to performance on recognition and learning memory test (Van Gorp et al., 2007). In the correlational analyses conducted to examine retention at work once obtaining employment using the 32 variables, only having AIDS diagnosis was found to be positively related to employment duration.

Van Gorp et al. (2007) also reported depressive symptoms to be significantly and negatively related to employment status in a proportional hazard survival regression analysis in which depressive symptoms (scores) before and after finding employment were entered as criterion variables and time to finding employment as a predictor variable. In this analysis, depressive symptoms were not significantly related to time for finding employment.

Jefferson (2007) conducted multiple regression to predict job satisfaction using four variables (acceptance of disability, job search self-efficacy, social support, and depression) and found that overall the model explained 29.9% of variance in job satisfaction, and that depression significantly decreased job satisfaction.

Prediction of Group Membership

Several studies conducted discriminate analysis or logistic regression to predict group membership (employed or unemployed) (Burn et al., 2006, 2007; Conover et al., 2006; Darko et al., 1992; Jefferson, 2007; Kielhofner et al., 2004)

Discriminant analysis. Discriminant analysis conducted to investigate prediction of group membership (employed vs. unemployed) found that the number of CD 4 cells was significantly predictive of membership when entered with four HIV-related laboratory results (total globulin, hematocrit, Serum lactic dehydrogenase, and serum albumin) (Darko et al., 1992). Overall, this model correctly classified 83.1% of the participants. Employed individuals showed significantly higher numbers of CD4 cells compared to unemployed individuals.

Logistic regression. In Van Gorp et al.'s (1999) study, two types of logistic regression analyses (forward entry and forced entry regression) were conducted to determine relationships of CD4, fatigue, age, physical limitation, medical symptoms, and neuropsychological tests (California Verbal Learning Test, Strop Color Word Test, and Trail Making Test B) with employment status. The forward entry regression analysis found physical limitations and results from the Trail Making Test B (executive functioning) as the only variables retained, with a hit rate of 77% for the employed group, 55% for the unemployed group, and 66% for the entire group. The forced entry regression analysis for which all eight variables were entered showed a higher prediction rate of unemployment (hit rate of 70%) with the overall hit rate of 73%.

Kielhofner et al. (2004) conducted logistic regression using the Occupational Performance History Interview (participants' narratives were determined as regressive, progressive, or stable) and reported findings that individuals with a history of mental illness, which was a variable that significantly increased the likelihood of successful employment, were still more likely to attain successful employment outcomes compared to those without a history of mental illness. In this analysis, individuals whose narratives were progressive were more likely to achieve successful employment outcomes compared to individuals with regressive narratives. However, there were no significant outcome differences between individuals with regressive narratives and those with stable narratives (Kielhofner et al., 2004).

Burns et al. (2006) conducted a forced hierarchical logistic regression using four steps. First, race and time since diagnosis were entered into the regression model, and race was found as a significant predictor of employment (higher rates of employment among Latino compared to White); however, time since diagnosis was not found to significantly predict employment status. In step two, age was added to the model, and an increase in age was found to be significantly related to lower likelihood of employment. Next, CD4 cell count and viral load were additionally entered into the model, and an increase of CD4 counts was found to be related to the higher likelihood of employment, but not viral load. In step four, mental and physical health were added to the model in step three, and higher mental and physical health functioning was found to be significantly related to higher likelihood of employment.

Burn et al. (2007) conducted a backward binary logistic regression model using four variables (age, CD4 count, beliefs of internal control over health outcomes, and mental health functioning) and reported that all four variables were significantly related to employment and that the overall percent correctly predicted was moderately good at 72.2%.

Conover et al. (2006) used logistic regression to examine relative probability of employment status using age, gender, race/ethnicity, education, stable residence, marital status, children in household, sexuality, physical health status, viral load, mental health, and drug/alcohol abuse. Of these variables, being female and having moderate or worse than moderate physical health were significantly related to a less likelihood of current employment. On the other hand, experiencing a major depressive episode and having a lower psychiatric rating were significantly related to an increased likelihood of current employment. The authors explained the finding on a major depressive episode by assuming that those without a major depressive episode appeared to have more severe mental health issues (all participants have triple diagnoses-HIV/AIDS, mental illness, and substance abuse disorders). In another multivariate analysis using the same variables, but in relation to employment for the last three years instead of current employment, being female and having moderate or worse than moderate physical health were again found to be significantly related to a less likelihood of current employment. However, mental health was not significant. Other variables found to be significantly related to a lower likelihood of employment for the last three years included being 35 to 49 years old or older. A higher likelihood of employment for the last three years was found among

heterosexual individuals, individuals having between 13 and 15 years of education compared to less than 12, and individuals with alcohol abuse only compared to those with both drug and alcohol abuse.

Jefferson (2007) conducted logistic regression using acceptance of disability, job search self-efficacy, social support, and depression and found all four variables were significant predictors of employment and explained 56.9% of variance in employment status. Specifically, higher levels of acceptance of disability and social support significantly increased the probability of employment; however, depression decreased the likelihood of being employed. Of these four variables, social support contributed the most.

Limitations and Future Research Suggested across the Studies Reviewed

Several limitations were cited by authors of the studies included in this review. Those limitations included, but are not limited to: (a) not being able to determine certain causal relationship between variables or to provide full explanation of the relationships due to limitations of study designs such as non-random assignment of participants and no comparison group (Blalock et al., 2002; Burns et al., 2007; Kielhofner et al., 2004; Leigh et al., 1995; Martin et al., 2004, 2006; Twamley et al., 2006) (b) small sample size (Conover et al. 2006; Henninger, 2006; Razzano & Hamilton, 2005; Razzano et al., 2006; Twamley et al., 2006). (c) lack of or no females as participants (e.g., Burns et al., 2006; Rabin et al., 2004, 2006), and (d) no follow-up investigation that enabled demonstration of additional relationships between variables or changes in relationships (Van Gorp et al., 1999).

Based upon the limitations, authors suggested directions for future research such as additional variables to be included (e.g., insurance coverage, time since diagnosis), use of longitudinal research (Bernell & Shinogle, 2005; Leigh et al., 1995, Van Gorp et al., 1999), and use of adequate control groups to more effectively investigate effects of interventions (Kielhofner et al., 2004; Martin et al., 2006).

CHAPTER 3

METHOD

The primary purpose of this study was to investigate variables that predict membership of either the group of consumers with employment or the group of those without employment outcomes when they exited the VR program, by using the Rehabilitation Services Administration data file (RSA-911).

Research Design and Research Questions

This study used a correlational research design (Tabachnic & Fidell, 1989), and research questions are:

1. What are the socio-demographic characteristics at application, service-related variables, types of closure, and reasons for closure for participants with HIV/AIDS?
2. Are there statistically significant differences between participants with HIV/AIDS who exited the VR program with employment or without employment on socio-demographic characteristics at application and closure, health variables, and service-related variables?
3. Which variables predict an employment or unemployment outcome between participants with HIV/AIDS who exited the VR program with employment or without employment at closure?
- 4a. What are employment status, hours worked per week and weekly earnings, and types of occupation at closure among participants who exited the VR program with an employment outcome?

- 4b. Do length of participation and cost of purchased services vary with number of services received?
- 4c. Are there statistically significant differences in weekly earnings based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics?

Participants

Data for this study was extracted from the Rehabilitation Services Administration data file (RSA-911) for the fiscal year (FY) 2006 (RSA, 2006). Of the entire database containing 617,149 individuals (all disabilities), for the purpose of this study, only individuals whose cause of primary disability was HIV or AIDS were extracted from the data. The number of individuals who reported HIV/AIDS as a cause or source of their primary disability was 2,271, which constitutes 0.37% of the entire population in the RSA 911 database in 2006 (N = 617,149). The total number of participants with HIV/AIDS was used for research question one.

For research questions two through four, the analyses excluded racial groups with relatively small numbers including American Indians or Alaska Natives (0.8% of 2,271, n = 19), Asians (0.7%, n = 15) and Native Hawaiians or Other Pacific Islanders (0.3%, n = 6), Multiple Races, non-Latino (0.5%, n = 11); therefore, participants for research questions two through four were selected from only Whites (n = 803), African Americans (n = 1,174), and Latinos (n = 210). Specifically, of 2,187 White, African American, and Latino participants, 1,278 participants were selected for research question two and three, who exited the VR program with employment (n = 549) and the group of those who

exited the program without employment after receiving services (n = 629). Finally, research question four was answered using only the group of participants who exited the VR program with employment (n = 549).

Data Collection

The RSA-911 national data file for fiscal year 2006 was obtained, at no cost, through Rehabilitation Services Administration (RSA), a component of the Office of Special Education and Rehabilitative Services (OSERS) in the U.S. Department of Education. The RSA-911 data file for fiscal year 2006 is available to the public through the RSA and provides demographic information, services provided, and vocational outcomes, which were collected from all state/federal vocational rehabilitation agencies in U.S., for all consumers who contacted the state vocational rehabilitation program in the fiscal year 2006.

Variables

Variables were categorized into socio-demographic variables, health variables, service-related variables, and outcome variables as follows:

Socio-Demographic Variables

The socio-demographic variables included:

1. Gender (0 = male and 1 = female; categorical variable)
2. Age at application and closure (ranged from 18 to 69 and from 18 to 70, respectively; continuous variable)

3. Race/ethnicity (1 = White, 2 = African American, 3 = American Indian or Alaska Native, 4 = Asian, 5 = Native Hawaiian or Other Pacific Islander, 6 = Latino, and 7 = Multiple Races, non-Latino; categorical variable)
4. Level of education at application and closure (1 = less than high school, 2 = special education certificate, 3 = high school graduate or equivalent certificate, 4 = some college with no degree, 5 = associate degree or vocational/technical certificate, and 6 = bachelor degree or higher degree; categorical variable)
5. Employment status at application (1 = employed w/o supports in integrated setting, 2 = self-employment, 3 = homemaker 4 = employment with supports in integrated setting, 5 = not employed student, 6 = not employed trainee, intern or volunteer, and 7 = not employed others; categorical variable)
6. Hours worked in a week at application (weekly hours worked ranged from 0 to 55 hours; continuous variable)
7. Weekly earnings at application (weekly income ranged from \$ 0 to \$1,200; continuous variable)
8. Primary source of support at application and closure (1 = personal income, 2 = family & friends, 3 = public support, and 4 = all other sources ; categorical variable)
9. Living arrangement (1 = private residence, 2 = community residential/group home, 3 = halfway house, 4 = substance abuse treatment center, and 5 = homeless/shelter; categorical variable)
10. SSI at application and closure (0 = no and 1 = yes; categorical variable)

11. SSDI at application and closure (0 = no and 1 = yes; categorical variable)
12. Medicaid at application and closure (0 = no and 1 = yes; categorical variable)
13. Medicare at application and closure (0 = no and 1 = yes; categorical variable)

Health Variables

Health variables included:

1. Primary disability caused by HIV/AIDS (1 = general physical debilitation, 2 = other physical impairments, 3 = psychosocial impairments, 4 = blindness, 5 = other mental impairments, 6 = mobility orthopedic/ neurological impairments, 7 = respiratory impairments, 8 = cognitive impairments, and 9 = all others; categorical variable)
2. Secondary disability (0 = no and 1 = yes; categorical variable)
3. Cause of secondary disability (1 = no secondary disability, 2 = depressive and other mood disorders, 3 = drug abuse or dependence other than alcohol, 4 = HIV/AIDS, 5 = physical disorder, 6 = accident/injury other than TBI or SCI, 7 = cause unknown, and 8 = all others; categorical variable).
4. Significant disability (0 = no and 1 = yes; categorical variable)

Service-Related Variables

Service-related variables included:

1. Source of referral (1 = education institution, 2 = physician or other medical personnel or medical institutions, 3 = welfare agency, 4 = community rehabilitation programs, 5 = social security administration, 6 = one-stop

employment/training centers, 7 = self-referral, and 8 = other resources;
categorical variable)

2. Length of participation in the program (months in the program ranged from 2 months to 162 months; continuous variable).
3. Cost of purchased services (ranged from \$0.00 to \$64,860.00; continuous variable).
4. 12 services received (0 = not provided and 1 = provided)

Regarding services received, of a total of 22 vocational rehabilitation services provided in the RSA dataset (2006), services provided to a small percentage of participants to be included in the analysis were excluded from this study including disability related augmentative skills training (.9% of participants), basic academic remedial or literacy training (.8%), reader (less than .1%), interpreter (less than .1%), personal attendant (.3%), technical assistance (1.6%). As a result, a total of 12 Rehabilitation services were included and their definitions according to the RSA-911 Case Service Reporting Manual (2006, pp. 22-30.) are:

- (a) Assessment. Services provided during the process of determining eligibility and services needed for an individual, including trial work-experiences and extended evaluation.
- (b) Diagnosis and treatment of impairments. A variety of services provided to an individual for diagnosis and treatment of an impairment, including but not limited to corrective surgery, diagnosis and treatment for mental and emotional disorders, dentistry, nursing services,

hospitalization, drug and supplies, assistive aids, eyeglasses and visual services, podiatry, physical therapy, occupational therapy, mental health service, treatment of acute or chronic medical complications, special services for the treatment of end-stage renal disease, and many other services.

- (c) Vocational rehabilitation counseling and guidance. Therapeutic counseling and guidance services required specifically to obtain an employment outcome, which is different from general counseling that occurs between the counselor and the individual during the rehabilitation process. These services include personal adjustment counseling; counseling with relation to medical, family, or social issues; vocational counseling; and any other types of counseling and guidance.
- (d) College training. Academic training beyond high school through institutions of higher education including technical college, for the purpose of obtaining any type of higher education degree, a certificate, or other educational credential that leads to a degree.
- (e) Occupational training. Occupational, vocational, or job skill training provided by a community college and/or business, or vocational training school for the purpose of employment achievement; training does not lead to an academic degree or certification.

- (f) Job readiness training. Training provided for the preparation of an appropriate and effective working attitude and behaviors such as being at work on time with appropriate dress and grooming, appropriate work behaviors, and increasing productivity.
- (g) Job search assistance. Assistance in conducting a job search. Services include preparing a resume, finding job opportunities, developing interview skills, and communicating with employers.
- (h) Job placement assistance. A referral to a certain job for a job interview, whether or not the individual obtained the job.
- (i) On the job supports. Services provided to an employed individual for the purpose of job stability and job retention, including job coaching, follow-up services, and job retention services.
- (j) Transportation. Financial support and training provided to ensure an individual's means of travel. Examples include travel and related expenses for a personal care attendant or aide, relocation expenses that occur due to a job placement, the purchase and repair of vehicles, and training for public transportation use.
- (k) Maintenance. Financial supports provided for basic and necessary expenses in connection to participation in VR service and work, such as costs of uniforms or other proper clothing, short-term expenses (e.g., food and shelter), and initial one-time costs (e.g., security deposits for utilities).

- (1) Information and referral. Services provided when an individual needs services from other agencies as the services are not provided through the VR program.

Outcome Variables

Outcome variables included:

1. Type of closure (1 = exited as an applicant, 2 = exited during or after a trial work experience/extended evaluation, 3 = exited with an employment outcome, 4 = exited without an employment outcome, after receiving services, 5 = exited without an employment outcome, after a signed IPE, but before receiving services, 6 = exited from an order of selection waiting list, and 7 = exited without an employment outcome, after eligibility, but before an IPE was signed).
2. Reasons for closure (1 = achieved employment outcome, 2 = unable to locate or contact, 3 = refused services or further services, 4 = failure to cooperate, and 4 = others).
3. Employment status at closure (1 = employment without supports in integrated setting, 2 = employment with supports in integrated setting, 3 = self-employed, and 4 = homemaker; categorical variable).
4. Hours worked in a week at closure (mean weekly hours worked; continuous variable)
5. Weekly earning at closure (mean weekly income; continuous variable).

6. Type of occupation at closure (1 = professional, technical, and managerial occupations; 2 = clerical and sales occupations; 3 = service occupations; 4 = agricultural, fishery, forestry, and related occupations; 5 = processing occupations; machine trades occupations; 6 = benchwork occupations; 7 = structural work occupations; and 8 = miscellaneous occupations; categorical variable).

Data Analyses

All statistical data analyses were performed using SPSS software (Green & Salkind, 2007; Wagner, 2007).

Research question one: what are the socio-demographic characteristics at application, health variables, services-related variables, type of closure, and reasons for closure for participants with HIV/AIDS? Statistical analyses for research question one included descriptive statistics (i.e., frequency, percent, mean, and standard deviation).

Research question two: are there statistically significant differences between participants with HIV/AIDS who exited the VR program with employment or without employment on socio-demographic characteristics at application and closure, health variables, and service-related variables?

For research question two, chi-square analyses (for categorical variables; $\alpha = .05$) and independent t-tests (for continuous variables; $\alpha = .05$) were conducted to determine differences between individuals who exited the VR program with employment ($n = 549$) and those who exited the program without an employment outcome after receiving services ($n = 629$). Which cells (observed frequency) in chi-square tables are

significantly different from expected frequency was examined using a standardized residual method (MacDonald & Gardner, 2000). Cells with standardized residuals exceeding ± 2 were considered to have observed frequencies significantly different from expected frequencies (Haberman, 1973; MacDonald & Gardner, 2000).

Assumptions of chi-square analysis were checked: (a) the observations within the cells are independent (each participant contributes data to only one cell), (b) the observations are measured as frequencies, and (c) no more than 20% of the cells have an expected frequency of less than 5 (Ary et al., 2002; Cronin, 1981). Significant disability was not included in the chi-square analyses as 50% (2 cells) of the cells have expected frequencies less than 5 (only nine of 1178 participants had no significant disability).

Assumptions of independent t-tests were also checked: (a) the observations are independent of each other, (b) the test variables are normally distributed, and (c) the variance of distribution of the test variables for a group to be compared is equal to one for the other group to be compared, which is also called homogeneity of variance. Of six continuous variables subject to independent t-tests (age at application and closure, weekly earning at application, working hours per week at application, length of participation, and cost of purchased services), age at application and age at closure were normally distributed, but not the other variables. The assumption of homogeneity of variance was checked by Levene's test, and the assumption was violated for three variables including weekly earning and working hours per week at application and cost of purchased services. In spite of the violation of the assumptions of t-test (either or both of normal distribution or/and homogeneity variance assumption), all of the continuous variables were tested for

significance of observed differences in the means because these analyses were exploratory and conducted to determine potential variables to be entered into the logistic regression analysis; however, this may suggest that the results of t-tests using these variables need to be interpreted with caution.

Research question three: which variables predict an employment or unemployment outcome between participants with HIV/AIDS who exited the VR program with employment or without employment at closure? In order to determine predictive variables for employment status of the participants at closure, logistic regression analyses were conducted using cross validation. A logistic regression model was employed to estimate a predictor variable's contribution while simultaneously taking other predictor variables into account (Chan, 2004b; Katz, 1999). Logistic regression was considered to be most appropriate for research question three as the criterion variable of employed/not employed was binary (Katz, 1999) and predictor variables included both continuous and categorical variables (Keith, 2006).

Cross validation was conducted to address consistency of results (e.g., predictive power of the logistic regression) obtained from two analyses (Mertler & Vannatta, 2001; Tabachnick & Fidell, 1989). For the purpose of cross validation, the total number of White, African American, and Latino participants (N = 1,178) was randomly divided into two groups. Each group consisted of 589 participants, which accounted for 50% of the 1,178 participants.

The two groups were comparably distributed in relation to employment status at closure and race. Specifically, unemployed and employed individuals at closure in Group

One were 312 (53%) and 277 (47%), respectively, and 317 (53.8%) unemployed individuals and 272 (46.2%) employed individuals in Group Two. Employment rates of White, African American, and Latino individuals were 48.3 (n = 116 of 240), 45.1% (n = 133 of 295), and 51.9% (n = 28 of 54) in Group One, and 50.6 (n = 117 of 231), 43.7% (n = 124 of 284), and 41.9% (n = 31 of 74) in Group Two.

First, variables that have been reported as significantly related to employment in other studies (i.e., race, gender, age, and length of participation) and variables found to be significantly different between the employed and unemployed participants at closure in this study were initially selected to be entered into the analyses (i.e., cause of secondary disability, primary source of support at application, employment status at application, source of referrals, eight service variables, cost of purchased services, public benefits and insurance coverage at closure, education at closure). The criterion variable was type of closure (coded 0 = exited without an employment outcome and 1 = exited with employment).

Prior to data analysis, screening of data was performed for Group One and Two to check missing data, outliers, normality, linearity, and multicollinearity (Mertler & Vannatta, 2001; Tabachnick & Fidell, 1989). For the purpose of data screening, all categorical variables were dummy coded to be entered into the multiple linear regression.

Regarding missing data, frequency analysis demonstrated: (a) a total of eight participants with missing values in Group One (five participants without information on both SSI and SSDI and three participants without information on both Medicaid and Medicare) and (b) one participant with missing information on both SSI and SSDI.

Participants with those missing data were dropped from the analyses (Mertler & Vannatta, 2001; Tabachnick & Fidell, 1996). As a result, a total of 581 participants remained in Group One and 588 participants in Group Two.

Next, univariate and multivariate outliers were checked for both dichotomous and continuous variables in Group One and two. Regarding dichotomous variables, variables with an uneven split (90%-10%) between categories were considered as an outlier and therefore dropped or combined with other variables as the correlation coefficients of these variables with others may be shortened and the scores in the category with 10% of the participants may be more influential than those in the category with 90% of the cases (Tabachnick & Fidell, 1989). Dichotomous variable that was excluded from the analysis due to outliers was employment status at application (all categories). Two categories including Latino (race; 0 = yes and 1 = no) and drug abuse or dependence other than alcohol (cause of secondary disability; 0 = yes and 1 = no) were combined with another category 'non-White' and 'others', respectively. Two continuous variables, hours worked in a week and weekly earnings at application were dropped from the analysis as they were reported by only less than 10% of the participants who were employed at application.

Univariate outliers for three continuous variables (cost of purchased services, length of participation in the program, and age at closure) were also checked by transforming the data to standardized scores (z-scores); any standardized scores in excess of ± 3.00 were assumed potential outliers (Mertler & Vannatta, 2001; Tabachnick & Fidell, 1996). As a result, a total of 20 participants were found to have potential outliers in one or more of

the three continuous variables in Group One and 23 participants in Group Two. As some of those might have overlapping outliers, determination of deleting participants was made after checking multivariate outliers by computing Mahalanobis distance, which is the distance of a case from the centroid of the remaining cases where the centroid is the point created by the means of all the variables (Mertler & Vannatta, 2001; Tabachnick & Fidell, 1996). Multivariate outliers were determined when the obtained value for Mahalanobis distance exceeded the chi-square critical value at $\alpha = .001$. To perform this, once Mahalanobis distance was requested in the preliminary linear regression, Explore was then conducted to determine which participants exceeded the chi square criteria of $\chi^2 (26) = 54.052$ at $p = .001$ and to eliminate them. As a result, six cases were identified to have multivariate outliers, all of whom previously showed univariate outliers, in Group One. In Group Two, four participants, three of whom showed univariate outliers, had multivariate outliers. Consequently, in Group One, 20 participants with potential univariate or multivariate outliers were dropped, resulting in a total of 561 participants remained in the group. In Group Two, 24 participants were dropped so that a total of 564 participants remained in the group.

Multicollinearity among predictor variables was then checked by examining collinearity statistics (Tolerance and Variance Inflation Factor) for each predictor variable (Allison, 1999; Mertler & Vannatta, 2001; Tabachnick & Fidell, 1996). Tolerance for each predictor variable, which ranged between zero and one, is computed by $1 - R^2$, where R is calculated by regressing each variable on other predictor variables, and explains the extent to which the predictor variable under consideration can be

explained by all the other predictor variables. Accordingly, low tolerances indicate high multicollinearity (Allison, 1999). The Variance Inflation Factor (VIF), which is $1/\text{Tolerance}$, is the reciprocal of the tolerance, telling the degree of inflation of the variance of the coefficient due to multicollinearity among variables in a regression model, compared to what it would be if the variable were uncorrelated with any other variable in the model. Typically, values of VIF exceeding 10 are considered an indication of multicollinearity. However, as recommended for logistic regression, values above 2.5 were considered as multicollinearity for this study (Allison, 1999).

Regression coefficients of Group One found a total of four variables to have a VIF value higher than 2.5. These variables were two dichotomous variables including White (0 = no and 1 = yes; VIF = 3.394) and African American (0 = no and 1 = yes; VIF = 3.394) and two levels of education at application including high school or GED (VIF = 2.534) and post-secondary education, but no degree (VIF = 2.507). In Group Two, White (VIF = 2.852) and African American (VIF = 2.750) were again found to have a VIF value higher than 2.5. To solve a potential multicollinearity issue with race, African American and Latino were collapsed into non-White, leading race recoded as 0 = non-White and 1 = White. Regarding level of education, no change was made to it because the VIF values were slightly higher than the cut-point of 2.5 in Group One and was lower than the cut-point in Group Two.

Following the screening for multicollinearity among predictor variables, to confirm that no outlier existed in the data, screening for multivariate outliers were conducted three more times until finally no new outliers were identified (Tabachnick & Fidell, 1996). As

a result, a total of 558 and 564 participants remained in Group One and Group Two, respectively.

Finally, normality of the data for Group One was assessed using skewness (measure of the degree of symmetry of a distribution) and Kurtosis coefficients (measure of the degree of peakedness of a distribution). Significance tests for both skewness and kurtosis values were evaluated at an alpha level of .01. Following a common rule-of-thumb test for normality, variables with values of ± 2 or more of skewness or kurtosis after dividing the value of skewness or kurtosis by their standard error, respectively, were considered to have skewness or kurtosis (Mertler & Vannatta, 2000). Two continuous variables (costs of purchased services and months of participation in the program) were observed to be markedly skewed, and therefore, were converted to a categorical variable with four groups rather than transformed (Mertler & Vannatta, 2000; Streiner, 2002). The approach was to split the data values at round numbers to have groups of similar size (Altman, 2005). Once the two continuous variables were converted, multivariate outliers were rechecked and none of the participants were found to have outliers. Likewise, multicollinearity was diagnosed, but not found.

As a result of screening the data, a total of 28 variables (including categories of each categorical variable) were to be entered in the logistic regression model for both Group One ($n = 558$) and Group Two ($n = 564$). Note that variables coded as zero were used as a reference category in the binary logistic regression model and were not included in the total number of variables:

1. *Gender* (0 = male and 1 = female; categorical variable).

2. *Race* (0 = non-White and 1 = White; categorical variable).
3. *Depressive and other mood disorders* (0 = no and 1 = yes; categorical variable).
4. *Primary source of support at application* (0 = public benefits and 1 = other than public benefits; categorical variable).
5. *Source of referral* (0 = other referral, and 1 = community rehabilitation programs or one-step employment/training centers).
6. *Eight service variables* (i.e., VR counseling and guidance, job readiness training, job search assistance, job placement assistance, on the job support, transportation services, maintenance, information and referral services) (0 = not received and 1 = received).
7. *Length of participation in the program* (0 = less than 1 year, 1 = ≥ 1 year - < 2 years, 2 = ≥ 2 years - < 3 years, 3 = ≥ 3 years; categorical variable).
8. *Cost of purchased services* (0 = <\$500.00, 1 = \geq \$500.00 - <\$2,000.00, 2 = \geq \$2,000.00 - <\$5,000.00, 3 = \geq \$5,000.00; categorical variable).
9. *Public benefits & insurance coverage at closure* (SSI, SSDI, Medicaid, and Medicare at closure) (0 = not received and 1 = received).
10. *Level of education at closure* (0 = less than high school or high school graduate or GED, 1 = some post-secondary education, but no degree, 2 = associate degree or vocational/technical certificate, and 3 = bachelor degree or higher degree).
11. *Age at closure* (ranged from 19 to 64; continuous variable).

These 28 variables (including categories) were entered into the binary logistic regression (Enter method) for both Group One and Group Two. The Enter method was selected because the purpose of the analysis was to determine how the selected variables predict employment status at closure in Group One and to cross validate the same variables using Group Two (Chan, 2004a).

Goodness of fit test of the model was examined using the Hosmer-Lemeshow goodness of fit test, which compares expected frequencies with observed frequencies. (Allison, 1999; Chan, 2004a; Hosmer, Hosmer, Cessie, & Lemeshow, 1997). The null hypothesis that there is no difference between the observed and predicted values of the criterion was rejected at alpha level .05 or less; failure to reject the null hypothesis indicates that the model fits the data.

The results of the logistic regression analyses were reported using the Wald statistic and its corresponding significance level, odds ratio indicated with Exp (B), and 95% confidence interval for the odds ratio (Mertler & Vannatta, 2001; Wright, 1995). The Wald statistic and the corresponding significance level test was used to determine statistical significance of each predictor variable in the model, using the alpha level .05. Odds ratios less than 1 and more than 1.0 indicate change in the likelihood of employment (a decrease and increase, respectively) (Mertler & Vannatta, 2001).

Research question four: (a) what are employment status, hours worked per week and weekly earnings, and types of occupation at closure among participants who exited the VR program with an employment outcome? (b) does length of participation and cost of purchased services vary with number of services received? (c) are there statistically

significant differences in weekly earnings based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics?

Descriptive statistics (frequency, percent, and SD) were used to answer research question four (a). In addition to its average, weekly earning was also converted to a categorical variable with four categories (0 = <\$200.00, 1 = \geq \$200.00 - <\$400.00, 2 = \geq \$400.00 - <\$500.00, 3 = \geq \$500.00) to provide more detail. To answer the subsequent question (4b), a new variable, the number of services received was created by summing numbers of services each participant received while in the program, and coded as 0 = 1 - 3 services, 1 = 4 - 5 services, 2 = 6 - 7 services, and 3 = more than 8 services (up to 14). Chi-square analyses with alpha level = .05 were then conducted. Regarding research question (4c), weekly earning that was converted to a categorical variable with four categories (0 = <\$200.00, 1 = \geq \$200.00 - <\$400.00, 2 = \geq \$400.00 - <\$500.00, 3 = \geq \$500.00) was used rather than as a continuous variable, because its distribution was remarkably skewed (Mertler & Vannatta, 2000; Streiner, 2002). Chi-square analyses with alpha level = .05 were then conducted to examine significant differences in weekly earning based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics, except for age at closure for which an analysis of variance was conducted.

As in research question two, in chi-square analyses conducted to answer research question 4b and 4c, which cells (observed frequencies) in chi-square tables are significantly different from expected frequencies was examined using a standardized

residual method (MacDonald & Gardner, 2000). Cells with standardized residuals exceeding ± 2 indicate there are significant differences between expected and observed frequencies (Haberman, 1973; MacDonald & Gardner, 2000).

Assumptions of chi-square analysis were checked: (a) the observations within the cells are independent (each participant contributes data to only one cell), (b) the observations are measured as frequencies, and (c) no more than 20% of the cells have an expected frequency of less than 5 (Ary et al., 2002; Cronin, 1981). Likewise, assumptions of ANOVA were also checked for age at closure: (a) the observations are independent of each other, (b) the test variables are normally distributed, and (c) the variance of distribution of the test variables for a group to be compared is equal to one for the other group to be compared (Mertler & Vannatta, 2001).

CHAPTER 4

RESULTS

This chapter presents the results from the data analyses conducted to answer four research questions with relation to employment for individuals living with HIV/AIDS who participated in state/federal rehabilitation programs for the 2006 fiscal year. The primary goal of this study is to identify the predictive relationships of consumer characteristics and service variables upon vocational rehabilitation outcomes for VR consumers living with HIV/AIDS. Each research question was examined and its results follow in the following sections.

Research Question One

What are the socio-demographic characteristics at application, health variables, service-related variables, types of closure, and reasons for closure for participants with HIV/AIDS? This section provides descriptive statistics of the individuals with HIV/AIDS who used VR services in 2006. The RSA-911 data file included a total of 2,271 participants with HIV/AIDS who received services from state/federal vocational rehabilitation agencies during fiscal year 2006.

Age at Application, Gender, and Race/Ethnicity

Participants ranged in age from 18 to 69 when they applied to the VR program ($M = 41.16$; $SD = 7.789$). Of the 2,271, males accounted for 74.9 % ($n = 1,700$), while females were 24.2 % ($n = 549$). As presented in Table 1, African Americans represented 51.7% ($n = 1,174$) of the total number of participants followed by Whites, at 35.4% ($n = 803$) of the participants. Participants in other race/ethnicities accounted for slightly higher

than 10% of the participants: American Indians or Alaska natives of .8% (n = 19), Asian of .7% (n = 15), Native-Hawaiian or other Pacific Island of .3% (n = 6). Latino participants (n = 210) accounted for 9.2% of the participants. Lastly, individuals who reported more than one race group, but not Latino were .5% (n = 11).

Table 1

Race/Ethnicity

	n	%
White	803	35.4
African-American	1,174	51.7
American Indian or Alaska Native	19	.8
Asian	15	.7
Native Hawaiian or Other Pacific Island	6	.3
Multiple race group, not Latino	11	.5
Latino	210	9.2
Missing	33	1.5
Total	2,271	100.0

Level of Education at Application

Table 2 presents level of education at application. With respect to level of education at application, 20.3% (n = 460) of the participants had less than a high school education at application, whereas 37.4% (n = 849) had a high school degree or GED, and 23% (n = 522) had some post secondary education but no degree. Relatively small numbers of participants reported holding a higher education degree as only 8.2% (n = 186) of the participants had associate degree or vocational or technical certificate and 9.2% (n = 210) had a Bachelor's degree or higher degree. Lastly, of the 2,271 participants, .4% reported having a special education certificate.

Table 2

Level of Education at Application

	n	%
Less than high school	460	20.3
Special education certificate	8	.4
High school graduate or equiv. certificate	849	37.4
Post-secondary education but no degree	522	23.0
Associate degree or voc/tech certificate	186	8.2
Bachelor degree or above	210	9.2
Missing	36	1.6
Total	2,271	100.0

Employment Status, Hours Worked per Week, and Weekly Earnings at Application

Regarding employment status, Table 3 shows that most of the participants were not employed when they applied to the VR program. Of 2,271 participants, 84.1% (n = 1,909) were not employed and 4.8% (n = 110) and 1% (n = 23) were unemployed but in education. Approximately 6.6% of the participants (n = 151) were employed without supports in an integrated setting when they applied to the VR program. Working hours and weekly earnings reflect high rates of unemployment. Average hours worked per week at application was 2.12 (range 0 - 70, SD = 8.125) and average weekly earnings at application was \$20.25 (range \$0.00 – \$1,200.00, SD = \$86.245).

Table 3

Employment Status at Application

	n	%
Employment w/o supports in integrated setting	151	6.6
Extended employment	4	.2
Self-employment	5	.2
Homemaker	9	.4
Unpaid family worker	1	.0
Employment with supports in integrated setting	6	.3
Not employed student in secondary education	23	1.0
Not employed, all other students	110	4.8
Not employed, trainee, intern or volunteer	14	.6
Not employed , other	1,909	84.1
Missing	39	1.7
Total	2,271	100.0

Primary Source of Support and Living Arrangement at Application

More than half, or 64.3% (n = 1,460) of the participants reported public support as their primary source of support at application, whereas only 7.8% (n = 178) reported personal income as their primary source of support. Individuals whose primary source of income was family and friends accounted for 18.6% (n = 422) of the participants.

Regarding living arrangement at application (Table 4), the majority (83.4%, n = 1,893) of the participants had a private residence, whereas 4% (n = 91) cited a community residential or group home, 2.5% (n = 57) were homeless or stayed at a shelter, 2.4% (n = 55) stayed at a substance abuse treatment center, and 2.1% (n = 47) resided in a halfway house. Other types of living arrangement included rehabilitation facility (.9%, n = 20), adult correctional facility (.3%, n = 7), nursing home (.2%, n = 5), and mental health facility (.1%, n = 2).

Table 4

Living Arrangement

	n	%
Private Residence	1,893	83.4
Community Residential/Group Home	91	4.0
Rehabilitation Facility	20	.9
Mental Health Facility	2	.1
Nursing Home	5	.2
Adult Correctional Facility	7	.3
Halfway House	47	2.1
Substance Abuse Treatment Center	55	2.4
Homeless/ Shelter	57	2.5
Other	59	2.6
Missing	35	1.5
Total	2,271	100.0

Benefits and Medical Insurance Coverage at Application

Regarding receipt of public benefits, 28.6% (n = 649) and 37.1% (n = 827) of the participants reported receiving SSI and SSDI at application, respectively (Table 5). In relation to health insurance, 43.5% (n = 987) of the participants had Medicaid at application. Participants with Medicare at application accounted for 27.6% (n = 627) of the participants.

Table 5

Public Benefits at Application

	No		Yes		Missing	
	N	%	n	%	n	%
SSI	1,586	69.8	649	28.6	36	1.6
SSDI	1,400	61.6	827	36.4	44	1.9
Medicaid	1,281	56.4	987	43.5	3	.1
Medicare	1,641	72.3	627	27.6	3	.1

Note. Total N of the participants for each type of benefits are 2,271.

Health Variables

Table 6 presents a list of primary impairments caused by HIV/AIDS among the participants. Of a total of 19 different types of impairments reported in the RSA-911 data file, nine impairments that occurred most frequently are listed in the table. More than half (53.8%, n = 1,221) of the participants had general physical debilitation such as fatigue, weakness, and pain. Thirty eight percent (n = 885) of the participants reported having some types of physical impairments other than mobility orthopedic or neurological impairments, manipulation, dexterity orthopedic, and respiratory impairments. Participants who had psychosocial impairments accounted for 1.9% (n = 43) of the participants, followed by 1.1% with blindness; .9% with some types of mental impairments other than cognitive and psychosocial impairments; .8% (n = 19) with orthopedic or neurological impairments; .7% (n = 17) with cognitive impairments involving learning, thinking, processing information, and concentration; and .6% (n = 13) with respiratory impairments. All other participants (1.2%, n = 27) reported having some other types of sensory or communicative, physical, or mental impairments.

Table 6

Primary Impairments Caused by HIV/AIDS

	n	%
General physical debilitation	1,221	53.8
Other physical impairments	885	39.0
Psychosocial impairments	43	1.9
Blindness	25	1.1
Other mental impairments	21	.9
Mobility orthopedic/neurological impairments	19	.8
Respiratory impairments	13	.6
Cognitive impairments	17	.7
All others	27	1.2
Total	2,271	100.0

Of the 2,271 participants, 88.6 % (n = 2,012) reported having a significant disability, whereas only 6.6% (n = 151) of the participants did not have a significant disability. In relation to secondary impairment, more than half, or 59.9% (n = 1,360) reported having a secondary impairment including psychosocial impairment (n = 503, 22.2%), other physical impairments (n = 228, 10.0%), other mental impairments (n = 206, 9.1%), general physical debilitation (n = 110, 4.8%), and cognitive impairments (n = 105, 4.6%) (see Table 7).

Table 7

Secondary Impairment

	N	%
No secondary impairment	833	36.7
Psychosocial impairments	503	22.2
Other physical impairments	228	10.0
Other mental impairments	206	9.1
General physical debilitation	110	4.8
Cognitive impairments	105	4.6
Mobility orthopedic/neurological impairments	56	2.5
Other orthopedic impairments	46	2.0
All others	106	4.7
Missing	78	3.4
Total	2,271	100.0

Of a total of 36 different types of causes of secondary impairments reported in the RSA-911 data file, Table 8 presents the five most common causes of secondary impairments including depressive and other mood disorders (16.8%, n = 382), followed by drug abuse or dependence other than alcohol (10.1%, n = 230).

Table 8

Cause of Secondary Impairments

	n	%
No secondary impairment	833	36.7
Depressive & other mood disorders	382	16.8
Drug abuse or dependence other than alcohol	230	10.1
HIV/AIDS	114	5.0
Physical disorder	98	4.3
Accident/injury other than TBI or SCI	51	2.3
Cause unknown	53	2.3
All others	432	19.1
Missing	78	3.4
Total	2,271	100.0

Source of Referral

As reported in Table 9, the most likely referral source to the VR program was self-referral (33.7%, n = 765), followed by community rehabilitation programs (12.9%, n = 295) and physician or other medical personnel or institutions (10.5%, n = 239).

Approximately 4.9% (n = 111) were referred by the Social Security Administration and 2.2% (n = 50) were referred by one-stop employment training centers. Participants referred by post-secondary educational institutions made up 2.1% (n = 47) of the participants and those referred by state or local welfare agency accounted for 2% (n = 45) of the participants. Very few participants (.4%, n = 9) were referred by elementary or secondary educational institutions.

Table 9

Source of Referral

	n	%
Self-referral	765	33.7
Community rehabilitation programs	294	12.9
Physician or other medical personnel or institutions	239	10.5
Social Security Administration	111	4.9
One-stop employment/ training centers	50	2.2
Educational institutions (Post-secondary)	47	2.1
Welfare agency (state or local government)	45	2.0
Educational institutions (elementary or secondary)	9	.4
Other sources	710	31.3
Missing	1	.0
Total	2,271	100.0

Services, Length of Participation in the Program, and Costs of Purchased Services

Table 10 shows the types of case services most commonly provided to the participants with HIV/AIDS during the fiscal year 2006. The most common case service

was assessment (61.4%, n = 1,395), followed by vocational rehabilitation counseling and guidance (57.2%, n = 1,298). Approximately 35.3% (n = 801) received transportation services and 29.6% (n = 673) received diagnosis and treatment of impairments. On the other hand, fewer participants received services of job readiness training (7.9%, n = 180) and on the job supports (6.6%, n = 149). Participants received VR services for approximately 18 months in average (range 0 – 162, SD = 18.71) and mean costs of purchased services were approximately \$1,852.00 (range\$0.00 – \$64,860.00, SD = \$4,115.85).

Table 10

Services (N = 2,271)

	Yes		No	
	n	%	n	%
Assessment	1,395	61.4	876	38.6
Vocational rehabilitation counseling and guidance	1,298	57.2	973	42.8
Transportation	801	35.3	1,470	64.5
Diagnosis & treatment of impairments	673	29.6	1,598	70.4
Job placement assistance	467	20.6	1,804	79.4
Job search assistance	419	18.5	1,852	81.5
Information and referral	389	17.1	1,882	82.9
Occupational training	307	13.5	1,964	86.5
College training	246	10.8	2,025	89.2
Maintenance	238	10.5	2,033	89.5
Job readiness training	180	7.9	2,091	92.1
On the job supports	149	6.6	2,122	93.4

Types of Closure and Reasons for Closure

As presented in Table 11, participants were closed in different statuses. The highest number (31%, n = 704) of participants exited the program without employment

after their eligibility was determined, but before they signed their individualized plan for employment. Participants who exited the program without employment after receiving services accounted for 28.3% (n = 642), followed by 562 participants (24.7%) who exited the program with employment. Those who exited the program as an applicant made up 11.3% (n = 256) of the participants.

Table 11

Types of Closure

	n	%
Exited as an applicant	256	11.3
Exited during or after a trial work exp/ext evaluation	41	1.8
Exited from an order of selection waiting list	36	1.6
Exited w/o employment after eligibility before IPE signed	704	31.0
Exited w/o employment after signed IPE before services	30	1.3
Exited w/o employment after receiving services	642	28.3
Exited with an employment outcome	562	24.7
Total	2,271	100.0

As shown in Table 12, the most common reasons for closure were because the VR program could not locate or contact participants (25%, n = 57). Whereas 562 participants (24.7%) exited the program as they achieved employment, participants were also closed as failed to cooperate (18.8%, n = 426) or refused services or further services (12.2%, n = 277)

Table 12

Reasons for Closure

	n	Percent
Unable to locate or contact	567	25.0
Achieved employment outcome	562	24.7
Failure to cooperate	426	18.8
Refused services or further services	277	12.2
Disability too significant to benefit from VR services	47	2.1
No impediment to employment	20	.9
All other reasons	372	16.4
Total	2,271	100.0

Research Question Two

Are there statistically significant differences between participants with HIV/AIDS who exited the VR program with employment or without employment on socio-demographic characteristics at application and closure, health variables, and service-related variables? Chi-square analysis and independent t-tests were conducted to compare individuals with HIV/AIDS who exited the VR program with employment and without employment on socio-demographic characteristics, health variables, and service-related variables. Note that these analyses were exploratory with the aim to explore and potentially identify predictor variables to be entered into the logistic regression.

Of a total of 1,178 White, African American, and Latino participants who exited the VR program with or without employment, 46.6% (n = 549) obtained employment whereas 53.4% (n = 629) did not. Note that description of tables of chi-square statistics is limited to cells with standardized residuals exceeding ± 2 , which indicates observed frequencies are significantly different from expected frequencies.

Socio-Demographic Characteristics at Application

The result of a t-test revealed no significant difference in mean age at application between individuals who exited the program with employment (mean age of 40.94, SD = 7.645) and without employment (mean age of 41.17, SD = 7.755). Chi-square analysis showed that the two groups were also not significantly different based on gender as well as race/ethnicity. Of 1,178 participants, 45.9% (n = 425) of a total of 925 males were employed while 49% (n = 124) of a total of 253 female participants were employed. Of 471 White participants, 49.5% (n = 233) exited the program with employment, 44.4% (n = 257) of 579 African American consumers, and 46.1% (n = 59) of 128 Latino consumers exited the program with employment.

Level of education at application did not significantly differentiate between individuals with employment and without employment, although individuals with an associate degree or bachelor's degree were more likely to be employed than individuals with lower levels of education (except for special education) (see Table 13).

Table 13

Level of Education at Application

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Less than high school	91	43.5	118	56.5	209	100
Special education certificate	4	66.7	2	33.3	6	100
High school graduate or equivalent certificate	197	44.7	244	55.3	441	100
Post-secondary ed. but no degree	128	44.8	158	55.2	286	100
Associate degree or voc/tech cert.	56	54.9	46	45.1	102	100
Bachelor's degree or higher	73	54.5	61	45.5	134	100

Regarding employment status at application, Table 14 presents significant differences between individuals with employment and without employment when they exited the VR program ($\chi^2 = 27.684$, $p = .000$). Participants who exited the VR program with employment at closure were more likely to have some type of employment at application, which included employment without supports in integrated setting, self-employment, homemaker, and unpaid family worker.

Table 14

Employment Status at Application

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Employed	74	71.2	30	28.8	104	100.0
Unemployed, students, trainees, interns, or volunteers	40	45.5	48	54.5	88	100.0
Unemployed, other	435	44.1	551	55.9	986	100.0

Hours worked per week at application was different between employed participants and unemployed participants at closure ($t = 5.78$, $p = .000$). Participants who exited the VR program with employment demonstrated more working hours at application with average 3.87 hours per week ($SD = 10.769$) whereas those who exited the VR program without employment reported less working hours per week at application with average 1.16 hours per week ($SD = 5.725$). Likewise, weekly earning at application was higher among participants who exited the VR program with employment than those without employment ($t = 4.946$, $p = .000$). Average weekly earnings at application for participants with employment and without employment at closure was \$ 38.20 ($SD = 117.078$) and \$ 11.76 ($SD = 70.240$), respectively.

Primary source of support at application was significantly different between participants with employment and those without employment when they exited the VR program ($\chi^2 = 640.553$, $p = .000$). As presented in Table 15, participants who exited the VR program with employment were more likely to have support from personal income (65.0%, $n = 67$) or family and friends (54.6%, $n = 106$), but less likely to have public support (41.9%, $n = 328$) when they applied for services. Table 15 also presents living arrangement of the two groups. However, no significant difference between the two groups was found.

Table 15

Primary Source of Support and Living Arrangement at Application

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Primary source of support						
Personal income	67	65.0	36	35.0	103	100.0
Family & friends	106	54.6	88	45.4	194	100.0
Public support	328	41.9	454	58.1	782	100.0
All other sources	48	48.5	51	51.5	99	100.0
Living arrangement						
Private residence	483	47.7	529	52.3	1,012	100.0
Other	66	39.8	100	60.2	166	100.0

In regard to public benefits and medical insurance coverage at application, significant differences between employed participants and unemployed participants at closure was found based upon SSI ($\chi^2 = 7.077$, $p = .008$), SSDI ($\chi^2 = 8.459$, $p = .004$), Medicaid ($\chi^2 = 5.216$, $p = .022$), and Medicare ($\chi^2 = 4.306$, $p = .038$), respectively. As shown in Table 16, those who exited the VR program with employment were less likely to receive public benefits and Medicaid or Medicare.

Table 16

Receipt of Public Benefits at Application

		Employed		Unemployed		Total	
		n	%	n	%	n	%
SSI							
	Yes	132	40.4	195	59.6	327	100.0
	No	417	49.0	434	51.0	851	100.0
SSDI							
	Yes	191	41.3	271	58.7	462	100.0
	No	358	50.0	358	50.5	716	100.0
Medicaid							100.0
	Yes	216	42.8	289	57.2	505	100.0
	No	333	49.5	340	50.5	673	100.0
Medicare							
	Yes	141	41.8	196	58.2	337	100.0
	No	408	48.5	433	51.5	841	100.0

Health Variables

Chi-square analysis found no significant differences in primary impairments between employed participants and unemployed participants when they exited the VR program. As shown in Table 17, rates of general physical debilitation (54.1%, n = 331) and other physical impairments (52.2%, n = 247) were slightly higher among those without employment at closure.

Table 17

Primary Impairments Caused by HIV/AIDS

		Employed		Unemployed		Total	
		n	%	n	%	n	%
General physical debilitation		281	45.9	331	54.1	612	100.0
Other physical impairments		226	47.8	247	52.2	473	100.0
Psychosocial impairments		10	35.7	18	64.3	28	100.0
All others		32	49.2	33	50.8	65	100.0

Table 18 presents differences in secondary impairments and causes of secondary impairments between employed and unemployed participants at closure. Whether participants had secondary impairments was not found to be significantly different between employed and unemployed participants at closure, although unemployed participants at closure showed slightly higher rates of having secondary impairments. However, causes of secondary impairments differentiated between the two groups ($\chi^2 = 15.846, p = .027$). Employed participants at closure were more likely to have depressive and other mood disorders than expected, but less likely to have drug abuse or dependence other than alcohol.

Table 18

Secondary Impairments and Causes

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Secondary impairments						
No	207	48.7	218	51.3	425	100.0
Yes	342	45.4	411	54.6	753	100.0
Causes of secondary impairments						
No impairment	207	48.7	218	51.3	425	100.0
Depressive & other mood disorders	115	55.8	91	44.2	206	100.0
Drug abuse or dependence other than alcohol	45	42.9	60	57.1	105	100.0
HIV/AIDS	31	38.3	50	61.7	81	100.0
Physical disorder	21	42.0	29	58.0	50	100.0
Accident/injury other than TBI or SCI	14	51.9	13	48.1	27	100.0
Cause unknown	12	34.3	23	65.7	35	100.0
All others	104	41.8	145	58.2	249	100.0

Source of Referral, Received Services, Length of Participation, Costs of Purchased Services, and Reasons for Closure

Chi-square analysis revealed that source of referral significantly differentiated between employed and unemployed individuals when they exited the VR program ($\chi^2 = 16.267$, $p = .023$). As shown in Table 19, participants who exited the program with employment were more likely to be referred to the VR program by community rehabilitation programs. Although many of the participants were referred by resources other than listed in the Table 19 (other resources), the RSA manual (2006) does not specify what other sources refers to.

Table 19

Source of Referral

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Educational institutions	9	27.3	24	72.7	33	100.0
Physician or other medical personnel or institutions	50	43.9	64	56.1	114	100.0
Welfare agency (state or local government)	11	50.0	11	50.0	22	100.0
Community rehabilitation programs	97	57.1	73	42.9	170	100.0
Social Security Administration	24	40.0	36	60.0	60	100.0
One-stop employment/ training centers	15	57.7	11	42.3	26	100.0
Self-referral	173	47.1	194	52.9	367	100.0
Other sources	170	44.0	216	56.0	386	100.0

Table 20 presents findings of chi-square analyses conducted for each of the top 12 VR services that participants with HIV/AIDS received. Of the 12 VR services significant group differences were found in eight services as follows: VR counseling and guidance

$(\chi^2 = 4.302, p = .038)$, job readiness training $(\chi^2 = 36.237, p = .000)$, job search assistance $(\chi^2 = 132.965, p = .000)$, job placement assistance $(\chi^2 = 170.879, p = .000)$, on the job support $(\chi^2 = 63.553, p = .000)$, transportation services $(\chi^2 = 7.579, p = .006)$, maintenance $(\chi^2 = 29.304, p = .000)$, information & referral services $(\chi^2 = 7.489, p = .006)$. As shown in Table 19, participants with employment at closure were more likely to receive job readiness training (67.8%, $n = 116$), job search assistance (69.8%, $n = 282$), job placement assistance (70.6%, 320), on the job support (78.7%, 107), maintenance (63.3%, $n = 136$), and information and referral services (53.8%, $n = 147$). In addition, the rates of not being provided these services were lower among employed participants at closure.

Table 20

VR Services Received

	Employed		Unemployed		Total	
	n	%	n	%	n	%
Assessment						
Provided	386	44.9	473	55.1	859	100.0
Not provided	163	51.1	156	48.9	319	100.0
Diagnosis and treatment						
Provided	224	46.1	262	53.9	486	100.0
Not provided	325	47.0	367	53.0	692	100.0
VR counseling and guidance*						100.0
Provided	455	48.1	491	51.9	946	100.0
Not provided	94	40.5	138	59.5	232	100.0
College training						
Provided	100	42.6	135	57.4	235	100.0
Not provided	449	47.6	494	52.4	943	100.0
Occupational/vocational training						
Provided	126	42.1	173	57.9	299	100.0
Not provided	423	48.1	456	51.9	879	100.0
Job readiness training**						
Provided	116	67.8	55	32.2	171	100.0
Not provided	433	43.0	574	57.0	1,007	100.0
Job search assistance**						100.0
Provided	282	69.8	122	30.2	404	100.0
Not provided	267	34.5	507	65.5	774	100.0
Job placement assistance**						
Provided	320	70.6	133	29.4	453	100.0
Not provided	229	31.6	496	68.4	725	100.0
On the job support**						
Provided	107	78.7	29	21.3	136	100.0
Not provided	442	42.4	600	57.6	1,042	100.0
Transportation services**						
Provided	348	49.9	349	50.1	697	100.0
Not provided	201	41.8	280	58.2	481	100.0
Maintenance**						100.0
Provided	136	63.3	79	36.7	215	100.0
Not provided	413	42.9	550	57.1	963	100.0
Information & referral services**						
Provided	147	53.8	126	46.2	273	100.0
Not provided	402	44.4	503	55.6	905	100.0

Note. * $p < .05$, ** $< .01$

Length of participation in the VR program was not significantly different between employed and unemployed participants at closure ($t = -5.159$, $p = .111$). Individuals who exited the VR program with employment participated in the program for an average of 23 months ($SD = 20.020$), whereas those who exited the program without employment stayed with the program for an average of 29 months ($SD = 21.178$).

However, average cost of purchased services was found to be significantly different between the two groups ($t = 5.853$, $p = .000$). Average cost of purchased services for employed participants at closure was \$4,325.59 ($SD = \$5,862.213$), whereas for those without employment at closure it was \$2,577.81 ($SD = \$4,354.000$).

No chi-square analysis was conducted for reasons for closure as all of the participants with employment at closure exited the program as they achieved an employment outcome ($n = 549$). Reasons for closure for those who exited the program without employment varied, including loss of contact ($n = 246$), failure to cooperate ($n = 127$), refused services or further services ($n = 98$), disability too significant to benefit from VR services ($n = 25$), and all other reasons ($n = 133$).

Socio-Demographic Characteristics at Closure

The two groups were not different in mean age at closure as average age of consumers with employment and without employment were 42.93 years ($SD = 7.741$) and 43.65 years ($SD = 7.712$), respectively.

However, unlike at application, level of education at closure was shown to be significantly different between individuals with employment and without employment ($\chi^2 = 41.605$, $p = .000$). As presented in Table 21, individuals who exited the VR program

with employment were more likely to have an associate degree or voc/tech certification (61%, n = 94) or a bachelor's degree or higher (60.9%, n = 104), but less likely to have post-secondary education (no degree) (38.9%, n = 121).

Table 21

Level of Education at Closure

	Employed		Unemployed		Total	
	n	%	N	%	n	%
Less than high school	67	39.4	103	60.6	170	100.0
Special education certificate	4	80.0	1	20.0	4	100.0
High school graduate or equivalent certificate	160	43.4	209	56.6	369	100.0
Post-secondary ed. but no degree	121	38.9	190	61.1	311	100.0
Associate degree or voc/tech certificate	94	61.0	60	39.0	154	100.0
Bachelor's degree or higher	103	60.9	66	39.1	169	100.0

In relation to primary source of support at application, statistically significant differences between employed and unemployed individuals at closure were found ($\chi^2 = 640.553$, $p = .000$). As presented in Table 22, participants who exited the VR program with employment were more likely to report personal income as their primary support (91.1%, n = 440) whereas those who exited the program without employment were more likely to receive support from family and friends (92.9%, n = 92) or public support (79.9%, n = 401).

Table 22

Primary Source of Support at Closure

	Employed		Unemployed		Total	
	n	%	N	%	n	%
Personal income	440	91.1	43	8.9	483	100.0
Family & friends	7	7.1	92	92.9	99	100.0
Public support	101	20.1	401	79.9	502	100.0
All other sources	3	1.5	66	98.5	67	100.0

In regard to public benefits and medical insurance coverage at closure, chi-square analysis demonstrated significant differences between employed participants and unemployed participants at closure based upon SSI ($\chi^2 = 6.722$, $p = .010$), SSDI ($\chi^2 = 6.147$, $p = .013$), Medicaid ($\chi^2 = 8.623$, $p = .003$), and Medicare ($\chi^2 = 4.306$, $p = .038$), respectively. As presented in Table 23, those who exited the VR program with employment were less likely to receive public benefits at closure.

Table 23

Receipt of Public Benefits and Medical Insurance Coverage at Closure

	Employed		Unemployed		Total	
	n	%	n	%	n	%
SSI						
Yes	124	40.3	184	59.7	308	100.0
No	422	48.8	442	51.2	864	100.0
SSDI						
Yes	195	42.1	268	57.9	463	100.0
No	351	49.5	358	50.5	709	100.0
Medicaid						100.0
Yes	179	41.5	252	58.5	431	100.0
No	369	49.5	375	50.4	744	100.0
Medicare						
Yes	126	39.6	192	60.4	318	100.0
No	422	49.2	435	50.8	857	100.0

Research Question Three

Which variables predict an employment or unemployment outcome between participants with HIV/AIDS who exited the VR program with employment or without employment at closure? Using Group One and Group Two, binary logistic regression was conducted to determine how the 28 selected variables predicted employment status at closure (employed or unemployed) of VR consumers who exited the program with or without employment in the fiscal year 2006.

The results of the Hosmer and Lemeshow Test indicated the overall model fit of the 28 variables was statistically reliable in distinguishing between employed and unemployed status at closure in both Group One ($\chi^2 (8) = 7.088, p < .527$) and Group Two ($\chi^2 (8) = 7.778, p < .455$). The Nagelkerke R Square of .370 (Group One) and .448 (Group Two) showed that this logistic regression explained 37.0% and 44.8% of the variation in the outcome variable (employed) of Group One and Group Two, respectively.

As presented in the classification table (Table 24), the overall accuracy of the model to predict participants to be employed or unemployed at closure was 73.1% in Group One and 75.5% in Group Two. In Group One, the model correctly classified 79.3% of participants who were unemployed and 66% of participants who were employed at closure. In Group Two, the model correctly classified 78.3% of participants who were unemployed and 73.1% of participants who were employed at closure.

Table 24

Classification Table for Binary Logistic Regression Model for Group One and Group

Two

Observed			Predicted		
			Type of Closure		Percentage Correct
			Unemployed	Employed	
Group One	Type of Closure	Unemployed	237	62	79.3
		Employed	88	171	66.0
		Overall			73.1
		Percentage			
Group Two	Type of Closure	Unemployed	238	66	78.8
		Employed	70	190	73.1
		Overall			75.9
		Percentage			

Note. Constant is included in the model.

Regression coefficients of Group One and Group Two are presented in Table 25 and Table 26, respectively. In binary regression analysis, each of the categorical variables has a reference group to be compared with. Regarding dichotomous variables, a reference group is one in an opposite position (yes vs. no). For example, a reference group of gender (male) and race (White) is female and non-White, respectively. In regards to variables with more than two categories, each category was compared to a reference category group, which is indicated with 'ref.' in Table 25 and 26 (e.g., Education at closure ≤ 12).

As shown in Table 25, in Group One, of the 28 variables entered into the regression, 10 variables significantly contributed to the explanatory power of the model. These 10 variables included: (a) job search assistance, (b) job placement assistance, (c) on the job supports, (d) maintenance, (e) information and referral service, (f) all of the

three categories of length of participation in the program, and (g) two categories of cost of purchased services (\$2,000.00 - \$4,999.00 and \$5,000.00 or higher).

Table 25

Binary Logistic Regression Coefficients of Group One

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender (male)	-.276	.252	1.197	1	.274	.759
Race (White)	-.018	.226	.007	1	.935	.982
No public benefits ^a	.396	.255	2.408	1	.121	1.487
Depressive or mood disorders	.422	.290	2.118	1	.146	1.526
Source of referral (CRPOETC) ^b	.079	.303	.068	1	.794	1.083
VR counseling and guidance	.319	.264	1.462	1	.227	1.375
Job readiness assistance	.650	.335	3.772	1	.052	1.916
Job search assistance*	.674	.272	6.158	1	.013	1.962
Job placement**	1.042	.260	16.040	1	.000	2.835
On the job supports**	1.527	.363	17.704	1	.000	4.606
Transportation	-.342	.228	2.259	1	.133	.710
Maintenance*	.699	.284	6.070	1	.014	2.013
Information & referral *	-.597	.278	4.607	1	.032	.551
Participation: < 1 year (ref.)			14.321	3	.002	
≥ 1 year, < 2 years*	-.646	.279	5.362	1	.021	.524
≥ 2 years, < 3 years*	-.637	.317	4.044	1	.044	.529
≥ 3 years**	-1.253	.333	14.127	1	.000	.286
Cost of services: < \$500.00(ref.)			14.695	3	.002	
\$500.00- \$1,999.00	.369	.299	1.523	1	.217	1.447
\$2,000.00 - \$4,999.00**	.732	.284	6.626	1	.010	2.079
\$5,000.00 or higher**	1.260	.347	13.174	1	.000	3.527
Age at closure	-.010	.014	.529	1	.467	.990
SSI at closure	.079	.279	.079	1	.778	1.082
SSDI at closure	-.119	.266	.202	1	.653	.887
Medicaid at closure	-.233	.245	.906	1	.341	.792
Medicare at closure	.163	.282	.337	1	.562	1.178
Education at closure ≤ 12 (ref.)			5.530	4	.237	
Education: = 12	-.035	.342	.011	1	.918	.965
Education: >12 but ≤ 14	-.203	.368	.304	1	.582	.817
Education: = 14	.443	.415	1.139	1	.286	1.558
Education: ≥ 16	.436	.438	.991	1	.319	1.546
Constant	-.551	.731	.568	1	.451	.577

*<.05, **<.01, Ref. = reference category, ^a: No public benefits as primary source of support at application, ^b: CRPOETC: community rehabilitation programs or one-stop employment/training centers.

As presented in Table 26, in Group Two, a total of 11 variables were found to significantly contribute to the explanatory power of the model, including (a) primary support at application, (b) job search assistance, (c) job placement, (d) on the job supports, (e) all of the three categories of length of participation in the program, and (g) two categories of cost of purchased services (\$2,000.00 - \$4,999.00 and \$5,000.00 or higher), and Medicare at closure, and education (associate degree).

Table 26

Binary Logistic Regression Coefficients of Group Two

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-.456	.274	2.777	1	.096	.634
Race (White)	.127	.238	.284	1	.594	1.135
No public benefits ^a **	1.054	.280	14.134	1	.000	2.870
Depressive or mood disorders	.473	.285	2.755	1	.097	1.604
Source of referral (CRPOETC) ^b	-.311	.318	.951	1	.329	.733
VR counseling and guidance	-.101	.305	.110	1	.740	.904
Job readiness assistance	.415	.336	1.525	1	.217	1.514
Job search assistance**	.971	.296	10.716	1	.001	2.639
Job placement**	1.067	.269	15.699	1	.000	2.907
On the job supports**	1.155	.383	9.103	1	.003	3.173
Transportation	-.131	.238	.304	1	.581	.877
Maintenance	.241	.305	.627	1	.428	1.273
Info. & referral	.110	.273	.163	1	.686	1.116
Participation: < 1 year (ref.)			27.629	3	.000	
≥ 1 year, < 2 years*	-.635	.282	5.063	1	.024	.530
≥ 2 years, < 3 years*	-1.495	.347	18.549	1	.000	.224
≥ 3 years**	-1.618	.354	20.900	1	.000	.198
Cost of services: < \$500.00(ref.)			26.564	3	.000	
\$500.00 - \$1,999.00	.050	.302	.028	1	.868	1.051
\$2,000.00 - \$4,999.00**	1.041	.301	11.969	1	.001	2.833
\$5,000.00 or higher**	1.558	.364	18.359	1	.000	4.749
Age at closure	-.005	.014	.110	1	.740	.995
SSI at closure	-.231	.271	.722	1	.395	.794
SSDI at closure	.512	.283	3.263	1	.071	1.668
Medicaid at closure	.127	.246	.266	1	.606	1.135
Medicare at closure*	-.863	.290	8.866	1	.003	.422
Education at closure ≤ 12 (ref.)			13.682	4	.008	
Education: = 12	.333	.337	.977	1	.323	1.396
Education: >12 but ≤ 14	.478	.347	1.895	1	.169	1.613
Education: = 14**	1.500	.433	12.000	1	.001	4.481
Education: ≥ 16	.828	.428	3.742	1	.053	2.290
Constant	-1.063	.740	2.066	1	.151	.345

Note. *<.05, **<.01, Ref. = reference category, ^a: No public benefits as primary source of support at application, ^b: CRPOETC: community rehabilitation programs or one-stop employment/training centers.

Table 27 presents eight variables that were found to be significant in both Group One and Group Two. The eight variables included three services (job search assistance, job placement assistance, and on the job supports), length of participation in the program (one year or longer but less than 2 years; 2 years or longer, but less than 3 years; 3 years or longer), and cost of purchased services (\$2,000.00 - \$4,999.00; \$5,000.00 or higher).

First, regarding service variables, job search assistance was significantly related to employment (Wald = 6.158, $p = .013$ in Group One, Wald = 10.716, $p = .011$ in Group Two). The Exp (B) value of 1.962 in Group One (95% Confidence Interval = 1.152 to 3.342) suggested that participants who received job search assistance in Group One were approximately twice more likely to be employed at closure than those who did not receive the job search assistance. Likewise, the Exp (B) value of 2.639 in Group Two (95% Confidence Interval = 1.476 to 4.719) indicated that participants who received job search assistance in Group Two were more than twice more likely to be employed at closure than those who did not receive the job search assistance.

Job placement assistance also significantly predicated employment status (Wald = 16.040, $p = .000$ in Group One, and Wald = 15.699, $p = .000$ in Group Two). As participants received job placement assistance, their employment likelihood increased by approximately three times both in Group One (Exp (B) = 2.835, 95% CI = 1.703 to 4.722) and Group Two (Exp (B) = 2.907, 95% CI = 1.715 to 4.929). Similarly, on the job supports was significantly related to employment in both Group One (Wald = 17.704, $p = .000$) and Group Two (Wald = 9.103, $p = .003$). The value of Exp (B) suggested the odds of employment of participants who received on the job supports increased by more

than four times than those who did not receive the service in Group One (Exp (B) = 4.606, 95% CI = 2.261 to 9.382) and approximately three times in Group Two (Exp (B) = 3.173, 95% CI = 1.499 to 6.716).

Table 27

Binary Logistic Regression Coefficients of Significant Predictors of Employment in both Group One and Group Two

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Job search assistance						
Group One*	.674	.272	6.158	1	.013	1.962
Group Two**	.971	.296	10.716	1	.001	2.639
Job placement						
Group One**	1.042	.260	16.040	1	.000	2.835
Group Two**	1.067	.269	15.699	1	.000	2.907
On the job supports**						
Group One**	1.527	.363	17.704	1	.000	4.606
Group Two**	1.155	.383	9.103	1	.003	3.173
Participation: < 1 year (ref.)						
Group One: ≥ 1 year, < 2 years*	-.646	.279	5.362	1	.021	.524
≥ 2 years, < 3 years*	-.637	.317	4.044	1	.044	.529
≥ 3 years**	-1.253	.333	14.127	1	.000	.286
Group Two: ≥ 1 year, < 2 years*	-.635	.282	5.063	1	.024	.530
≥ 2 years, < 3 years*	-1.495	.347	18.549	1	.000	.224
≥ 3 years**	-1.618	.354	20.900	1	.000	.198
Cost of services: < \$500(ref.)						
Group One: \$2,000. - \$4,999.**	.732	.284	6.626	1	.010	2.079
\$5,000. or higher**	1.260	.347	13.174	1	.000	3.527
Group Two: \$2,000. - \$4,999.**	1.041	.301	11.969	1	.001	2.833
\$5,000. or higher**	1.558	.364	18.359	1	.000	4.749

Note. *<.05, **<.01

Length of participation in the program was significantly related to employment in both Group One and Group Two. Compared to people who participated in the program for less than a year, participants who stayed in the program for a year or longer but less than 2 years (Wald = 5.362, p = .021 in Group One, Wald = 5.063, p = .024 in Group

Two) were twice less likely to be employed at closure both in Group One (Exp (B) = .524, 95% CI = .303 to .906) and Group Two (Exp (B) = .530, 95% CI = .305 to .921).

Likewise, staying in the program for 2 years or longer but less than 3 years was significantly related to employment (Wald = 4.044, $p = .044$ in Group One, Wald = 18.549, $p = .000$ in Group Two). The Exp (B) value (.529, 95% CI = .284 to .984 in Group One; .224, 95% CI = .114 to .443 in Group Two) indicated that as participants stayed in the program approximately two years longer than those who stayed less than a year, the likelihood of being employed at closure decreased. Participation in the program for longer than 3 years was also significantly related to employment status at closure (Wald = 14.044, $p = .000$ in Group One, Wald = 20.900, $p = .000$ in Group Two). Exp (B) values again suggested that participating in the program longer than 3 years decreased the likelihood of employment at closure, compared to participation less than a year, by .286 (95% CI = .149 to .549) in Group One and .198 (95% CI = .099 to .397) in Group Two.

Cost of purchased services was significantly related to employment in both Group One and Group Two. Specifically, costs of purchased services ranged between \$2,000 and \$4,999 were positively and significantly related to employment (Wald = 6.626, $p = .010$ in Group One; Wald = 11.969, $p = .001$ in Group Two). As odds ratio presented (Exp (B) = 2.079, 95% CI = 1.191 to 3.631 in Group One; 2.833, 95% CI = 1.571 to 5.112 in Group Two), participants for whom equal to or more than \$2,000., but less than \$5,000.00 were spent to purchase services were approximately two times more likely to be employed than those for whom less than \$500.00 were spent. Likewise, costs of

purchased services of \$5,000.00 or higher were significantly related to employment. Again, as odds ratio presented (Exp (B) = 3.527, 95% CI = 1.786 to 6.965 in Group One; Exp (B) = 4.749, 95% CI = 2.329 to 9.684 in Group Two), participants for whom \$5,000.00 or higher amount of money were spent to purchase services were more than three times (Group One) or four times (Group Two) more likely to be employed than those for whom less than \$500.00 were spent.

Besides the eight variables found to be significant in both Group One and Group Two, five variables were also found to significantly predict membership of employment; however, the findings were questionable as they showed inconsistent results between Group One and Group Two. These five variables included two service variables that were found to be significant only in Group One (maintenance and information and referral services) and three variables that were significant only in Group Two (no public benefits as primary source of support, Medicare at closure, and holding associate degree at closure). Specifically, maintenance (Wald = 6.070, $p = .014$) and information and referral services (Wald = 4.607, $p = .032$) were significantly related to employment at closure only in Group One (see Table 25). The odds ratio (Exp (B) = 2.013, 95% CI = 1.786 to 6.965) showed that participants who received maintenance service were two times more likely to be employed at closure than those who did not receive it. However, participants who received information and referral services were less likely to be employed at closure than those who did not received it (Exp (B) = .551, 95% CI = .319 to .949).

As shown in Table 26, no public benefit as primary source of support at application (named as “no public benefits”; Wald = 14.134, $p = .000$), Medicare at

closure (Wald = 8.866, $p = .003$), and associate degree (Wald = 12.000, $p = .001$) were significantly related employment at closure only in Group Two. Participants whose primary source of support at application was not public benefits were approximately three times more likely to be employment at closure than participants whose primary source of support was public benefits (Exp (B) = 2.870, 95% CI = 1.650 to 4.971). Likewise, the odds ratios (Exp (B) = .422, 95% CI = .239 to .745) indicated that participants who received Medicare at closure were less likely to be employed at closure compared to those who did not receive it. Of the three different levels of education, the likelihood of being employed at closure was approximately four times higher among participants with an associate degree compared to participants with less than a high school education (Exp (B) = 4.481, 95% CI = 1.918 to 10.470).

All other variables did not significantly contribute to the explanatory power of the model either in Group One or Group Two. These variables were gender, race (White), having depressive or other mood disorders, being referred by community rehabilitation agencies or one-stop employment training/centers, VR counseling and guidance, job readiness assistance, cost of purchased services (\$500.00 - \$1,999.00), age at closure, SSI and SSDI at closure, Medicaid at closure, education at closure (high school diploma, some post-secondary education, and bachelor's degree or higher).

Research Question Four

Research Question Four (a)

In regard to research question four (a) - what are employment status, hours worked per week and weekly earning, and types of occupation at closure among

participants who exited the VR program with an employment outcome?, descriptive information was provided on employment status, weekly earnings and hours worked at closure, and occupation. Among those who exited the VR program with an employment outcome (n = 549), 91.6% (n = 503) had employment without supports in an integrated setting and 4.9% (n = 27) had employment with supports in an integrated setting.

Approximately 1.8% (n = 10) of the 549 participants were self-employed and 1.6% (n = 9) were a homemaker. Note that the RSA data considered participants who were closed being a homemaker as obtaining an employment outcome with no weekly earnings, but not as competitive employment.

Descriptive statistics showed that average weekly earnings at closure was \$385.88 (range \$0.00-\$4,000.00, SD = \$308.08) and average hours worked per week at closure were 30.9 (range 0 – 60, SD = 10.879). Table 28 presents 549 participants' weekly earnings in categories: 25.3% (n = 139) with less than \$200.00, 21.1% (n = 116) with equal to or higher than \$200.00 but less than \$300.00, 28.1% (n = 154) with equal to or higher than \$300.00 but less than \$500.00, and 25.5% (n = 140) with equal to or higher than \$500. Among participants whose weekly earnings were higher than \$500.00, one participant reported \$4,000.00 of weekly earnings, followed by one participant at \$2,325.00, 14 participants (between \$1,000.00 and \$1,800.00), 8 participants (between \$900.00 and \$998.00), 17 participants (between \$800.00 and \$895.00), 23 participants (between \$700.00 and \$795.00), 39 participants (between \$600.00 and \$694.00), and 37 participants (between \$500.00 and \$598.00).

Table 28

Weekly Earnings at Closure

Weekly earnings	N	%	Cumulative %
<\$200.00	139	25.3	25.3
≥\$200.00 - <\$300.00	116	21.1	46.4
≥\$300.00 - <\$500.00	154	28.1	74.5
≥\$500.00	140	25.5	100.0
Total	549	100.0	

Table 29 presents types of occupation of the participants with employment. Of a total of 549 participants who exited the VR program with an employment outcome at closure, 35.7% (n = 196) had professional, technical, and managerial occupations followed by 23.3% (n = 128) with clerical or sales occupations, and 20.2% (n = 111) with service occupations. Miscellaneous occupations (10.7%, n = 59) included occupations in motor freight, transportation, packaging and materials handling, graphic art work, and motion picture, television, and theatrical productions.

Table 29

Occupations at Closure

Occupations	n	%
Professional, technical, and managerial occupations	196	35.7
Clerical and sales occupations	128	23.3
Service occupations	111	20.2
Agricultural, fishery, forestry, and related occupations	6	1.1
Processing occupations	19	3.5
Machine trades occupations	7	1.3
Benchwork occupations	6	1.1
Structural work occupations	17	3.1
Miscellaneous occupations	59	10.7
Total	549	100.0

Research Question Four (b)

Regarding research question four (b) - do length of participation and cost of purchased services vary with number of services received?, both cost of purchased services ($\chi^2 = 58.425$, $p = .000$) and length of participation ($\chi^2 = 17.717$, $p = .039$) were significantly different based on the number of services received. As shown in Table 30, participants for whom less than \$500.00 was spent to purchase services were more likely to receive less than four services (35.5%, $n = 38$), but less likely to receive equal to or more than eight services (3.8%, $n = 5$). On the other hand, those whose cost of purchased services was \$5,000.00 or higher were less likely to receive less than four services (9.4%, $n = 10$), but more likely to receive eight or more services (40.8%, $n = 53$).

Table 30

Cost of Purchased Services based on the Number of Services Received

Number of services	Cost of purchased services							
	<\$500.00		\geq \$500.00 - <\$2,000.00		\geq \$2,000.00- <\$5,000.00		\geq \$5,000.00	
	n	%	n	%	n	%	n	%
<4 services	38	35.5	26	24.5	32	30.2	10	9.4
4 - 5 services	34	20.6	38	23.0	55	33.3	38	23.0
6 - 7 services	29	19.6	28	18.9	50	33.8	41	27.7
\geq 8 services	5	3.8	21	16.2	51	39.2	53	40.8
Total	106	19.3	113	20.6	188	34.2	142	25.9

Note. <4 services ($n = 106$), 4 – 5 services ($n = 165$), 6 – 7 services ($n = 148$), \geq 8 services ($n = 130$).

Regarding length of participation in relation to the number of services, participants who participated in the program less than a year were more likely to receive less than four services (43.4%, $n = 46$), whereas those who participated in the program

for equal to or longer than 3 years were less likely to receive less than four services (10.4%, n = 11) (see Table 31).

Table 31

Length of Participation based on the Number of Services Received

Number of services	Length of participation							
	<1 year		≥ 1 yr <2 yrs.		≥ 2 yrs. <3 yrs.		≥ 3 yrs.	
	N	%	n	%	n	%	n	%
<4 services	46	43.4	33	31.1	16	15.1	11	10.4
4 - 5 services	50	30.3	59	35.8	29	17.6	27	16.4
6 - 7 services	42	28.4	57	38.5	20	13.5	29	19.6
≥ 8 services	38	29.2	34	26.2	28	21.5	30	23.1
Total	176	32.1	183	33.3	93	16.9	97	17.7

Note. <4 services (n = 106), 4 – 5 services (n = 165), 6 – 7 services (n = 148), ≥ 8 services (n = 130).

Cost of purchased services was additionally examined, and found to be significantly different based on the length of participation in the program ($\chi^2 = 82.106$, $p = .000$). As shown in Table 32, participants whose cost of purchased services were equal to or higher than \$500.00 but less than \$2,000.00 were less likely to stay in the program for three years or longer (9.3%). In contrast, those whose costs of purchased service were more than \$5,000.00 were more likely participated in the program for three years or longer (54.6%), but less likely to be in the program less than a year (6.8%).

Table 32

Cost of Purchased Services based on Length of Participation

Length	Cost							
	<\$500.00		≥\$500.00 - <\$2,000.00		≥\$2,000.00 - <\$5,000.00		≥\$5,000.00	
	N	%	n	%	n	%	n	%
<1 year	45	25.6	52	29.5	67	38.1	12	6.8
≥1 yr. - <2 yrs.	31	16.9	36	19.7	69	37.7	47	25.7
≥2 yrs. - <3 yrs.	16	17.2	16	17.2	31	33.3	30	32.3
≥3 yrs.	14	14.4	9	9.3	21	21.6	53	54.6
Total	106	19.3	113	20.6	188	34.2	142	29.5

Note. <1 year (n = 176), ≥1 yr. - <2 yrs. (n = 183), ≥2 yrs. - <3 yrs. (n = 93), ≥3 yrs. (n = 97)

Research Question Four (c)

Regarding research question four(c) - are there statistically significant differences in weekly earnings based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics?, Table 33 presents weekly earnings based on cost of purchased services, length of participation, and the number of services received. Significant differences were found in weekly earnings based on the number of services ($\chi^2 = 39.167$, $p = .000$), but cost of purchased services and length of program participation. Regarding weekly earnings in relation to number of services, participants whose weekly earnings were less than \$200.00 were more likely to receive less than four services (34.9%, $n = 37$), but less likely to receive equal to or higher than eight services (16.2%, $n = 21$). In contrast, participants whose weekly earning was equal to or higher than \$500.00 were less likely to receive less than four services (12.3%, $n = 13$), but more likely to receive equal to or higher than eight services (39.2%, $n = 51$).

Table 33

Weekly Earnings based on the Number of Services Received

	Weekly earnings							
	<\$200.00		≥\$200.00 - <\$300.00		≥\$300.00 – <\$500.00		≥\$500.00	
	n	%	n	%	n	%	n	%
Number of services								
<4 services	37	34.9	26	24.5	30	28.3	13	12.3
4 - 5 services	43	26.1	48	29.1	37	22.4	37	22.4
6 - 7 services	38	25.7	24	16.2	47	31.8	39	26.4
≥8 services	21	16.2	18	13.8	40	30.8	51	39.2
Length								
<1 year	48	27.3	41	23.3	50	28.4	37	21.0
≥1 yr. - <2 yrs.	50	27.3	41	22.4	49	26.8	43	23.5
≥2 yrs. - <3 yrs.	21	22.6	15	16.1	33	35.5	24	25.8
≥3 yrs.	20	20.6	19	19.6	22	22.7	36	37.1
Cost								
<\$500.00	30	28.3	25	23.6	32	30.2	19	17.9
≥\$500.00 - <\$2,000.00	30	26.5	29	25.7	31	27.4	23	20.4
≥\$2,000.00 - <\$5,000.00	41	21.8	36	19.1	57	30.3	54	28.7
≥\$5,000.00	38	26.8	26	18.3	34	23.9	44	31.0

Note. <\$200.00 (25.3%, n = 139), ≥\$200.00 - <\$300.00 (21.1%, n = 116), ≥\$300.00 - <\$500.00 (28.1%, n = 154), and ≥\$500.00 (25.5%, n = 140).

Weekly earnings were significantly different in relation to receipt of the following seven services: assessment ($\chi^2 = 10.859$, $p = .013$), VR counseling and guidance ($\chi^2 = 18.434$, $p = .000$), college or university training ($\chi^2 = 30.162$, $p = .000$), job search assistance ($\chi^2 = 12.630$, $p = .006$), transportation ($\chi^2 = 10.844$, $p = .013$), maintenance ($\chi^2 = 8.891$, $p = .031$), and information and referral services ($\chi^2 = 21.824$, $p = .000$) (see Table 34). Specifically, a relatively fewer number of participants with weekly earnings higher than \$500.00 did not receive assessment (17.2%), vocational counseling and

guidance (12.8%), job search assistance (19.9%), and information and referral services (20.6%) . Also, they were more likely to receive college training (46.0%), job search assistance (30.9%), and information and referral services (38.8%).

Participants with weekly earnings less than \$200.00 were less likely to receive college or university training (10.8%), transportation (22.1%), maintenance (20.6%), and information and referral services (15.6%), and more likely not to receive transportation services (30.8%). In addition, participants with weekly earnings equal to or more than \$200.00 but less than \$300.00 were more likely not to receive vocational counseling and guidance (30.9%) and less likely to receive college training (12.6%) and maintenance services (15.4%).

However, weekly earnings were not found to be significantly different in relation to services including diagnosis and treatment, occupational and vocational training, job readiness training, job placement assistance, and on the job supports.

Table 34

Weekly Earnings based on Services Received

Services	Weekly earnings							
	<\$200.00		≥\$200.00 - <\$300.00		≥\$300.00 - <\$500.00		≥\$500.00	
	n	%	n	%	n	%	n	%
Assessment								
Not received	46	28.2	44	27.0	45	27.6	28	17.2
Received	93	24.1	72	18.7	109	28.2	112	29.0
VR counseling & guidance								
Not received	33	35.1	29	30.9	20	21.3	12	12.8
Received	106	23.3	87	19.1	134	29.5	128	28.1
College training								
Not received	124	27.6	104	23.2	127	28.3	94	20.9
Received	15	15.0	12	12.0	27	27.0	46	46.0
Job search assistance								
Not received	79	29.6	64	24.0	71	26.6	53	19.9
Received	60	21.3	52	18.4	83	29.4	87	30.9
Transportation								
Not received	62	30.8	49	24.4	51	25.4	39	19.4
Received	77	22.1	67	19.3	103	29.6	101	29.9
Maintenance								
Not received	111	26.9	95	23.0	105	25.4	102	24.7
Received	28	20.6	21	15.4	49	36.0	38	27.9
Information & referral services								
Not received	116	28.9	87	21.6	116	28.9	83	20.6
Received	23	15.6	29	19.7	38	25.9	57	38.8

Weekly earnings were significantly different in relation to some individual characteristics including race ($\chi^2 = 25.374$, $p = .000$), education at closure ($\chi^2 = 55.267$, $p = .000$), occupation at closure ($\chi^2 = 1.005E2$, $p = .000$), SSI ($\chi^2 = 15.655$, $p = .001$), SSDI ($\chi^2 = 24.267$, $p = .000$), Medicaid ($\chi^2 = 27.670$, $p = .000$), and Medicare ($\chi^2 = 47.362$, $p = .000$).

= .000); however, no significant differences in weekly earnings were found in age, gender, and cause of secondary impairments.

Regarding race, as presented in Table 35, White participants were more likely to earn equal to or higher than \$500.00 per week (33.0%), whereas African American participants were less likely to earn equal to or higher than \$500.00 per week (16.3%).

Table 35

Weekly Earnings based on Race

Race	Weekly earnings							
	<\$200.00		≥\$200.00 - <\$300.00		≥\$300.00 - <\$500.00		≥\$500.00	
	n	%	n	%	n	%	n	%
White	52	22.3	45	19.3	59	25.3	77	33.0
African American	79	30.7	60	23.3	76	29.6	42	16.3
Latino	8	13.6	11	18.6	19	32.2	21	35.6

Weekly earnings were different based on education. As presented in Table 36, participants with lower than a higher school (11.3%) or a high school diploma (14.4%) were less likely to earn equal to or higher than \$500.00 per week. In contrast, those with a bachelor degree or higher degree were more likely to earn equal to or higher than \$500.00 (46.6%), but less likely earn less than \$300.00 per week.

Table 36

Weekly Earnings based on Education at Closure

Education	Weekly earnings							
	<\$200.00		≥\$200.00		≥\$300.00		≥\$500.00	
			- <\$300.00		- <\$500.00			
	n	%	n	%	n	%	n	%
<12 or special ed.	24	33.8	19	26.8	20	28.3	8	11.3
=12 or equivalent	47	29.4	46	28.8	44	27.5	23	14.4
≥12 - < 14.	35	28.9	17	14.0	34	28.1	35	28.9
=14 or vocational or technical certificate	16	17.0	22	23.4	30	31.9	26	27.7
≥16	17	16.5	12	11.7	26	25.2	48	46.6

Weekly earnings were also significantly different based on type of occupation (see Table 37). Participants with service occupations were less likely to earn equal to or higher than \$500.00 (2.5%, n = 3). Similarly, participants with clerical and sales occupations were less likely to earn equal to or higher than \$500.00 (14.1%) but more likely earn less than \$200.00 (36.7%). In contrast, participants with professional, technical, or managerial occupations were more likely earn equal to or higher than \$500.00 (46.9%), but less likely earn less than \$200.00 (12.2%) or equal to or higher than \$200.00 but less than \$300.00 (13.8).

Table 37

Weekly Earnings based on Occupations

Occupation	Weekly earnings							
	<\$200.00		≥\$200.00		≥\$300.00		≥\$500.00	
			- <\$300.00		- <\$500.00			
	n	%	n	%	n	%	n	%
Service occupations	34	30.6	34	30.6	40	36	3	2.7
Clerical and sales	47	36.7	28	21.9	35	27.3	18	14.1
Professional, technical, & Managerial occupations	24	12.2	27	13.8	53	27.0	92	46.9
All others	34	29.8	27	23.7	26	22.8	27	23.7

Note. Service occupations (n = 111), clerical and sales occupations (n = 128), professional, technical, and managerial occupations (n = 196), and all others (n = 114).

Lastly, Table 38 presents weekly earnings based on public benefits and medical insurance coverage. Specifically, participants with weekly earnings less than \$200.00 were more likely to receive SSI (34.7%), SSDI (36.9%), Medicaid (34.6%), and Medicare (47.6%), whereas those with weekly earnings equal to or higher than \$500.00 were less likely to receive SSI (12.9%), Medicaid (13.4%), and Medicare (15.1%). In addition, those with weekly earnings equal to or higher than \$300.00, but less than \$500.00 were less likely to receive SSDI (19.5%) and Medicare (16.7%).

Table 38

Weekly Earnings based on Public Benefits and Medical Insurance

	Weekly earnings							
	<\$200.00		≥\$200.00 - <\$300.00		≥\$300.00 - <\$500.00		≥\$500.00	
	n	%	n	%	n	%	n	%
SSI								
Not received	96	22.7	88	20.9	115	27.3	123	29.1
Received	43	34.7	28	22.6	37	29.8	16	12.9
SSDI								
Not received	67	19.1	75	21.4	114	32.5	95	27.1
Received	72	36.9	41	21.0	38	19.5	44	22.6
Medicaid								
Not received	76	20.6	70	19.0	107	29.0	116	31.4
Received	62	34.6	46	25.7	47	26.3	24	13.4
Medicare								
Not received	78	18.5	90	21.3	133	31.5	121	28.7
Received	60	47.6	26	20.6	21	16.7	19	15.1

Conclusively, this study found that job search assistance, job placement, and on the job supports were found to be significant predictors of successful employment outcomes for VR consumers living with HIV/AIDS. In addition to the three VR service variables, cost of purchased services and length of participation in the VR program were also found to be significantly related to employment outcomes. Whereas an increase of costs of purchased services were significantly related to successful employment outcomes, an increase of length of program participation decreased the likelihood of successful employment.

Among participants with successful employment outcomes at closure (n = 549), 91.6% (n = 503) had employment without supports in an integrated setting. Average weekly earnings and hours worked per week at closure were \$385.88 and 30.9,

respectively. Major differences were found between participants earning less than \$200.00 per week and participants earning equal to or more than \$500.00 per week. Participants with less than \$200.00 of weekly earnings were more likely to be African American, to have levels of education lower than an associate degree at closure, to have service occupations or clerical and sales occupations, and to receive SSI, SSDI, Medicaid, and Medicare. On the other hand, participant with equal to or more than \$500.00 weekly earnings were more likely to be White, to have education levels of higher than an associate degree, and to have professional and managerial occupations, and they were less likely to receive SSI, SSDI, Medicaid, and Medicare. In addition, whereas participants with equal to or more than \$500.00 of weekly earnings were more likely to receive assessment, VR counseling and guidance, college or university training, job search assistance, transportation, maintenance, and information and referral services, those with less than \$200.00 weekly earnings were less likely to receive those VR services.

CHAPTER 5

DISCUSSION

The purpose of this study was to identify predictors of employment outcomes of individuals living with HIV/AIDS, who used the state/federal vocational rehabilitation (VR) program services, using the RSA 911 data file from Fiscal Year 2006. This chapter includes four sections: (a) integration of the study findings with past literature and discussion, (b) implication for practice, and (c) limitations and recommendations for future research.

Integration of the Study Findings with Past Literature and Discussion

The total participants in this study were individuals living with HIV/AIDS, who exited the state/federal VR program in 2006 (N = 2,271), obtained from the Rehabilitation Services Administration data file (RSA-911) for fiscal year 2006.

Research Question One

Descriptive data showed characteristics of participants with HIV/AIDS who were referred to the state/federal VR program at some time in or before 2006 (year of application ranged from 1992 to 2006), and exited the program in 2006. Some of the demographic characteristics of population with HIV/AIDS by the time they entered the program appeared to be similar to those of past studies in the field including age, gender, race, and education. The majority of this study's participants (approximately 81% of 2,271 participants) ranged in age from 30's to 40's with mean age of 41. Of the 21 studies reviewed for this research, mean age of participants in two studies was 41 (Kielhofner et al., 2004; Van Grop et al., 1999) and ranged from 36.7 to 40 in 11 studies (Blalock et al.,

2002; Martin et al., 2006; Massagli et al., 1994; Rabkin et al., 2004). Thus, participants' mean age in other studies was not higher than 44.8 (Twamley et al., 2006).

Like most other studies reviewed, this study's participants were predominantly male. (74.9 %, n = 1,700), with females less than 25% (n = 549) of the participants. As described previously, of the 21 reviewed studies, four studies included only male participants (Darko et al., 1992; Heaton et al., 1994; Rabkin et al., 2004; Van Gorp et al., 1999), and five studies included females, which accounted for 10% or less than 10% of participants in the study (Burns et al., 2006; Leigh et al., 1995; Martin et al., 2006; Massagli et al., 1994; Yelin, et al., 1991). In other studies, female did not account more than 31% of participants, except for in Conover et al. (2006) and Jefferson (2007) that included more females than males (58% and 54% of participants, respectively).

The findings from this study showed very small percentages of participants from race/ethnic groups other than White and African American, which together accounted for approximately 87% of the total participants (N = 2,271). Non-White and Non-American American participants all together accounted for approximately 2%, except for Latino individuals (n = 210, 9.2% of the total populations). Of the 21 reviewed studies, some studies included non-White, non-African American, or non-Latino individuals as participants, although the percent was less than 10% (Henninger, 2006; Massagli et al., 1994; Rabkin et al., 2004; Razzano & Hamilton, 2005, 2006; Van Grop et al., 1999, 2007; Yelin et al., 1991) or slightly higher than 10% (Martin et al., 2004, 2006).

Regarding education at application, 37.4% (n = 849) of participants had a high school education and 23% (n = 522) had some post-secondary education (23%, n = 522).

The majority of participants in this study were unemployed when they applied to the VR program (90.5% of 2,271). Similarly, of the reviewed studies, 15 studies included a higher numbers of unemployed participants than employed participants, and 2 studies included only unemployed participants (Kielhofner et al., 2004; Van Grop et al., 2004). Participants' primary source of support were public benefits (64%, n = 1,460) or family and friends (18.6%, n = 422). The major public support participants received were SSI or SSDI. Likewise, most participants had insurance coverage from public sources and only approximately 2.4% of the participants (n = 54) had private insurance from their own employment. Although over 80% of the participants indicated that they had private residence, data did not specify whether it was independent residence or family-dependent residence, as well as whether it was temporary or permanent.

Some brief information on participants' health was available in the RSA-911 data including primary disability, secondary disability and its cause, and significant disability. Findings showed that primary disability that significantly hindered more than 92% of the participants with HIV/AIDS in entering the workforce was either general physical debilitation such as fatigue, weakness, and pain, or other physical impairments. Approximately 60% of these participants also had a secondary impairment other than HIV/AIDS including depressive and other mood disorders (16.8%, n = 382). In addition, disability of more than 80% of participants seriously limited one or more functional capacities in relation to employment outcomes (e.g., mobility, communication, and employment skills).

One third of participants in this study were self-referred to the VR program to receive VR services, whereas other participants were referred by other resources such as a community rehabilitation program and educational or medical institution. Regarding VR services, the five most commonly provided services were assessment (61.4%, n = 1,395), vocational rehabilitation counseling and guidance (57.2%, n = 1,298), transportation (35.3%, n = 801), diagnosis and treatment of impairments (29.6%, n = 673), and job placement assistance (20.6%, n = 467). As the small number of participants who received VR services reflected to some degree, approximately 50% of the participants were closed before receiving services, but the other half exited the program either with an employment outcome (28%, n = 562) or without employment after receiving services (28.3%, n = 642). The two major reasons for case close other than an achieved employment outcome were because (a) VR agencies were unable to locate or contact participants who provided no forwarding address when they moved or those who left the State and demonstrated their unwilling to continue to participate in the program (25%, n = 567) or (b) participants repeatedly failed to keep appointments for assessment, counseling, or other services (18.8%, n = 426).

Research Question Two

Chi-square analyses and independent t-tests were conducted to investigate whether type of closure (exited the program with employment or without an employment outcome after receiving services) was different based on socio-demographic characteristics, health variables, and service-related variables. The findings indicated significant differences in employment outcomes in relation to employment status at

application, weekly working hours and earnings at application, primary source of support at application and closure, public benefits and insurance coverage both at application and closure, education at closure, cause of secondary impairments, source of referral, eight services (VR counseling and guidance, job readiness training, job search assistance, job placement assistance, on the job support, transportation services, maintenance, and information and referral services), and cost of purchased services.

However, no differences were found in employment outcomes in relation to age both at application and closure, gender, race, education at application, living arrangement at application, primary impairments, secondary impairment (whether or not participants have), four services (assessment, diagnosis and treatment of impairments, college training, and occupational/vocational training), and length of participation.

Findings indicated that participants who worked without supports in an integrated setting at application were more likely to be employed at closure. Thus, those who exited the program with employment worked more hours and had higher amounts of weekly earnings at application. In relation to employment status, Martin et al. (2004, 2006) reported contrasting findings in that employment status and hours worked before study participation were not different between individuals not seeking employment and those seeking employment, who were more likely to obtain employment while in the study.

Findings in this study also demonstrated that participants who were employed at closure were less likely to have public support but more likely to have personal income as their primary source of support. The higher likelihood of employment at closure among those whose primary source of support at application was personal income may overlap

the finding of higher likelihood of employment at closure among those who worked without supports in an integrated setting at application because approximately 71% (n = 63) of participants who worked without supports in an integrated setting at application (n = 89) demonstrated personal income as their primary income; thus, of 103 participants whose primary source of support at application was personal income, 61.2% (n = 62) worked without support in integrated setting at application. However, the finding in this study of significant group differences between employed and unemployed participants at closure on SSI contrasts those of Van Gorp et al.'s (2007) study, which found no significant differences between employed and unemployed individuals on SSI.

Likewise, participants in this study who were employed at closure were less likely to have Medicaid and Medicare both at application and closure. These findings are consistent with those of Bernell and Shinogle (2005), which reported significantly higher percentages of individuals on Medicaid and Medicare among unemployed individuals compared to employed individuals. The finding on Medicaid was also consistent in Razzano and Hamilton (2005) and Razzano et al. (2006). However, unlike in the current study, Medicare was not found to be significantly different between the two groups in Razzano and Hamilton's (2005) study.

Regarding education at closure, findings indicated that participants in this study who exited the VR program with employment were more likely to have a degree of post-secondary education including an associate degree, voc/tech certification, or a bachelor's degree or higher degree. This finding is similar with that of studies that also found employed individuals were more likely to have a higher level of education than

unemployed individuals (Bernell & Shinogle, 2005; Massagli et al., 1994;). However, many studies have reported no significant differences on education levels between employed and unemployed individuals (Burns et al., 2006, 2007; Razzano & Hamilton, 2005; Razzano et al., 2006; Twamley et al., 2006; Van Gorp et al., 1999, Van Gorp et al., 2007).

The finding in this study that employed participants were less likely to have drug abuse or dependence other than alcohol was similar with findings of previous studies that employed individuals were less likely to have substance abuse or dependence (Bernell & Shinogle, 2005; Massagli et al., 1994). However, other previous studies reported no significant differences between employed and unemployed individuals in relation to substance abuse or dependence (Blalock et al., 2002; Martin et al., 2004; Van Gorp et al., 2007; Yelin et al., 1991).

Unlike drug abuse or dependence (other than alcohol), depressive and other mood disorders were more prevalent among employed participants in this study. This finding is similar to the finding in Kielhofner et al.'s (2004) study that history of mental illness was significantly related to an increased likelihood of successful employment; however, it contrasts with findings of other studies that reported no significant differences in prevalence of depression, mental health, or psychiatric disorders between employed individuals and unemployed individuals (Blalock et al., 2002; Martin et al., 2006; Van Gorp et al., 2007). A possible explanation for higher prevalence of depressive and mood disorders among employed individuals may be found in examining differences in levels of education at closure between participants with depressive and mood disorders and

those without those disabilities. When frequencies of education at closure were compared between participants with and without depressive and other mood disorders using chi-square analysis, those with depressive and other mood disorders were more likely to have a bachelor's degree or a higher degree, but less likely to have a high school or less than high school education.

Regarding service-related variables, significant group differences were found in eight services including VR counseling and guidance, job readiness training, job search assistance, job placement assistance, on the job support, transportation services, maintenance, and information & referral services. Of the eight services, two services including VR counseling and guidance and transportation services were less likely to be provided to participants with an employment outcome at closure than expected; however, these participants were more likely to receive the other six services. Average cost of purchased services was also found to be significantly higher among employed participants than those without employment at closure. Although these findings may have also been reported in other studies involving individuals with other types of disabilities such as traumatic brain injury (Catalano, Pereira, Wu, Ho, & Chan, 2006), no previous studies on VR services and employment outcomes for individuals living with HIV/AIDS examined this variable.

Research Question Three

Findings of the binary logistic regression analyses conducted to identify significant predictors of group membership (employed vs. unemployed) using 28 variables showed eight service-related variables that were statistically significant in both

Group One and Group Two. This finding may suggest the contribution of the provision of services that practically and directly assist in searching for and obtaining a job, rather than individual characteristics that individuals bring to the rehabilitation process, to a successful employment outcome.

In the current study, only variables that were statistically significant for both Group One and Group Two will be discussed (Cohen, Cohen, West, & Aiken, 2003). First, three service variables of job search assistance, job placement assistance, and on the job supports were related to higher probability of employment at closure. Of the three service variables, job placement service was one that participants were more likely to receive, whereas on the job support was provided to the least number of participants in both Group One and Group Two. Specifically, of 558 participants in Group One, 210 (37.6%), 190 (34.1%), and 69 (12.4%) participants received job placement service, job search assistance, and on the job support, respectively. Similarly, of 564 participants in Group Two, 217 (38.5%), 190 (33.7%), and 58 (10.3%) participants received job placement service, job search assistance, and on the job support, respectively. Apparently, on the job support was relatively less likely to be provided to participants for some reason, which may not be fully explained in this study.

In the RSA manual (2006), job search assistance refers to assistance in conducting a job search including preparing a resume, finding job opportunities, developing interview skills, and communicating with employers. Job placement assistance is a referral to a certain job for a job interview, whether or not the individual obtained the job. Findings on these two services suggest that enhancing job seeking skills

and assisting in obtaining opportunities for interviews may improve the probability of gaining employment (McReynolds & Garske, 2001). These findings may extend the knowledge that job search and job placement play a critical role in the VR process in assisting obtaining employment for people with disabilities including orthopedic disabilities (Bolton, Bellini, & Brookings, 2000; Chan et al., 2006), psychiatric (Bolton et al., 2000; Rosenthal, Dalton, & Gervery, 2007), chronic medical, mental retardation, and learning disabilities (Bolton et al., 2000), and attention-deficit hyperactivity disorder (Schaller, Yang, & Trainor, 2006)

The relationship between receiving job search and job placement assistance and a higher probability of being employed may also reflect the needs of unemployed individuals living with HIV/AIDS contemplating a return to work for assistance in finding employment. In several studies on concerns and barriers to employment among unemployed individuals with HIV/AIDS, participants acknowledged their needs for vocational rehabilitation services to find employment, including job seeking skills (Timmons and Fesko, 2004), access to job resources and interviewing skills (Brooks & Klosinski, 1999; Hergenrather et al., 2005, 2006), job referrals, (Brooks & Klosinski, 1999), resume writing, completing applications, following-up, and making disclosure decisions (Hergenrather et al., 2005, 2006). In addition, in a study in which the theory of planned behavior was applied to explore beliefs and behaviors in relation to seeking employment, of 324 participants with HIV/AIDS who completed the Employment Interest Survey, more than half or 51.9% (n = 168) reported a lack of job-seeking skills as a barrier to employment (Hergenrather, Clark, & Rhodes, 2004).

On the job support denotes services provided to an employed individual for the purpose of job stability and job retention, including job coaching, follow-up services, and job retention services. On the job support may be essential in assisting individuals with HIV/AIDS, especially for those who have been unemployed for a long period, to successfully adjust to their work environment. Individuals living with HIV/AIDS may face various issues at work in relation to updating their job skills, making decisions on disclosure or non-disclosure of their HIV/AIDS status, maintaining their health while performing their job responsibilities, requesting accommodations, and dealing with discrimination at work. Although the need for on the job support to address these issues may not be particular to only individuals with HIV/AIDS, studies have addressed concerns or needs of individuals with HIV/AIDS in relation to the nature of HIV/AIDS to be able to work and retain their employment. For instance, complying with medical treatment is critical for individuals living with HIV/AIDS in maintaining their health. In order for them to retain their employment, therefore, securing job accommodations may be essential including flexible work schedules that enable them to maintain frequent medical appointments (Brooks & Klosinski, 1999; Campbell, 1998; Conyers, 2004b; Fesko, 2001; Glenn et al., 2003; Hergenrather et al., 2006; Hunt, et al., 2003), shifting job duties (Hunt, et al., 2003) taking medications at work (Hergenrather et al., 2006; Hunt et al., 2003), and taking rests as needed due to HIV-related symptoms (e.g., fatigue). The importance of flexibility at work was also reported in Yelin et al.'s (1991) study. In a Cox proportional hazard regression conducted to estimate the proportional hazard of employment loss in relation to demographic, medical, and work-related variables, having

more discretion over work (pace of work, work procedures, what is produced, break time, sick leave, arrival and departure time) lowered the probability of leaving one's job (Yelin et al., 1991). However, many people with HIV/AIDS may be concerned about requesting job accommodations or experience difficulties in obtaining accommodations due to various reasons including concerns about disclosure of HIV/AIDS and potential discrimination.

In the Kirk Employment Empowerment Project (KEEP) designed to develop employment service approaches for individuals with HIV/AIDS, Escovitz & Donegan (2005) identified the effectiveness and significance of on the job support in helping individuals with HIV/AIDS maintain their employment once they obtain employment. In the KEEP project, participants, once they began to work, applied management strategies that they developed with their counselor (e.g., managing health, functional limitations at work, and job duties). Participants also received assistance in developing skills needed in handling various issues they faced at work such as difficulties of relationships with co-workers and acquiring accommodations, as well as prompt supports when requested. These services provided on the job were reported as effectively increasing job retention for individuals living with HIV/AIDS once they obtained employment.

Regarding length of participation in the program, participants in this study were less likely to obtain employment when they stayed in the program longer. The lowest probability of employment was shown among those who stayed in the program for three years or longer compared to those who stayed less than a year. This finding is consistent with that of a study on employment outcomes of individuals with mental retardation

(Bolton et al., 2000). In Bolton et al.'s study, regression coefficients showed length of participation in the program was negatively related to prediction of competitive employment for individuals with mental retardation.

Unlike length of participation in the program, for participants in this study, the higher participants' costs of purchased services were, the greater the likelihood of employment. This finding was consistent with findings of studies that identified the positive impact of total cost on employment outcomes for individuals with other disabilities such as orthopedic, psychiatric, and mental retardation (Bolton et al., 2000; Fish, Lesh, Evenson, & Leung, 1982). For example, in a multiple regression (Bolton et al., 2000), total costs of purchased services were found to be significantly related to a higher likelihood of obtaining competitive employment for participants with orthopedic, psychiatric, and mental retardation, but not for those with chronic medical problems and learning disability.

In the current study, the largest difference in the probability of employment after receiving services was shown between participants whose cost of purchased services was equal to or higher than \$5,000.00 and those whose cost of purchased services was less than \$500.00. However, there was no significant difference in the probability of employment between those with less than \$500.00 of cost of purchased services and those with cost of purchased services, equal to or higher than \$500.00, but less than \$2,000.00. As the variable cost of purchased services includes only the total amount of money spent by the State VR agency to purchase services, and there may be services

participants received through non-VR sources or a combination of VR and other resources, this finding may not answer what costs are for individual services.

Research Question Four

Research question four consisted of three questions. Question four (a) provided the descriptive information on employment outcomes for 549 employed participants by the time they exited the state VR program. The results indicated 54.3% (n = 298) of 549 participants worked less than 40 hours per week, whereas 44.1% (n = 242) worked 40 hours in a week and 1.7% (n = 9) worked more than 40 hours in a week. Regarding participants who worked less than 40 hours, only 11.8% of a total participants worked less than 20 hours and the majority worked at least 20 hours per week including those working 20 hours (14%, n = 77) and those working 30 hours (10.9%, n = 60).

Average weekly earnings for the 549 employed participants at closure were \$385.88 with mean hourly wage of \$12.50. (range \$5.15. to \$200.00, SD = \$10.87; nine participants with zero working hours were excluded from the calculation). Mean hourly wage and hours worked in a week were different across four groups divided based on weekly earnings. Specifically, mean hourly wage and hours worked in a week for participants with less than \$200.00 of weekly earnings were \$8.01 and 17.89 hours, followed by \$8.63 and 30.32 hours ($\geq \200.00 - $< \$300.00$ of weekly earnings), \$11.47 and 35.80 hours ($\geq \300.00 - $< \$500.00$), and \$21.00 and 38.18 hours ($\geq \$500.00$). This finding showed participants with weekly earnings equal to or greater than \$200.00, but less than \$300.00 in comparison to those with less than \$200.00 of weekly earnings, the main difference was not in earnings per hour, but in hours per week. However, in

comparing participants with weekly earnings equal to or higher than \$500.00 with those having weekly earnings equal to or higher than \$300.00, but less than \$500.00; the great difference was not in working hours, but in earnings per hours.

For the 242 participants working 40 hours a week (44.1% of a total of participants), mean and median weekly earnings were \$536.54 and \$480.00, respectively, which was lower than the \$719.00 median weekly earnings of the nation's 106.5 million full-time wage and salary workers as reported by the Bureau of Labor Statistics of the U.S. Department of Labor in the first quarter of 2008 (U.S. Department of Labor, 2008).

The majority of participants in this study (79.2% of 548 participants) had an occupation in one of three fields including professional, technical, or managerial occupations (n = 196, 35.8%); clerical or sales occupations (n = 127, 23.25%); and service occupations (n = 111, 20.3%). Very few of the participants had an occupation involving higher physical demands such as structural work occupations. This finding may suggest a preference for a job requiring less physical demands such as computer-related jobs among individuals living with HIV/AIDS due to concerns about maintaining their health while working (Brooks & Klosinski, 1999).

Of the three major types of occupations, service occupations were more prevalent among female participants (35.8% of 123 females vs. 15.8% of 425 males), African American participants (27.0% of n = 256 African Americans vs. 13.3% of 233 Whites), and those with less than high school education (40.3% of 67 vs. 3.9% of 103 participants with at least a four-year degree). Likewise, professional, technical, or managerial occupations were less likely among females (26.6% of n = 123), African American

participants (24.2% of n = 256), and those with a high school or less than high school education, but were more likely among Whites (46.4% of n = 233) and those with a bachelor's degree or higher (72.8% of n = 103).

Whether length of participation and cost of purchased services varied with the number of services received was explored in research question four (b). Note that none of the 21 studies reviewed in this study included service-related variables in their analyses. For participants in this study, the greater the number of services received, the higher the costs of purchased services were. Differences were most evident between participants for whom less than \$500.00 was spent to purchase services and those whose cost of purchased services was \$5,000.00 or higher. Participants with less than \$500.00 of cost of purchased services were more likely to receive less than four services, and participants whose cost of purchased services was \$5,000.00 or higher were more likely to receive eight or more services. Note that cost of purchased services only included the amount of money spent by a VR agency, and therefore, there may be services that were counted when they were provided through non-VR funding sources.

Regarding the length of participation in relation to the number of services, although the chi-square analysis was overall significant, the only cell with a significant difference was participants who stayed in the program for less than a year. Participants who stayed in the program for equal to or more than three years were more likely to receive less than four services, whereas participants who stayed in the program equal to or longer than three years were less likely to receive less than four services.

Research question four (c) examined differences in weekly earnings based on length of participation, cost of purchased services, number of services received, types of services, and socio-demographic characteristics. The results found significant differences in weekly earnings based on number of services received, seven service variables (assessment, VR counseling and guidance, college or university training, job search assistance, transportation, maintenance and information, and referral services), and seven socio-demographic characteristics (race, education, occupation, SSI, SSDI, Medicaid, and Medicare).

Differences in weekly earnings based on the number of services received were evident, particularly between those with weekly earnings less than \$200.00 and those with weekly earnings equal to or more than \$500.00. Participants whose weekly earning was less than \$200.00 were more likely to receive fewer than four services than participants whose weekly earning was equal to or more than \$500.00. However, participants whose weekly earning was equal to or more than \$500.00 were more likely to receive more than eight services than those whose weekly earning was less than \$200.00.

However, weekly earnings were not different based on the amount of money spent to purchase services and length of program participation. This finding might suggest that cost of purchased services and length of participation are not related to earnings, but may be related to employment status (employed vs. unemployed). To the author's current knowledge, no study has explored these relationships.

Regarding services, the results indicated that participants with weekly earnings equal to or higher than \$500.00 were more likely to receive assessment, vocational

counseling and guidance, job search assistance, information and referral services, college training, job search assistance, and information and referral services, whereas participants with less than \$200.00 of weekly earnings were less likely to receive those services.

The higher weekly earnings among Whites and participants with a higher level of education, particularly those with at least four-year-college education, were consistent with findings of Conover et al. (2006). In that study, income was significantly higher among males, Whites in comparison to African Americans and Latinos, and those with a four-year degree or higher degree.

Regarding occupations, weekly earnings were found to be higher among participants with professional, technical, and managerial occupations and lower among those with service occupations or clerical and sales occupations. As mentioned previously, participants with professional, technical, and managerial occupations were more likely to have a four-year degree or higher level of education. In addition, these participants were more likely to work full-time or more hours than those with service occupations or clerical and sales occupations.

Participants who were receiving public benefits were more likely to earn less than \$200.00. On the other hand, participants whose weekly earning was equal to or higher than \$500.00 were less likely to receive public benefits including Medicaid, Medicare, SSI, and SSDI. In Conover et al.'s (2006) study, public income was found to be higher among females, Latinos, and those with a lower level of education than a four-year college degree. Similarly, La Forge and Harrison (1987) found lower wages among

individuals with chronic low back pain receiving public benefits of worker's compensation.

Individuals with HIV/AIDS Seeking VR Services

The total number of individuals utilizing VR services and living with HIV/AIDS, who exited the program in 2006, was 2,271. This number of VR recipients constitutes approximately 0.47% of the 485,020 adults or adolescents living with HIV/AIDS in the 33 states with confidential name-based HIV infection reporting (353,825 males and 131,195 females) at the end of 2006 (CDC, 2006). Regarding the proportion of participants by race/ethnicity, this study demonstrated similar proportion with the overall proportions for race/ethnicity in the general population living with HIV/AIDS. Of the 485,020 adults or adolescents living with HIV/AIDS, the overall proportion of African Americans, Whites, and Latinos was 227,608 (46.93%), 165,044 (34.03%), and 83,431 (17.2%), respectively. In this study, African Americans, Whites, and Latinos accounted for 51.7% (n = 1,174), 35.4% (n = 803), and 9.2% (n = 210), respectively.

These proportions demonstrate a marked change by race/ethnicity among people with HIV/AIDS since 1981 when Whites accounted for more than 60% and African Americans accounted for less than 25% of individuals with HIV/AIDS. Although further investigation may be needed using additional years of RSA data to determine if changes are occurring in the number of individuals with HIV/AIDS who enter and exit the state/federal VR program by year, it has been reported that not many individuals with HIV/AIDS have received VR services. Thus, it is worth noting that African American participants with HIV/AIDS accounted for more than 50% of the participants with

HIV/AIDS in this study, whereas overall rates of African Americans with disabilities represented approximately 22% of the national population of VR customers.

Dropping Out from Services

The overall drop-out rates among participants with HIV/AIDS may need additional research as approximately half of the 2,271 participants who exited the program were closed without completing the program. The major reasons were: (a) moved without a forwarding address or were unavailable; (b) failed to cooperate; or (c) chose not to participate or continue in the VR program at this time. Thus, of the three race/ethnicity groups, African American participants were more likely to be closed as unsuccessful than Whites and Latinos. Specifically, the number of African American participants at application (n = 1,174), dropped to only 579 (49.3%) participants who received services and exited the program in 2006. Compared to African American participants, White (58.65%, n = 471) and Latino participants (60.95%, n = 128) were more likely to stay in the program and receive VR services.

Although findings of this study are not conclusive as to what would explain the higher rates of dropping-out before completing the program among participants with HIV/AIDS, some speculation about this finding is provided. First, instability of participants' residence may be a factor. Although more than 80% of the participants indicated having a private residence, it was unknown where they stayed, with whom they stayed, and whether it was permanent or temporary. As the most frequent reason for closure was due to loss of contact with the participant, it may be possible that participants' dropping-out may be related to instability of their residence.

Second, further discussion may be needed on the issue of failure to cooperate. According to the RSA data file manual, failure to cooperate was listed when “an individual’s action (or non-action) makes it impossible to begin or continue a VR program” and included “repeated failures to keep appointments for assessment, counseling, or other services” (RSA, 2006, p. 40). To more adequately explain the higher rates of failure to cooperate among participants may require more specific definitions of failure to cooperate in the RSA data file. For example, it is not clear how action or non-action of an individual is defined and whether it includes only repeated failures to keep appointments or simply impossible to begin or continue VR services. It is possible that the determination of action or non-action of an individual may involve service providers’ own perceptions and judgment.

It is also worth noting the disproportionate rates of failure to cooperate among African American participants (25.4% of 1,171 African Americans vs. 11.8% of 803 Whites and 10.5% of 210 Latinos). Although no definitive answer can be drawn from the findings of this study, it may be possible that participant failure to cooperate could be produced from issues existing between rehabilitation counselors and participants including different perspectives, expectations, and levels of understanding, rather than the participant’s unwillingness to participate in the program.

For example, participants may feel they are not given sufficient time to express and address their concerns and worries, and to be listened to by their counselor. This can be due to limited opportunities to meet their counselor, or because their needs or concerns were not addressed due to a rehabilitation counselors’ lack of understanding, knowledge,

and competence in working with individuals with HIV/AIDS. As a result, a participant may not be confident about the advantages and disadvantages of returning to work and the reasons for returning to work, as well as benefits of participating in the VR program. Building a rapport with a client may take time, and may be essential in developing a good working relationship and obtaining a successful outcome from counseling (Escovitz & Donegan, 2005).

When individuals with HIV/AIDS are referred to a VR agency, they may have expectations about services and outcomes including how they might be treated, encouraged, and/or motivated by their VR counselors, services they would receive, and outcomes of those services (e.g., employment, type of jobs, and earnings). Thus, they may have expectations and concerns regarding returning to work that would be addressed by rehabilitation counselors. If consumers do not feel that their concerns and expectations are being addressed adequately they may simply stop complying with the VR process.

As VR customers have expectations, rehabilitation professionals may also have expectations that may or may not be communicated with their clients. Thus, their expectations could be based on their own perceptions about particular disabilities as well as individual characteristics (e.g., race and education). For instance, rehabilitation counselors who have little experience working with individuals with HIV/AIDS, may not prefer to work with individuals with HIV/AIDS due to issues such as societal stigma.

Service Variables

Of the individual demographic and service variables entered into the binary logistic regression, only service variables were found to significantly predict employment

or unemployment of participants with HIV/AIDS in the 2006 data file. This finding may suggest that receiving VR services may increase the likelihood of obtaining employment among individuals with HIV/AIDS. However, this finding may need to be interpreted with caution due to the following reasons. First, in this study, the number of participants who received three VR services that were found to be significantly predictive of employment (job search assistance, job placement assistance, and on the job supports) was small. For example, the proportion of participants who received job search assistance was only 34.3% (n = 404) of 1,178 participants who exited the program with or without employment after receiving services. Of the 1,178 participants, job placement assistance and on the job supports were also provided only to 38.5% (n = 453) and 11.5% (n = 136), respectively. Furthermore, the overall rates of provision of other services were not so different from these three services except for assessment and vocational rehabilitation counseling, which was provided to more than 50% of the total number of participants. These findings may not be limited to only those individuals with HIV/AIDS, but other disabilities (e.g., Schaller et al., 2006). Therefore, questions about the rehab process and work done by rehabilitation counselors in considering, determining, and providing services with their customers may be necessary. Especially, as rehabilitation services are provided based on an individualized plan for employment for each customer, there could be more subjective judgment of rehabilitation counselors involved.

Secondly, findings may not explain the effects of a combination of services provided. For example, although on the job support was found to be significantly related to employment, but not transportation. The successful employment outcome could be

obtained because an individual received transportation service in addition to on the job support. Therefore, making conclusions as to those three services without considering what other services the individual received may be difficult

Thirdly, the length of program participation had a negative impact on employment outcome, whereas other service variables including cost of purchased services were found to increase the likelihood of employment. A general assumption or explanation for this finding might be that individuals with more health issues might stay in the program longer receiving health-related services, and might be less likely to be employed due to their health. In order to explore this assumption, additional chi-square analyses were conducted using variables that may demonstrate health status of participation in the RSA data file (cause of secondary impairments and receipt of a service of diagnosis and treatment). However, neither of the two variables was found to be significantly related to length of services. Although this study does not provide findings that support the general assumption, it may not be appropriate to conclude that length of participation is not related to individual health variables because information provided in the RSA data is very limited and it may be more related to specific health status or functioning. In addition, as differences were shown between participants who stayed in the program less than a year and those stayed in the program three years or longer, further exploration of differences between the two groups may be needed to investigate what combination of circumstances lead to participants who stayed longer, but did not obtain successful employment.

Lastly, the issues as to whether the likelihood of obtaining employment, as well as receiving higher earnings, may increase as more money is invested on purchased services may need additional research. Although an answer may not be found from this discussion, consideration of overall findings on costs of purchased services may raise new questions for further exploration. One of the points may be that no significant difference was found in the likelihood of being employed at closure between participants in the reference group (less than \$500.00 of costs of purchased services) and participants with equal to or higher than \$500.00, but less than \$2,000.00 of costs of purchased services. On the other hand, the most significant difference was shown between participants with less than \$500.00 cost of purchased services and those with equal to or higher than \$5,000.00 cost of purchased services. Interestingly, this difference based on costs of purchased services was also shown in relation to number of services and length of program participation. Participants with less than \$500.00 cost of purchased services were significantly more likely to receive less than four services, to participate in the program less than a year, and to receive lower amounts of earnings at closure. In contrast, participants with equal to or higher than \$5,000.00 cost of purchased services were more likely to receive equal to or more than eight services, to participate in the program more than 3 years, and to receive higher amounts of earnings at closure. According to these findings, it might be that receiving more services and spending more money while in the program are positively related to obtaining employment. However, it is worth noting that participants who received more services and spent more money to receive services were significantly more likely to stay in the program longer than or equal to 3 years or longer, which is a

significant predictor of employment in this study. This finding suggests that all these issues might be related to a certain type of service provided to participants that may or may not require more time in the program and money to purchase. It is also possible that the major impact of cost of purchased services on employment outcome might occur only when there is a certain amount of difference (e.g., \$500.00 vs. \$5,000.00).

Individual Demographics and Employment Outcomes

The finding that none of the individual demographic variables entered into the logistic regression was significantly predictive of employment and that some demographic variables were not consistent in relation to employment outcomes (employment status at closure vs. earnings at closure) may need to be further examined as to whether demographic characteristics are not related to employment outcomes at all. Although multivariate analysis may need to be conducted to provide a more concrete answer, current findings on demographic variables might suggest that those individual demographics, particularly race/ethnicity and level of education, might be more likely to be related to participants' earnings rather than employment status. A possible explanation for this assumption is that job search activities may be performed that target certain occupations based upon an individual's education.

In other words, whether participants hold a higher degree or less education, they might find some types of jobs, although earnings may be at different levels based on types of occupations (e.g., service occupations vs. professional and managerial). In addition, it is worth noting that White participants were shown to receive significantly higher amounts of earnings than African American participants at closure, whereas

employment status for both at application and at closure was similar across the different race/ethnicity groups. Thus, White participants were not only significantly more likely to enter into the program with higher levels of education (from college or higher levels of education), but also more likely to receive college training compared to African American or Latino participants. Although the reason for this is not known, possible assumptions might include rehabilitation counselors' higher expectations toward them as well as encouragement (or recommendation) to continue to study and finish a degree provided to White participants, participants with a relatively higher education, and/or Whites with a higher level of education. Further exploration may be needed on race/ethnicity in relation to employment status and earnings, knowing that (a) participants with a higher level of education (at least post-secondary education) are more likely to obtain professional and managerial occupations, (b) participants with these occupations were significantly more likely to receive higher amounts of earnings, and (c) White participants were significantly more likely to have higher levels of education, professional and managerial occupations, and higher earnings than African American and Latino participants.

In fact, it is also worth noting that employment status was not different based on race/ethnicity not only in the current study, but also in most of the reviewed studies that included race in their chi-square analysis. Thus, none of the studies except for one study did not include race in their multivariate analyses.

Implications for Practice

The major findings of this study may have implications for practice. The finding of this study indicates that VR services including job search assistance, job placement services, and on the job support significantly benefit individuals with HIV/AIDS in obtaining employment. This finding supports the findings of studies that have identified concerns and needs for VR assistance in obtaining and maintaining employment among individuals living with HIV/AIDS who are contemplating returning to work. The quality of these services may be closely related to rehabilitation counselors' competence such as their knowledge about current job market, key strategies or considerations in seeking for a particular job, an approach to different kinds of markets, and medical and psychosocial aspects of HIV/AIDS, as well as their understanding of their consumers' individual differences and needs (Goldblum & Kohlenberg, 2005). In addition, providing these services may require rehabilitation counselors to provide assistance in increasing self-initiation and self-determination based on careful evaluation of their situations and options (Paul-Ward, Braveman, Kielhofner, & Levin, 2005).

Individuals living with HIV/AIDS often are found to have been unemployed for a long period since they left their job after an HIV/AIDS diagnosis, and therefore they often need assistance in conducting a job search (McReynolds & Garske, 2001). Thus, they might not be sure of their readiness for a job, as well as what they want to do, what types of jobs are matched with their skills and preferences, and how to find job information. Therefore, in the process of providing job search assistance, rehabilitation counselors need to provide assistance based on an individual's needs, concerns,

limitations, and goals (Berry & Hunt, 2005; Groomes, 1998; McReynolds & Garske, 2001).

Regarding on the job supports, as previously mentioned, many studies identified perceived or experienced barriers and difficulties that prevented individuals with HIV/AIDS from maintaining employment and assistance in dealing with issues at work such as obtaining job accommodations and responding to discriminatory treatment (Braveman, Helfrich, & Albrecht, 2003; Conyers, 2004a; Fesko, 2001a, 2001b; Hergenrather et al., 2005; Hunt et al., 2003). Therefore, rehabilitation counselors need to have a comprehensive understanding of issues faced by individuals with HIV/AIDS at work. Thus, to effectively assist individuals with HIV/AIDS who face various issues at work that may be related to their HIV/AIDS diagnosis, rehabilitation counselors need to understand societal beliefs about the cause of disability (e.g., HIV/AIDS in connection to homosexuality and IV drug use) and bias or stigma attached to HIV/AIDS (Schaller, Parker, & Garcia, 1998). In addition to providing assistance for individuals to be better prepared for employment, it would be beneficial to provide continuous assistance to individuals with adjusting to the working environment to help them maintain employment. Moreover, having staff readily available and promptly responding to individuals who need to discuss issues at work would help them make more informed and careful decisions and avoid leaving their job without a discussion (Escovitz & Donegan, 2005).

Also, rehabilitation counselors need to assist with different levels of difficulty and need in adjusting to a work environment and obtaining job accommodations due to individual differences. For example, individuals with a full-time job and those with a

part-time job may have different levels of health functioning and therefore different needs for job accommodations (Conyers & Boomer, 2005). Thus, as shown in the current study, they might have different types of jobs and/or earnings based on gender, race/ethnicity, and level of education. To be able to address the unique needs of each individual with HIV/AIDS, applying an individualized approach by considering his or her unique individuals characteristics, environments, strengths and weaknesses, and goals is required to rehabilitation counselor in delivering vocational rehabilitation services with the individual (McReynolds & Garske, 2001). Establishing effective and trusting relationships based on understanding of differences and willingness of providing services adapted to individual differences may also help with providing individual specific services (Schaller et al., 1998).

Relatively small numbers of participants from racial groups other than Whites and African Americans, including Latinos, American Indians or Alaska Natives, Asians, and Native Hawaiians or Other Pacific Islanders, who received VR services, may also suggest need for case-finding activities in the rehabilitation process. Rehabilitation counselors may need to conduct on-going case finding activities by expanding referral sources and coordinating and exchanging services with as many agencies as possible serving individuals with HIV/AIDS and other disabilities (Write & Martin, 1999).

Limitations and Recommendations for Future Research

This study had several limitations that should be noted. First, analysis in this study was limited to individual characteristics and VR services provided in relation to employment outcomes, although there may be other aspects that may also have an impact

on employment outcomes such as institutional aspects (e.g., rehabilitation policy, social values and response of society toward individuals with HIV/AIDS), rehabilitation professionals' competency, and quality of services.

Variables that have been found to be significantly related to employment outcomes in other studies, but not available in the RSA-911 data include physical and mental health and functioning, HIV/AIDS-related symptoms (e.g., fatigue), diagnosis of HIV or AIDS, length of unemployment prior to application, and change of employment status and earnings after 90 day's duration (Burn et al., 2007; Conover et al., 2006; Rabkin et al., 2004; Rosenthal et al., 2007; Van Gorp et al., 1999, 2007). Lack of information such as employment status and earnings after 90 day's duration may also limit longitudinal follow-up studies. The RSA-911 data file may also include incorrect information (e.g., a participant who had a service occupation working part-time and earning \$200.00 per hour) as counselors could make errors when entering data into the system in spite of crosschecks systems developed to reduce potential errors.

Construct validity is an issue because of (a) a poor match of some definitions of variables used in the RSA data file and in the literature and (b) vagueness of definition of some variables in the RSA data file. For example, the RSA-911 data file does not distinguish VR customers based upon severity of HIV-related symptoms such as asymptomatic HIV, HIV with symptoms, or AIDS, whereas most literature on this topic differentiated participants based on asymptomatic HIV, HIV with symptoms, or AIDS. Another example is earnings, which was measured based on different definitions (e.g., earnings a week prior to study participation or a typical week). In addition, the research

design does not allow determination of cause of effect between variables and employment outcomes.

This study did not include American Indians or Alaskan Natives, Asians, and Native Hawaiians or Pacific Islanders, due to the small number of individuals; therefore, the results of this study may not be generalized to these populations. In addition, there is a small number of females across racial groups ($n = 534$, 24.4%) to be representative. Another limitation is that this study may not fully identify complex relationships between employment outcomes and socio-demographic and service variables as this study utilized a database from one fiscal year rather than multiple years.

Future research may need to expand the use of the RSA-911 data by including data from multiple years so that it may better demonstrate changes and the consistency of information across data from different years. For example, changes in the number of VR consumers and rates of successful employment among those who participated in the VR program across years would be useful information in understanding the increasing needs for and desire to work among individuals living with HIV/AIDS. Thus, the low percentage of on the job support service provided to VR consumers with HIV/AIDS may need to be explored for further explanation. The negative impact of length of participation on the likelihood of employment also needs to be further investigated to explain whether it was due to their health status, a particular service that requires them to stay longer but does not help with obtaining employment, or any other possible reasons.

The results of this study found differences from chi-square analysis in socio-demographics and service-related variables in relation to employment status vs. weekly

earnings. For example, race differences were not found in employment status at closure, whereas White participants were significantly more likely to have higher weekly earnings. This finding may suggest that variables that have a significant impact on employment outcomes may not always impact on earnings. To further explain this, multivariate analysis using earnings as a criterion variable may need to be conducted to investigate socio-demographic information and service-related variables in relation to earnings of employed VR consumers with HIV/AIDS at closure.

Studies have also described that individuals with HIV/AIDS prefer a job requiring more mental effort (Brooks & Klosinski, 1999) and less physical demands, and that individuals with a job that allows more discretion at work may stay in a job longer (Massagli et al., 1994). These findings might imply that individuals who have professional, technical, and managerial occupations may stay longer at work. A longitudinal study may be necessary to examine factors that may be related to changes of employment status or maintenance of employment once obtaining employment after successful completion of VR programs.

One of the variables that were not addressed in the current study is the amount of public benefits in relation to employment status and earnings at closure, although this variable has been addressed in other studies (Conover et al., 2006, La Forge & Harrison, 1987) Further investigation may be needed to find whether the amount of public benefits are significantly related to less likelihood of employment, fewer working hours, and lower wages at closure. Follow-up studies on experiences among employed VR

consumers at closure and any changes to their employment status afterward due to any difficulties and lack of services may also be needed.

Appendix A: Demographic Characteristics of Participants

#	Study	N	Mean Age	Race ^a %	Gender%	Diagnosis ^b %	Education %	Employment ^c %
1	Yelin et al. (1991)	193	39	C 82 AA 9 L 6 Other 3	M 96 F 4	HIV 17 A 55 ARC 28	≥12 <16 31 ≥16 69	Employed 86 Unemployed 14
2	Darko et al. (1992)	108	37.3	-	M 100	HIV 41 A/ARC 13 N 46	-	Employed 47 Unemployed 28 Unknown 25 (of n with HIV/A)
3	Heaton et al. (1994)	378	33.3	C 80 Non-C 20	M 100	HIV 66 A 10 N 24	Mean: 14.6 years	Employed 84.1 Unemployed 15.9 (of n with HIV/A)
4	Massagli et al. (1994)	305	36.7	C 63.3 AA 22 L 10.8 Others 3.9	M 92.8 F 7.2	A 100	< 12 17.2 ≥ 12 <16 45.4 ≥ 16 28	-
5	Leigh et al. (1995)	1263	38.8	C 86.9 AA 3.2 L 6.3 Other 3.6	M 97.5 F 2.5	HIV 40.2 A 28.4 N 31.4	< 12 2.9 GED or 12 7.1 ≥ 13 89.9	Employed 75 Unemployed 25
6	Van Gorp, et al. (1999)	130	41	C 58 AA 16 L 20 Other 6	M 100	HIV 18 A 82	> 12 87	Employed 51 Unemployed 49

Appendix A: Demographic Characteristics of Participants (Continued)

#	Study	N	Mean age	Race ^a %		Gender%		Diagnosis ^b %		Education %		Employment ^c %	
7	Blalock et al. (2002)	200	40	C	23	M	75	A	100	< 12	13	Employed	40
				AA	70	F	25			GED or 12	39	Unemployed	60
				L	5					>12 < 16	34		
				Other	2					≤16	14		
8	Kielhofner et al. (2004)	129	41	C	39.5	M	82.2	A	100	< 12	14	Unemployed	100
				AA	44.2	F	16.3			GED or 12	20		
				L	10.8					> 12	66		
				Others	5.5								
9	Martin et al. (2004) ^d	235	39	C	43.8	M	87.6		-		-	Employed	20.4
				AA	27.7	F	1.1					Unemployed	79.6
				L	19.1	Other	1.3						
				Others	14.2								
10	Martin et al. (2006)	126	40	C	45.2	M	90.5	HIV	57.2	< 12 or GED	57.1	Employed	14.3
				AA	22.2	Other	9.4	A	42.1			Unemployed	85.7
				L	16.7								
				Others	11.9								
11	Rabkin et al. (2004)	141	40	C	58	M	100	HIV	18	≤13	88	-	
				AA	16			A	82				
				L	20								
				Others	6								
12	Bernell & Shinogle (2005)	2864	-	C	49	M	77	HIV	61	< 12	25	Employed	35
				Others	51	F	23	A	39	= 12	45	Unemployed	65
										>12 < 16	30		

Appendix A: Demographic Characteristics of Participants (Continued)

#	Study	N	Mean age	Race ^a		Gender		Diagnosis ^b		Education	Employment ^c		
				%		%		%		%		%	
13	Razzano & Hamilton (2005)	63	-	C	35	M	71	-	< 12	19	Employed	30	
				AA	49	F	25		GED or 12	32	Unemployed	70	
				L	8	Others	4		≥ 13	49			
				Others	8								
14	Razzano et al. (2006)	98	-	C	37	M	71	HIV	72	< 12	25	Employed	29
				AA	48	F	26	A	18	= 12	29	Unemployed	71
				L	7	Others	3		>12 < 16	30			
				Others	8			≥ 16	16				
15	Burns et al. (2006)	127	38	C	31	M	90	HIV	57.5	< 12	19.7	Employed	48
				AA	13	F	10	A	42.5	=12	22	Unemployed	52
				L	57				≥ 13 <16	44.9			
								≥16	13.4				
16	Conover et al. (2006)	1138	-	C	26	M	42	-		< 12	45	Employed	14
				AA	68	F	58			GED or 12	27	Unemployed	86
				L	7				≥ 13	28			
17	Henninger (2006)	111	42.6	C	53.2	M	83.9	HIV	71.2	Mean years: 13.8	Employed	34.2	
				AA	29.7	F	16.1	A	28.8		Unemployed	65.8	
				L	13.5								
				Others	3.6								
18	Twamley et al. (2006)	54	44.8	-		M	85	-		Mean years: 13.2	Employed	50	
						Others	15				Unemployed	50	

Appendix A: Demographic Characteristics of Participants (Continued)

#	Study	N	Mean age	Race ^a %	Gender %	Diagnosis ^b %	Education %	Employment ^c %
19	Burns et al. (2007)	72	37.5	L	100	M 93 F 7	HIV 40 A 60	< 12 24 Trade school/12 29 ≥ 13 47
20	Jefferson (2007) ^f	100	-	AA	100	M 46 F 54	HIV 100	< 12 11 =12 24 ≥ 13 <16 48 ≥16 17
21	Van Gorp, et al. (2007)	118	42	C 20 AA 56 L 21 Others 3	M 69 F 31	-	Mean years: 13.44	Unemployed 100

Note: ^a C: Caucasian, AA: African-American, L: Latino, Others: ethnicity other than C, AA, or L.

^b N: Negative HIV test,

^c 'Employed' includes both current part-time and full-time employment, but not volunteer work.

^d No comparison group was included in the total number of participants.

^e The proportion of individuals who were employed or unemployed was obtained from baseline interviews.

^f The total number includes only participants with HIV.

Appendix B: Significance of Group Differences based on Socio-Demographic Characteristics

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Age						+			-	-		-			-		-	+	+		+
Race/ethnicity						-	-		-	+		+	-	-	+			-			-
Gender				+			-		-	-			-	+	-				-		-
Education				+		-			-	-		+	-	-	-			-	-		-
Sexuality									+	+											-
Marital status									+	-					-				-		
SSDI									+												
SSI									-												-
Medicaid												+	+	+							
Medicare												+	-								
Past employment status									-												
Previous working hours									-												
Job types/nature of work				+					-												
Length of unemployment																		+			+
Income									-	±					-				-		
Mode of HIV infection													-	-							
Current living situation									-	-											
Incarceration history									-	-											
English as first language						-															-
Years in the U.S.																			-		
Acculturation																			-		

Note. 1. Yelin et al. (1991), 2. Darko et al. (1992), 3. Heaton et al. (1994), 4. Massagli et al. (1994), 5. Leigh et al. (1995), 6. Van Gorp et al. (1999), 7. Blalock et al. (2002), 8. Kielhofner et al. (2004), 9. Martin et al. (2004), 10. Martin et al. (2006), 11. Rabkin et al. (2004), 12. Bernell & Shinogle (2005), 13. Razzano & Hamilton (2005), 14. Razzano et al. (2006), 15. Burns et al. (2006), 16. Conover et al. (2006), 17. Henninger (2006), 18. Twamley et al. (2006), 19. Burns et al. (2007), 20. Jefferson (2007), 21. Van Gorp et al. (2007). + indicates significant differences; - indicates no difference; ± indicates both + and -.

Appendix C: Significance of Group Differences based on Health or Functioning

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
AIDS diagnosis		+								-		+	-	-	-				-		-
AIDS-related complex		+																			
HIV diagnosis		-																			
Days since HIV diagnosis										-											
Hospitalization				-			+														
CD4 cell count						+	+		+	+		+									±
Viral Load										-											-
Neurocognitive impairment			+																		
Neuropsychological impairment						+															
HIV-related symptoms									+				+								
Health function										+											
Fatigue		+				+			-												-
Physical limitations						+															-
Physical functioning																		+			+
Work-related ability																		+			

Note. 1. Yelin et al. (1991), 2. Darko et al. (1992), 3. Heaton et al. (1994), 4. Massagli et al. (1994), 5. Leigh et al. (1995), 6. Van Gorp et al. (1999), 7. Blalock et al. (2002), 8. Kielhofner et al. (2004), 9. Martin et al. (2004), 10. Martin et al. (2006), 11. Rabkin et al. (2004), 12. Bernell & Shinogle (2005), 13. Razzano & Hamilton(2005), 14. Razzano et al. (2006), 15. Burns et al. (2006), 16. Conover et al. (2006), 17. Henninger (2006), 18. Twamley et al. (2006), 19. Burns et al. (2007), 20. Jefferson (2007), 21. Van Gorp et al. (2007). + indicates significant differences; - indicates no difference; ± indicates both + & - findings

Appendix D: Significance of Group Differences based on Mental Health

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Substance use disorders (lifetime or current)				+			-		-			+									-
Alcohol abuse/ dependence									-												-
Mental health/functioning							-	+		-			-								
Perceived quality of life							+						-								-
Perceived health distress, energy/fatigue, pain, & cognitive & social functioning													-								
Perceived health, physical, & role functioning														+							
Prevalence of psychiatric disorders							-														
History of mental illness								+													
Depression			-										-								-
Level of depressive symptoms																					-
Level of hopelessness																					-
Perceived social support																					-
Perceived self-efficacy																					-

Note. 1. Yelin et al. (1991), 2. Darko et al. (1992), 3. Heaton et al. (1994), 4. Massagli et al. (1994), 5. Leigh et al. (1995), 6. Van Gorp et al. (1999), 7. Blalock et al. (2002), 8. Kielhofner et al. (2004), 9. Martin et al. (2004), 10. Martin et al. (2006), 11. Rabkin et al. (2004), 12. Bernell & Shinogle (2005), 13. Razzano & Hamilton(2005), 14. Razzano et al. (2006), 15. Burns et al. (2006), 16. Conover et al. (2006), 17. Henninger (2006), 18. Twamley et al. (2006), 19. Burns et al. (2007), 20. Jefferson (2007), 21. Van Gorp et al. (2007). + indicates significant differences; - indicates no difference; ± indicates both + & - findings

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