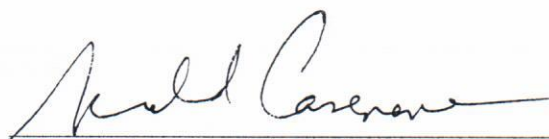
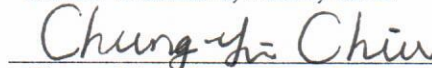


STATE VOCATIONAL REHABILITATION SERVICES AND EMPLOYMENT FOR
INDIVIDUALS WITH CARDIAC AND OTHER TYPES OF CIRCULATORY
SYSTEM CONDITIONS

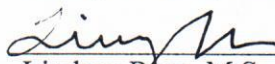
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DEDICATION

First, I would like to thank the members of my Graduate Committee: Dr. Chung-Yi Chiu, Dr. Gerald Casenave, and Ms. Lindsey Rose. I would also like to thank the newest member in my life, my beautiful daughter Liliana, for not getting too upset when I would make her go to bed early so that I can work in the evening. Thank you, Lili. Most importantly, though, I would like to thank my partner in life, my wonderfully intelligent wife, Vania, for her immeasurable support and understanding while I took on the additional stress of returning to school.

STATE VOCATIONAL REHABILITATION SERVICES AND EMPLOYMENT FOR
INDIVIDUALS WITH CARDIAC AND OTHER TYPES OF CIRCULATORY
SYSTEM CONDITIONS

by

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THESIS

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by

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Abstract

BACKGROUND: Obtaining and maintain employment can be a significant challenge for individuals with disabilities, including cardiac and other conditions of the circulatory system.

Although federal vocational rehabilitation laws allow for each state to provide various services, it is not well understood which services make a difference in employment rates, or how receipt of cash and medical benefits affect the rate of employment as well.

SUBJECTS: Data points regarding 4,475 state vocational rehabilitation consumers were extracted from an archival database controlled by US Department of Education containing demographic covariates, specific vocational rehabilitation services used, and final employment outcome.

METHOD: A hierarchical logistic regression analysis was utilized using vocational rehabilitation services as predictors to predicting employment for consumers with a cardiac and/or circulatory system disability.

RESULTS: A total of 2,616 out of 4,475 cardiac consumers (58.5%) were competitively employed after receiving vocational rehabilitation services. Logistic regression analysis results indicated that cash benefits (OR = 0.34; 95% CI: 0.3-0.4) were negatively associated with employment, whereas on-the-job supports (OR = 4.25; 95% CI: 3.51-5.16), diagnosis and treatment (OR = 1.69; 95% CI: 1.45-1.96), on-the-job training (OR = 1.91; 95% CI: 1.2-3.04), job placement assistance (OR = 1.7; 95% CI: 1.43-2.03), and maintenance (OR = 1.95; 95% CI: 1.58-2.39), and the “other services” category (OR = 1.3; 95% CI: 1.1-1.54) were significant predictors of positive employment outcomes.

DISCUSSION: Vocational services offered by state vocational agencies have been found to positively benefit individuals with a cardiac or other circulatory condition disability by assisting with obtaining or maintaining employment.

Keywords: cardiovascular disease, vocational rehabilitation, RSA – 911, logistic regression.

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CHAPTER ONE

Introduction

Most workers with cardiovascular disease have the physical capacity for return to work (RTW) following recovery from cardiovascular disease episodes. Work can even be a desired activity for the individual, with the potential to be a normalizing force in the recovery.

Rehabilitation ideas have evolved, over time, to discourage rest and promote activity resumption and reengagement in social roles, with work being one of the more important roles. Many workers, though, do not return to or sustain work; many workers will reduce work involvement, become disabled and/or prematurely retire (O'Hagan, Coutu, Thomas, & Mertens, 2012).

Disability, once defined by the Social Security Administration as simply possessing the inability to work (U.S. Government Accountability Office, 2007), is now commonly defined as being "a medically diagnosable physical or mental impairment" that limits an individual's functioning (Rubin & Roessler, 2007). The precursors of disability resulting from a cardiac condition can be described, as observed in the related literature, as being multifactorial in nature, with not one sole cause of the condition. O'Hagan and others (2012) have found that current research demonstrates that physical capacity and disease severity are not primary determinants of return to work (O'Hagan et al., 2012). Mark and others (1992) found that individuals with coronary disease who are at high risk for leaving the work force early, after an event or diagnosis, can be accurately identified from a combination of medical and non-medical risk factors (Mark et al., 1992). Disability is produced by individual physical and psychological factors interacting with work and workplace factors (including relationships, policies and procedures), compensation and insurance system factors, and healthcare system factors, including professionals and programs (O'Hagan et al., 2012).

While the incidence of coronary heart disease and myocardial infarctions (heart attacks) have declined across the Western world, there is still a large number of myocardial infarctions that occur in people in working age. Following a heart attack, many workers may become disabled, with the consequences of their illness discouraging them from returning to paid employment (Brink, Brändström, Cliffordsson, Herlitz, & Karlson, 2008).

The goal of the research at hand is to explore the data collected at case closure from the country's numerous vocational rehabilitation services agencies in order to determine if receipt of cash benefits may be a disincentive, thus discouraging, for returning to competitive employment. In addition to exploring the effect of cash benefits on vocational service case closure outcomes, the current study will also examine which specific vocational rehabilitation services are associated with returning to or maintaining competitive employment of individuals with cardiac and other conditions of the circulatory system.

CHAPTER TWO

Review of the Literature

Cardiovascular Disease – Medical Aspects

Cardiovascular disease is a generic term used to describe several diseases that affect the cardiovascular system (the heart and arteries, including coronary vessels), in addition to the cerebrovascular, renovascular, and peripheral arterial systems (Stewart, Inglis, & Hawkes, 2006). Cardiovascular disease is characterized by the restriction or blockage of regional arteries, leading to possible tissue damage (Stewart et al., 2006). Currently, cardiovascular disease overall is the single largest killer of humans throughout the world, with a death rate of 254.1 per 100,000 in the United States recorded for 2006 (Roger et al., 2011). Roughly one out of every three deaths in the US can be attributed to stemming from a cardiovascular disease endpoint (such as coronary heart disease, stroke, or heart failure), with 2,150 Americans dying per day, or one death every 40 seconds (Go et al., 2014; Stewart et al., 2006). It is estimated that 83.6 million Americans (approximately equivalent to more than one out of every three people) have at least one type of cardiovascular disease, which includes, high blood pressure and coronary heart disease, the successor to the development of coronary artery disease. Coronary heart disease is generally an etiological factor in the development of myocardial infarctions, heart failure, angina pectoris, and even stroke. It is important to note many of the cardiovascular diseases overlap, thus making accurate estimates of prevalence difficult to ascertain (Go et al., 2014; Roger et al., 2011; Stewart et al., 2006).

Coronary heart disease, which can manifest as the hallmark symptoms of an acute myocardial infarction or heart failure, is estimated to affect 15.4 million Americans. Alone, coronary heart disease caused about one out of six deaths in America during 2010, compared to

stroke causing approximately one out of nineteen deaths for the same time period (Go et al., 2014). While hypertension may be the most prevalent cardiovascular disease, coronary heart disease is the most lethal of the diseases, ruled most commonly as the cause of death. In addition to being lethal, coronary heart disease, combined with myocardial infarctions and heart failure, allow for cardiovascular disease in general to be listed among the most common causes of disability among older adults, as well as increasing comorbidities and decreasing health-related quality of life (Keib, Reynolds, & Ahijevych, 2010; Messinger-Rapport & Sprecher, 2002).

Angina pectoris, generally a nonlethal event but nevertheless a symptom of coronary heart disease, is characterized by chest pain or discomfort resulting from insufficient blood flow and oxygenation of the heart muscles. Chest pain can be predictable as it is related to physical exertion or mental and emotional stress, thus can be classified as being stable, not always ending in a myocardial infarction. For the year 2010, angina pectoris had an estimated prevalence of 7.8 million and an incidence rate of 565,000, for people equal to or greater than 20 years of age.

Coronary heart disease is considered a chronic disease, with a prevalence of around 22% among Americans over age 65 specifically (Keib et al., 2010), but a prevalence of 6.4% of the total adult population over the age of twenty, with estimates for the year 2030 growing for this group to an estimated 18%. Looking at the coronary heart disease endpoint of myocardial infarction for incidence rate, estimates predict that each year, approximately 620,000 Americans, equal to or greater than age 35, will have a new coronary attack, either a myocardial infarction requiring hospitalization or a death caused by coronary heart disease (Go et al., 2014). O'Hagan and others (2012) wrote that fifty percent of myocardial infarctions occur in individuals under the age of 65, within the working age; two-thirds of these individuals will survive the cardiac episode (O'Hagan et al., 2012). Almost one out of five acute myocardial infarctions happen to

people ages 18 to 55 years old, well within the working years, with 39% occurring to women (Lindau et al., 2014). Further, 295,000 individuals will have a recurrent attack, and an additional 150,000 will have a silent myocardial infarction. The total new and recurrent infarctions without death is 720,000 (Go et al., 2014).

The overall death rate for coronary heart disease and cardiovascular disease as a whole has been falling since at least 1968, attributed to diagnostic improvements, medical and surgical treatments versus lifestyle modifications, and quicker first response times and hospitalization rates (Go et al., 2014; Pandya, Gaziano, Weinstein, & Cutler, 2013). This decrease in the death rate is leading to more survivors, but additional people with functional limitations. Survivors of a coronary heart disease event can experience dyspnea, decreased exercise tolerance, and angina pectoris as continued symptoms (Messinger-Rapport & Sprecher, 2002). The growing divide in mortality versus prevalence indicates that the burdens of cardiovascular disease and coronary heart disease, such as increased costs and lower quality of life, are projected to become worse over the next several years (Pandya et al., 2013). Current research is supporting the fact that while more Americans are living longer, post myocardial infarction, with coronary heart disease than in decades before, they are underutilizing medical and rehabilitative resources, such as medication or cardiac rehabilitation programs (Go et al., 2014; Messinger-Rapport & Sprecher, 2002; Wenger, 2008), even when participation eligibility is not a factor (Keib et al., 2010; Suaya et al., 2007).

Work for Life

Work has been identified as a means for fulfilling basic human needs. Additionally, work is seen as being critically important to an individual's financial, psychological, and emotional well-being, as well as playing a role in developing an individual's self-esteem, and

social status (Baldwin & Brusco, 2011; Dutta, Gervery, Chan, Chou, & Ditchman, 2008). Work is also described as being linked to an individual's identity, self-esteem, self-worth, and self-concept, as well as impacting an individual's social relationships along with providing a means for psychosocial support (Chan et al., 2008). Work's role is especially evident when comparisons are made between individuals working and those that are not working, as seen by the higher rates of depression, anxiety, and alcohol use disorders, along with a lower reported quality of life and overall self-esteem, evident in the latter group (Dutta et al., 2008). Work can also provide an individual with his or her personal sense of achievement, independence, freedom, and security (Baldwin & Brusco, 2011). Returning to work following a cardiovascular incident, such as a diagnosis of acute coronary syndrome or a coronary artery bypass, is a crucial indicator of a successful functional rehabilitation and a greater quality of life (Worcester et al., 2014). Following a heart attack, physiological and medical implications, along with psychological factors, can affect the quality of life for workers, especially when the goal of a successful rehabilitation is defined as returning to work with no loss in status of income-producing capabilities (Cay, Vetter, Philip, & Dugard, 1973).

Cardiovascular Disease and Work – Facilitators, Barriers, Employment Rate

Although Dickson and others (2012) reported that more than 3.5 million American have work limitations, and thus increased disability, due to cardiovascular disease, there are few studies in existence that provide guidance to clinicians regarding employment supports following a diagnosis of cardiovascular disease. Disabling factors impacting employment of individuals with cardiovascular disease, especially those following a myocardial infarction, include decreased physical capacity and incapacitating symptoms, both stemming from recurrent chest pain, shortness of breath, and dizziness (Dickson, Howe, Deal, & McCarthy, 2012). Angina

pectoris, another symptom for example, has been shown to be negatively associated with a successful return to work, (Abbas, Brodie, Stone, & Cox, 2004; Brink et al., 2008), becoming a reason many individuals (23%) are not being able to return to work six months out from a myocardial infarction (Abbas et al., 2004). The symptoms can be magnified with employment that requires any physical exertion. Workers with cardiovascular disease are also affected by their employers' demands and work environment, such as by having to work long hours under stressful situations with ever-increasing workloads. Work stress and job strain is known to impact workers through various pathways, including biological as well as psychological, especially adverse on the health of workers with cardiovascular disease (Dickson et al., 2012). In addition, unnecessary inactivity followed by a failure to return to work can stem from a misinterpretation of symptoms, such as a chest-wall strain from angina (Wigle, Symington, Lewis, Connell, & Parker, 1971).

For Mæland and Havik (1987), although 72.7% of their population had returned back to work by six months following a myocardial infarction, 24.9% remained on sick leave with another 3.4% withdrawing from the workforce, or retiring altogether. The barriers found to have impacted a successful return to employment, as seen in this study, included marked hopelessness, high levels of sensitization, anxiety and depression (as reported during hospitalization), and patients' general knowledge about myocardial infarctions and coronary heart disease in addition to their own personal medical status.

Cay and others (1973) found that residual physical symptomology, angina, and severe breathlessness were all barriers impacting an individual's ability to return to work four months following a myocardial infarction. Patients with angina, for example, experienced more difficulties with returning to work within four months, as compared to patients without. Overall,

52% of the sample from this study was working within four months of the heart attack (Cay et al., 1973).

Worcester and others (2014) conducted a twelve-month prospective longitudinal study, assessing patients hospitalized with a diagnosis of acute coronary syndrome or patients that underwent a coronary artery bypass graft. The patients also had to have been working within two months of the hospitalization. These patients were assessed at four and twelve months following the hospitalization, with the initial assessments consisting of semi-structured interviews and self-report questionnaires; follow-ups consisted of measuring occupational outcomes as well as measuring attendance at a cardiac rehabilitation program. Depression and anxiety were measured using the 14-item Hospital Anxiety and Depression Scale (HADS). Resumption of work at any time during the year was considered “employed,” versus being classified as “unemployed” or “retired.” The barriers discovered, which in turn can be predictive in application to future individuals, included medical barriers (such as a history of past angina or the presence of comorbid illnesses, other than diabetes) to cognitive and psychological barriers (to include uncertainties about return-to-work options or an overall lack of interest in returning to work). The results indicated that there was a significantly less chance of non-return to work in patients that were not intending to return to work, or that were uncertain about returning to work ($p = <.001$). There was also a significant chance of a failure to return to work in patients with a comorbid condition other than diabetes ($p = .005$), in patients that perceived themselves to be in financial stress ($p = .035$), and in patients that had a negative perception of their health ($p = .045$).

Currently not found in contemporary research are studies listing specific vocational rehabilitation aims, or facilitators, targeted to cardiovascular patients, following a specific

cardiovascular episode, such as a heart attack. One such study was O'Hagan and other's (2012) twelve participants from an automobile manufacturing plant in south central Ontario, Canada. The twelve participants in this study were all males, between the ages of 43 and 63 years of age. This study was a qualitative case study method, assessed through longitudinal in-depth interviews with workers returning to work following a disabling cardiac illness. The participants' workplace and its demands were assessed through site visits and meetings with the various stakeholders, including occupational (company) health personnel. The data was analyzed using constant comparison and progressive coding. The results showed that medical advice from doctors, as it pertained to work activities, was less valued when it lacked considerations of work conditions, thus the workers did not follow doctors' orders when the doctor appeared to not understand what the work entailed (O'Hagan et al., 2012). The above researchers also found that *cardiac rehabilitation* (defined as the totality of activities and psychosocial factors that favorably influence the underlying cause of the cardiovascular disease which lead to the cardiac event (Komorovsky et al., 2008)) lacked the intensity and relevance to work demands because it focused on changing the individual's lifestyle and increasing physical capacity. Interestingly, the occupational health doctors and staff were found to be reassuring for workers, and these providers also played an important role in developing return to work plans by possibly leading to more adaptive illness representations and reduced fear, resulting in better adjustment to the workplace. The overall findings highlighted that while cardiac rehabilitation programs were beneficial for lifestyle modification and increasing exercise capacity, they had limited benefit on work reintegration (O'Hagan et al., 2012).

In a 2008 paper, Brink and others assessed 88 Swedes (23 females) with an average age of 57, with no one older than 65. The method was to administer questionnaires at specific times

following a myocardial infarction. The first encounter was one month out, with the focus on obtaining demographic information, consent, and a detailed work history. The second encounter, four months out, entailed questioning health and mental status. When the last encounter occurred, at five to six months out, physical activity and current work status was measured. At each interval, the questionnaires measured physical, mental, and social functioning, along with somatic health complaints generally associated with myocardial infarctions. The researchers found that the participants that did not return to work scored lower on variables related to the physical dimension of health-related quality of life and on physical activity. Also, logistic regression showed that a multivariate model including age, physical dimension of health-related quality of life and footsteps per day predicted return to work in 68% of all cases, thus low physical health and activity after myocardial infarction negatively affect returning to work (Brink et al., 2008).

Vocational Rehabilitation Services

Work has been viewed as being a basic human right, especially for individuals with disabilities, by those within the field of vocational rehabilitation. Thus, the primary impetus for vocational rehabilitation counselors is to assist individuals with disabilities to gain or regain employment or other meaningful activity, eventually leading to increased independence and self-reliance (Chan, Cheing, Chan, Rosenthal, & Chronister, 2006; Dutta et al., 2008; Rubin & Roessler, 2007). Vocational rehabilitation has been known to play a potential role in the return to work processes, including employment facilitation and career development, of various types of chronic health conditions (Strauser et al., 2010). Wigle and others (1971) followed up with 112 patients who had previously suffered a myocardial infarction. The researchers found 11% of their sample, all under the age of 64 and working prior to the infarction, ended up being

unemployed for various reasons several months after the event. The authors listed the principal reasons as “adequate medical grounds for unemployment” versus “inadequate medical grounds for unemployment,” a reason that included individuals encouraged by outside sources to draw an early pension, in addition to individuals suffering from a comorbid condition. For the individuals that had returned to work, the authors found that cardiac-appropriate vocational rehabilitation reduced unemployment significantly, allowing for at least a 50% reduction, and was economically a sound investment from society in addition to being a benefit to the individual’s family (Wigle et al., 1971).

In discussing the above study, Wigle and others (1971) recommended that early vocational assessment is key in order to prevent unnecessary disability, giving the example of a physician taking the needed time to discuss the significance of an infarction in relation to the physical demands of a patient’s particular social and vocational way of life. Further, the authors opined that a vocational assessment, in conjunction with an expert cardiac evaluation, be conducted prior to classifying any patient as unemployable (Wigle et al., 1971), especially important considering that impact on the nation’s overall economic burden that fewer working-age adults would bring if inadequately labeled as being disabled from heart disease (Phillips, Harrison, & Houck, 2005).

In addition to an initial vocational assessment, a multitude of vocational rehabilitation services, from basic academic remedial courses to employment of expert diagnosis and treatment to paying for restoration of physical and/or mental health with appropriate therapy, can aid individuals with chronic disabilities, including cardiac-related disabilities, in returning to gainful employment as well as career development (Chan et al., 2006; Strauser et al., 2010). Each of the 50 states within the United States, in addition to several US territories, has a department or state

agency devoted to providing vocational assessment and assistance to individuals with disabilities using the state-federal vocational rehabilitation program (Chiu et al., 2014; Strauser et al., 2010). Each agency is responsible for assisting individuals with disabilities, who also possess a desire to return to work, prepare for entering work, or, in some cases, a desire to maintain and continue working when obstacles occur but accommodations are needed. Each agency is also tasked by the federal Rehabilitation Act of 1973, along with subsequent amendments, with providing comprehensive supports that are consistent with the individual's current physical and psychological limitations, following a thorough investigation into eligibility criteria by a vocational rehabilitation counselor in order to integrate individuals with disabilities into occupational positions at the highest level possible (Chan et al., 2006; Chiu, Chan, Bishop, da Silva Cardoso, & O'Neill, 2013; Dutta et al., 2008; Strauser et al., 2010).

During the fiscal year 2005, the state vocational rehabilitation agencies ($N = 80$), as administered by the federal Department of Education's (DOE) Rehabilitation Services Administration (RSA), collectively received \$2.6 billion from the federal government, to spend on a variety of supports, including but not limited to counseling, placement, diagnosis, treatment, vocational training, and postsecondary education in order to serve about 1.2 million people (Dutta et al., 2008; U.S. Government Accountability Office, 2007). Each state or territory has at least one agency focused on helping individuals with disabilities to prepare for and obtain employment, with some jurisdictions having two agencies due to state laws regarding separate services for the blind and visually impaired (U.S. Government Accountability Office, 2007). Overall, these services have about a 60% success rate in employment of individuals with disabilities, with those suffering from a sensory or communicative disorder having the greatest chance of success in finding work. Each individual case outcome is reported by the state agency,

on an annual basis, to the DOE via a “case service report” (Chan et al., 2006; Dutta et al., 2008). The eligibility for an individual is based on having a disability that substantially impairs the individual’s ability to be employed, such as causing difficulties with obtaining, retraining, or preparing for employment at a level that is consistent with the individual’s capacity and ability (Strauser et al., 2010).

Previous research using “case service report” outcomes has shown a successful case closure (i.e. at least 90 days of competitive employment) rate of between 60% to 62% when multiple disabilities are accounted for (Bolton, Bellini, & Brookings, 2000; Dutta et al., 2008). Research into specific disabilities has found employment success rates of 48.1% for patients with multiple sclerosis (Chiu et al., 2013), 53.7% for survivors of cancer overall with 51.6% success in survivors aged 18 to 25 years old (Chiu et al., 2014; Strauser et al., 2010), and 56% for orthopedic disabilities (Chan et al., 2006). More than one of these studies indicated that receipt of cash or medical benefits, prior to vocational intervention and during, was associated with lower employment following conclusion of services, thus leading to a reduced chance of a successful case closure (Chiu et al., 2013; Dutta et al., 2008; Strauser et al., 2010).

Bolton, Bellini, and Brookings (2000) hypothesized that job placement services in general were the greatest contributor for individuals with various disabilities becoming competitively employed (Bolton et al., 2000). In addition to job placement services, other vocational services shown to be a significant predictor of positive employment outcomes for populations other than cardiac-related individuals include assistive technology services, job readiness, maintenance services, medical care and diagnosis for acute conditions, on-the-job supports, substantial counseling and guidance, transportation assistance, and vocational or university-level training (Chiu et al., 2014, 2013; Dutta et al., 2008; Strauser et al., 2010).

Purpose of present study and Hypotheses

Although cardiac and other conditions of the circulatory system, collectively, are argued to be the largest killer of humans (Roger et al., 2011), there is little research exploring returning to work after onset of cardiovascular-related disability from a vocational standpoint, as evidenced above. Just a handful of studies exist that explore vocational rehabilitation case outcomes for individuals with disabilities from a national perspective (Chan et al., 2008, 2006; Chiu et al., 2014, 2013; Dutta et al., 2008; Strauser et al., 2010); none of these studies address cardiac and other conditions of the circulatory system and vocational rehabilitation.

Research has shown that barriers to employment for people with disabilities can include lack of emotional support, depression (or other co-psychiatric disorder such as co-occurring alcohol abuse), and an overall need to reevaluate life priorities (Chan, Strauser, Maher, Robin, & Ebonee, 2010; Chiu et al., 2014). In addition to the biopsychosocial stressors listed prior, one of the primary barriers to gainful employment for people with disabilities is having to perform a cost-benefit analysis on returning to work versus the possibility of losing cash benefits (Chan et al., 2006), which can occur if a greater than a substantial amount is earned, such as when the cash benefit received is from the Social Security Administration (United States. Government Accountability Office, 2007). Shrey and Mital (1994) saw barriers of returning to work after a coronary heart disease episode to mostly stem from an incongruence between an individual's functional capacity and their job demands. The two researchers then proposed that a simple, cost effective, facilitator to maintain employment would be for the employer to offer a transitional return to work program (Shrey & Mital, 1994).

Many of the current known facilitators for returning to work, or maintaining employment, for individuals with disabilities, including individuals with cardiac conditions, can be services

offered by state vocational rehabilitation agencies, such as counseling, job placement, or assistance with acute treatment to improve physical functioning (Mital & Mital, 2002; Phillips et al., 2005; Shrey & Mital, 1994; Strauser et al., 2010). Even with the few facilitators known to impact a return to gainful employment, identifying which programs or services offered by state agencies is limited (Chan et al., 2010; Chiu et al., 2014), especially for cardiac patients.

In addition to hypothesizing that a significant interaction exists between receipt of income benefits and employment outcomes for cardiac patients, Shrey and Mital, in their discussion, also opined that cardiac diagnoses and treatments continue to evolve from a medical standpoint but that vocational rehabilitation planning and decision-making have continued to remain largely subjective for those involved, with little to no evidence-based guidance. The two authors also lauded the importance of vocational rehabilitation efforts for cardiac patients, especially in the vocational assessment process (Shrey & Mital, 1994). Overall, vocational rehabilitation has the potential to be the greatest factor in returning a person with a disability, such as a cardiac condition, back to work due to the various services that the vocational rehabilitation counselor has access to and their expert ability to facilitate employment and/or career growth (Chan et al., 2008; Chiu et al., 2014).

Based on the findings and the ideas presented in the above research and discussions regarding individuals with disabilities other than cardiac, the study at hand will use the most-recent data collected and published by the Rehabilitation Services Administration in order to investigate two hypotheses.

Hypothesis I

It is hypothesized that the data collected from individuals with cardiac and other circulatory conditions will confirm that receipt of cash and medical benefits are a disincentive barrier to returning to competitive employment, and thus less likely to return to competitive employment.

Hypothesis II

The current study has also postulated that of the many different vocational rehabilitative services that could potentially be offered, the following services, when offered, will be predictive of a successful return to competitive employment, and therefore facilitating a successful vocational rehabilitation case closure: assistive technology, job readiness training, maintenance services, medical care and diagnosis for acute conditions, on-the-job supports, substantial counseling and guidance, transportation assistance, and vocational or university-level training.

CHAPTER THREE

Method

For the study at hand, data will be extracted from the United States Department of Education (DOE), Rehabilitation Services Administration (RSA) database labeled RSA – 911. This specific database is a large archival database that is updated annually using data points collected at case closure and then submitted to RSA by each vocational rehabilitation entity. The most current dataset, representing the year 2011 with a sample size of 4,475, will be used for the purposes of analysis. The dataset will contain the entire number of individuals serviced and reported by each agency with a cardiovascular-related disability, among other disabling conditions, whose cases were closed with either a “successful” or “unsuccessful” rehabilitated status in the most current year reported. The rehabilitation status is determined at the closure, or termination, of vocational rehabilitation services. Successful rehabilitation is defined as being placed in competitive employment for at least 90 days while, conversely, an unsuccessful case closure would occur when no placement into competitive employment occurs following administration of vocational rehabilitative services.

In addition to case closure status, each case will also indicate which specific vocational services were administered, which include various types of vocational guidance, counseling, or assessment and referral services, as explained in the appendix below. Lastly, along with each case closure from RSA – 911, there will also be demographic characteristics (including items such as age, gender, race, level of education, etc.) of the individuals.

Statistical Analysis Plan

The proposed plan is to extract, then analyze, demographic characteristics and vocational service patterns from the dataset, with the overall aim for this proposal to identify which

vocational rehabilitation services can help individuals with cardiac and other types of circulatory system conditions. Certain demographic covariates (including gender, age at intake, education, race/ethnicity, type of major impairment) listed in the table below, will be controlled for and used as predictor variables in addition to the number of government, medical, or cash benefits the individual is receiving, such as Social Security Disability benefits, Temporary Assistance for Needy Families (TANF), or benefits from private sources (i.e. workers' compensation or short and/or long term disability). A second set of predictor variables to be analyzed will also include each of the types of vocational rehabilitation services currently offered.

The latest version of SPSS, a statistical analysis software designed by IBM, will be used for the proposed hierarchical logistic regression analysis to examine the effect of demographic covariates, work disincentives, and vocational rehabilitation services on employment outcomes of individuals with cardiovascular injury.

Competitive employment, as described by the RSA – 911 manual, will be the dependent outcome variable. Competitive employment is defined as employment for at least 90 days in either an integrated, self-employment, or a state-managed Business Enterprise Program (BEP) setting. The employment must be performed on a full-time or part-time setting, with at least 8 hours per week worked in some jurisdictions. Unsuccessful case closure outcomes are cases where no competitive employment could take place during the planned vocational rehabilitation program.

The independent predictor variables will be demographic (such as gender, race, co-occurring disability), work disincentives (cash benefits), and types of vocational rehabilitation services (i.e. assessment, on-the-job training, assistive devices, etc.). It is important to note that RSA – 911 does not specify that an exact heart or circulatory system diagnosis be reported, only

that it falls under the category of “Cardiac and Other Conditions of the Circulatory System.” In summation, the following research questions will be addressed in the study at hand:

- 1) How do demographic variables and the provision of cash or medical benefits (such as from SSDI, workers’ compensation, or medical insurance not through employment) relate to employment outcomes of unemployed individuals with cardiac and other conditions of the circulatory system, following vocational rehabilitation services?
- 2) Which, if any, specific vocational rehabilitation services are directly related to employment of individuals with cardiac and other conditions of the circulatory system who received state vocational rehabilitation services?

CHAPTER FOUR

Results

Descriptive statistics

The current sample consisted of a total 4,475 individuals, or consumers of state vocational rehabilitation services, that had “cardiac or other conditions of the circulatory system” listed as the primary diagnoses leading to a disability. Of this total sample, 2,616 consumers (58.5%) were competitively employed after receiving state vocational services, up from the 1,101 (24.6%) that reported being competitively employed at application. In regards to gender, men were heavily represented in the total sample with 2,913 (65.1%) consumers; there were 1,562 women (34.9%). The average age of the cardiac consumer was 47.73 years ($SD = 13.14$), with the majority of consumers (4,245; 94.9%) falling under the working age of 65 years old. The youngest consumer would have been no younger than 16 years old, per state vocational guidelines.

The racial and ethnic backgrounds of the cardiac consumers consisted of 2,956 (66.1%) people described as European American (white), 1,054 (23.6%) as African American, and the remaining 10.3% of the sample comprised of Hispanic ($n = 340$), Asian ($n = 66$), and Native American ($n = 59$). Almost all of the consumers were listed as having a physical impairment as their major impairment class (4,378; 97.8%). As far as describing education level, the consumers reported having a high school diploma (1,829; 40.9%) or an associate degree (1,420; 31.7%) a majority of the time, with bachelors degrees or higher consisting of only 10.5% of the sample (Table 1).

With regard to receiving cash and/or medical benefits at the time of application, 1,219 consumers (27.2%) reported actively receiving Social Security Disability Insurance or

Supplemental Security Income, and 228 consumers (5.1%) reported receiving COBRA benefits. Alternatively, a total of 1,101 (24.6%) of the sample was employed at the time of application. When reviewing the 2,616 consumers at case closure that were closed as “competitively employed,” there was a strong correlation observed between weekly earning at application and at closure ($r = .549, p < .001$), while the relationship between work hour at application and closure was weak ($r = .290, p < .001$).

At the time of application, the average weekly earning for a consumer was \$108.41 (SD = \$283.51) for an average of 7.4 hours worked (SD = 15.1), as compared to the average earning at case closure of \$469.93 (SD = \$358.34) from 33.6 working hours. Of the 4,475 total cardiac sample size, the average number of services received by consumers was 3.95, at an average total cost of \$3,491.15 per case ($M = \$1,166$; $SD = \$7,259.95$). With regard to the length of open vocational rehabilitation case for patients with a cardiac-related disability, the average time span from open to close was 742.61 days, with a standard deviation of 694.33 days.

The top public support or medical insurance benefits that cardiac consumers received were SSDI (23.3%), Medicaid (17.9%), and private insurance through employment (16.9%), with Medicare (16.5%) rounding out the top four. Out of the twelve public support and medical insurance programs listed, there was only one service that did not show a significant relationship with employment status following vocational rehabilitation intervention: workers’ compensation. The other eleven services, including SSDI, SSI, Medicare, and employer-based benefits, all had significant relationships with employment outcomes (Table 2).

The three most frequently used vocational rehabilitation services were comprehensive assessment (67.6%), vocational counseling and guidance (67.2%), and diagnosis and treatment of impairments (57.5%). Among the services received by greater than 5% of the sample, ten

services were found to have a significant relationship with employment status: assessment, diagnosis and treatment, counseling and guidance, college or university training, job readiness training, miscellaneous training, job search assistance, on-the-job supports, transportation, and maintenance services. Except for college or university training, job search assistance, and transportation services, the other seven were used at higher rates among the competitively employed.

Logistic regression analysis

The logistic regression analysis worked by controlling for age, gender, race, level of education, and medical and social benefits, for each covariate. The Nagelkerke R^2 was calculated to be .270, thus indicating a moderate effect size and that 27% of the variances in employment outcomes can be explained by the predictor variables.

For step one, the demographic variables (to be controlled for in the second step) were the first set of variables entered into the analysis. These demographic variables included gender (with women as the reference category), age (with less than age 35 as the reference category), race/ethnicity (with European American as the reference category), education level (with college or greater as the reference category), and cash and medical benefits (with the negative response as the reference category). While gender was not a significant predictor of employment status, the age of the consumer was found to be a predictor. Cardiac consumers who were 65 years old and older had 2.02 times greater odds of becoming competitively employed after vocational services (odds ratio (OR) = 2.02; 95% confidence interval (CI): 1.44-2.84) than the odds of consumers between the ages of 16 to 34. Consumers without a college degree were shown to have between a 26% to a 73% reduction in odds of obtaining competitive employment at case closure, with each level lower than college reducing odds at a different rate than the next.

African Americans were 21% less likely to be competitively employed following vocational services (OR = 0.79; 95% CI: 0.68-0.92) in this study. While receipt of cash benefits reduced the odds of competitive employment by 72% at case closure (OR = 0.28; 95% CI: 0.25-0.32), receipt of medical benefits conversely increased the odds of working in a competitive setting almost two-fold (OR = 1.97; 95% CI: 1.72-2.25) (Table 4).

During the second step, sixteen of the vocational rehabilitation services were added to the regression. The services that were utilized by less than 1% of the consumers (basic academic remedial or literacy training, augmentative skills training, reader services, interpreter services, personal attendant services, and technical assistance services) were not entered as predictors in the logistic regression analysis. While gender remained insignificant in this step, the age groups of 35-54 and 55-64 had a 32% and 27% less chance of finding competitive employment at case closure, respectively. The various lower levels of educational attainment, again, reduced the odds of competitive employment by 22% to 74%, when using a college degree as the reference group. As observed within the first step, African Americans experienced a significant odds reduction of 27% in terms of finding competitive employment. A consumer receiving medical benefits had almost a two and a half times greater chance of being competitively employed by case closure (OR = 2.5; 95% CI: 2.12-2.85) versus the significant 66% reduction in odds for someone receiving a cash benefit (OR = 0.34; 95% CI: 0.3-0.4).

After controlling for the effect of the demographic covariates, six vocational rehabilitation services were found to significantly increase the chances of obtaining employment. On-the-job supports were found to significantly increase the chances of competitive employment with the largest odds ratio of the group (OR = 4.25; 95% CI: 3.51-5.16). The other five services included diagnosis and treatment (OR = 1.69; 95% CI: 1.45-1.96), on-the-job training (OR =

1.91; 95% CI: 1.2-3.04), job placement assistance (OR = 1.7; 95% CI: 1.43-2.03), and maintenance (OR = 1.95; 95% CI: 1.58-2.39), and the “other services” category (OR = 1.3; 95% CI: 1.1-1.54). Three services were found to significantly hamper the chances of obtaining employment: college or university training with an odds reduction rate of 22% (OR = 0.78; 95% CI: 0.62-0.97), job search assistance with an odds reduction rate of 33% (OR = 0.67; 95% CI: 0.55-0.81), and transportation services with an odds reduction rate of 17% (OR = 0.83; 95% CI: 0.7-0.98) (Table 4).

CHAPTER FIVE

Discussion

In the current study, the successful employment rate for state vocational rehabilitation consumers with cardiac or other circulatory condition was 58% after receiving services. This rate is only slightly lower than the 62% overall employment rate for people of all disabilities (Chiu et al., 2013; Dutta et al., 2008). This study found that specific demographic factors (such as age, educational level, racial background), could impact the competitive employment success rate of a consumer, or patient, with a cardiac-related disability. When investigating the time that cardiac consumers spent in vocational rehabilitation services, this study found that the average was roughly 743 days, or about 25 months. While this is slightly longer than the time for the average vocational rehabilitation service consumer of 22 months (Haywood & Schmidt-Davis, 2005), it is still within a shorter time frame of other specific disabilities, such as 30 months for multiple sclerosis or 28 months for physical disabilities in general (Chiu et al., 2013; Dutta et al., 2008).

The current study found that after controlling for the effect of demographic covariates, vocational rehabilitation services significantly enhanced the employment outcomes for consumers, or patients, diagnosed with a cardiac other circulatory conditions. Much like prior research using the database RSA – 911, vocational services that increase the odds of competitive employment include on-the-job supports, diagnosis and treatment, on-the-job training, job placement assistance, and maintenance, and the “other services” category (Chan et al., 2008, 2006; Chiu et al., 2014, 2013; Dutta et al., 2008; Strauser et al., 2010).

As observed in research before, the current study found that receiving cash benefits (SSDI, SSI, etc.) negatively impacts the odds of obtaining competitive employment in the

vocational rehabilitation setting. A major deterrent for many people on public assistance of some type is the belief that cash benefits will immediately cease once any level of employment is obtained. This is especially evident when an individual has been on assistance of some kind for a substantial amount of time; during this time, the individual likely has become dependent on the monthly benefit check and has learned how to budget appropriately for a decent quality of life, thus is not interested in disrupting this reliable income and may choose to not explore other options for the fear of benefit suspension or cessation.

The idea of benefit suspension, though, is contradictory to programs set forth in the current law, such as the Ticket to Work and Work Incentive Improvement Act, in addition to the Social Security Administration's guidelines that allow for an enrollee to continue earning benefits so long as their work-based income is less than the substantial gainful activity (SGA) amount. As noted above in the review of literature, education is paramount to understanding "the system" and how to reap the most benefit; unfortunately, this education is not readily available thus possibly explaining why some vocational rehabilitation services are underutilized. Generally speaking, the higher the education level is, as shown with the current study, the better the odds are of finding successful employment, possibly highlighting a higher degree of understanding of social benefits.

While having a college education at the application process for vocational services was shown to provide a higher chance of competitive employment at case closure, it might be assumed that providing this service to a consumer with cardiovascular disease would result in a successful case closure; but that was not the case with the current study's findings. The results showed that by providing the service of college or vocational training, the odds of employment were reduced. This highlights the possibility that a secondary gain is interfering with a

successful outcome. When an individual decides to embark on a college degree, especially coming from a status of unemployment from a medical reason, he or she is further voluntarily removing him or herself from the job market, even if for a few years. For a cardiac patient already with a student loan, enrolling in a new college or vocational program may allow for previous loans to become deferred along with a host of other student-related benefits, thus encouraging a person to stay enrolled in school as long as possible. In addition to the other student benefits that may be possible, such as additional loan money, an individual may grow accustomed to the lifestyle of essentially choosing the work/study hours in terms of class scheduling and may not fare so successfully in a competitive-for-pay environment such as work.

The other services that were found to be of a detriment to a successful case closure rate included services such as transportation and job searching. When an individual needs assistance in the areas of interviewing skills or help with navigating the public transportation system of one's locality, this may be indicative of a consumer that needs a pronounced amount more support than the average vocational service consumer; thus, rates of competitive employment will likely be lower, as seen within this study. In addition, with these services likely being the lowest in cost, they may represent a service being used as a means to "test" the consumer, to see if the vocational rehabilitation system should invest further resources.

It is important to note that conversely to what has been found in prior research (Chiu et al., 2014; Strauser et al., 2010), receipt of medical benefits in the current study for the cardiac population was found to actually improve the odds of successful competitive employment. While this is contradictory in some ways to prior research, it may be explained by the nature of the systemically pervasive symptomology that cardiac and other circulatory can lead to, in addition to how this diagnosis exists along a continuum. As detailed above in the literature

review, cardiac insults and injuries can include many conditions in addition to existing alongside other co-morbid conditions. With the increased medical dependence, patients with cardiac conditions would likely require continuous and uninterrupted medical support in order to stay at an employable condition.

Another significant finding in the current study was that cardiac consumers who were 65 or older had 2.02 times greater odds of becoming competitively employed after vocational services when compared to their younger counterparts. An explanation to this finding could be the result of a few factors. One, it is common knowledge that a number of the “baby boomers” are concerned at this time with uncertainty of skyrocketing medical costs in addition to an ever-increasing cost of living. Also of great importance to the American society as a whole, but particularly for those with disabilities, was the relatively recent downturn in the economy, resulting in early retirements and layoffs. That said, many individuals of a “traditional” retirement age are having to make the decision to return to the workforce in order to make ends meet, financially speaking, or as a way to get out of the house and into a more active lifestyle.

Not only are financial reasons getting individuals at retirement age back into the workforce, but so are the positive, psychologically-based, results of work, such as a means to elevate mood or self-esteem, or the social interaction that work generally provides. As highlighted above, work is found to have many positive qualities that cannot be continued when an individual with a disability decides to remove him or herself from the workforce, such as the interaction with others or the satisfaction that results from working for money. Lastly, recent studies are highlighting the fact, as pointed out above, that the aging population is living longer, thus some baby boomers are becoming caretakers for an older generation of people, their parents.

Taking on this responsibility can lead to a desire to leave the home during the day and become financially productive for the variety of reasons described above.

The current study specifically highlighted the importance of on-the-job supports, following a cardiac-related disability. This specific supportive service entails job coaching, follow-up, and follow-along services, which are generally very specific to the consumer's job tasks thus may be highly individualized. With the consumer becoming over four times more likely to be employed when the plan includes this service, regardless of demographics, special consideration may need to be taken from a vocational rehabilitation counselor's standpoint as they are generally the guiding force in devising the consumer's vocational plan. On-the-job supports, for this study, were in the higher-utilized range (25.9%), but nowhere near the top like assessment was (67.6%). Although underutilization could be explained by the fact that on-the-job supports are only added to the plan when the consumer is competitively employed, among employed consumers in this study, it was only used 36.5% of the time. In terms of the other five services that were shown to be significant predictors of employment, most, if not all, can be consisted the broadest service categories, such as assessment or diagnosis and treatment. These two categories alone can consist of a myriad of specific treatments or tests.

Finally, the importance of vocational rehabilitation services for individuals disabled, or experiencing difficulty with maintaining competitive employment, by a cardiovascular or related disease is evident with comparing the number of people employed at application ($n = 1,101$) versus the number at closure ($n = 2,616$). Considering that the affected age of the population continues to get younger and younger, as discussed before, in addition to advances in healthcare and medications, individuals will continue to rely on their respective state vocational rehabilitation agencies in growing numbers.

Limitations

Due to the fact that archival data was used for this study, along with employing an ex post facto design, causality cannot be inferred. Another limitation in this study was that the data was collected and transmitted to RSA through the case service report system by up to 4,475 different people, assuming each cardiac consumer in this study had an entirely different vocational rehabilitation counselor. It is up to the individual counselor to verify information that is transmitted, thus stressors from working under deadlines and within budgets may allow for transgressions, as minor as a few misplaced keystrokes that may impede the actual numbers reported in the dataset. Limitations like this, though, might be easily overcome by a devising a system that provides a data-integrity check, possibly by another case worker.

With the idea that governmental budgets determine how much funding goes into the vocational rehabilitation system, it would be prudent for future researchers to explore how much each different service costs, in addition to the total case cost. This would allow for cost-benefit analyses to be done that could ease the counselor in creating the most individualized plan, based on the services most likely to result in competitive employment thereby improving the successful closure rate.

Conclusions

Vocational services offered by the various state vocational agencies have been shown, in the current study as well as others, to benefit individuals with a cardiac or other circulatory condition disability with obtaining or maintaining employment. It is recommended that employment outcomes and vocational rehabilitation case closure information continue to be researched so that future consumers may benefit even greater than before from advanced analyses into what services work best and for whom.

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Table 1

Demographic characteristics

Variable	<i>n</i>	(%)	Mean (SD)
<i>Age</i>			47.73 (13.14)
16-34	689	(15.4%)	
35-54	2,261	(50.5%)	
55-64	1,295	(28.9%)	
65+	230	(5.1%)	
<i>Gender</i>			
Male	2,913	(65.1%)	
Female	1,562	(34.9%)	
<i>Race</i>			
European American	2,956	(66.1%)	
African American	1,045	(23.6%)	
Native American	59	(1.3%)	
Asian American	66	(1.5%)	
Hispanic American	340	(7.6%)	
<i>Education</i>			
Special Education	39	(0.9%)	
Less than high school	719	(16.1%)	
Completed high school	1,829	(40.9%)	
Post-secondary/associate	1,420	(31.7%)	
College degree or higher	468	(10.5%)	
<i>Type of major impairment</i>			
Sensory impairment	57	(1.3%)	
Physical impairment	4,378	(97.8%)	
Cognitive impairment	25	(0.6%)	
Psychosocial/Mental impairment	15	(0.3%)	
<i>Employment status at application</i>			
Yes	1,101	(24.6%)	
No	3,374	(75.4%)	
<i>Using SSDI or SSI at application</i>			
Yes	1,219	(27.2)	
No	3,256	(72.8)	
<i>Using COBRA at application</i>			
Yes	228	(5.1)	
No	4,247	(94.9)	
<i>Receiving cash benefits at closure</i>			
Yes	2,008	(44.9%)	
No	2,429	(54.3%)	

Table 1

Demographic characteristics - continued

<i>Case service variables</i>	
Time in days from application to close	742.61 (694.33)
No. of services	3.95 (2.09)
Case expenditures	\$3,491.15 (\$7,259.95)

Table 2

Receipt of public support and medical insurance coverage at time of closure

Type of support	Use Condition	All (n=4,475)		Employed (n=2,616)		Unemployed (n=1,859)		X^2 (df)	p
		n	%	n	%	n	%		
SSI	YES	431	(9.7)	128	(4.9)	303	(16.7)	168.06	0.00
	NO	3,991	(90.3)	2,476	(95.1)	1,515	(83.3)		
TANF	YES	44	(1.0)	14	(.5)	30	(1.7)	13.57	0.00
	NO	4,365	(99.0)	2,587	(99.5)	1,778	(98.3)		
GA	YES	110	(2.5)	30	(1.2)	80	(4.4)	46.79	0.00
	NO	4,302	(97.5)	2,571	(98.8)	1,731	(95.6)		
SSDI	YES	1033	(23.3)	403	(15.5)	630	(34.7)	220.33	0.00
	NO	3,391	(76.7)	2,203	(84.5)	1,188	(65.3)		
VA	YES	31	(.7)	8	(0.3)	23	(1.3)	14.18	0.00
	NO	4,381	(99.3)	2,593	(99.7)	1,788	(98.7)		
WC	YES	6	(99.9)	2	(.1)	4	(.2)	1.63	0.20
	NO	4,404	(.1)	2,599	(99.9)	1,805	(99.8)		
OPA	YES	234	(5.3)	108	(4.2)	126	(7)	16.77	0.00
	NO	4,177	(94.7)	2,493	(95.8)	1,684	(93)		
CAID	YES	794	(17.9)	302	(11.6)	492	(27)	172.65	0.00
	NO	3,636	(82.1)	2,304	(88.4)	1,332	(73)		
CARE	YES	731	(16.5)	339	(13)	392	(21.5)	56.38	0.00
	NO	3,698	(83.5)	2,268	(87)	1,430	(78.5)		
PINSURE	YES	94	(2.1)	47	(1.8)	47	(2.6)	3.09	0.08
	NO	4,338	(97.9)	2,560	(98.2)	1,778	(97.4)		
EMPINS	YES	748	(16.9)	714	(27.4)	34	(1.9)	495.55	0.00
	NO	3,670	(83.1)	1,891	(72.6)	1,779	(98.1)		

Table 2

Receipt of public support and medical insurance coverage at time of closure - continued

Type of service	Use Condition	All (n=4,475)		Employed (n=2,616)		Unemployed (n=1,859)		X^2 (df)	p
		n	%	n	%	n	%		
OTHRINS	YES	549	(12.4)	381	(14.6)	168	(9.2)	28.65	0.00
	NO	3,877	(87.6)	2,225	(85.4)	1,652	(90.8)		

Note: SSI: Supplemental Security income; TANF: Temporary Assistance for Needy Families; GA: general assistance; SSDI: Social Security Disability Insurance; VA: Veterans' Disability Benefits; WC: workers' compensation; OPA: other public support; CAID: Medicaid; CARE: Medicare; PINSURE: public insurance from other sources; EMPINS: private insurance through own employment; OTHRINS: private insurance through other means.

Table 3

Use of vocational rehabilitation services

Type of service	Use Condition	All (n=4,475)		Employed (n=2,616)		Unemployed (n=1,859)		X^2 (df)	p
		n	%	n	%	n	%		
<i>Assessment</i>	YES	3,026	(67.6)	1,882	(71.9)	1,144	(61.5)	53.719	.000
	NO	1,449	(32.4)	734	(28.1)	715	(38.5)		
<i>Diagnosis & treatment</i>	YES	2,572	(57.5)	1,736	(66.4)	836	(45)	203.442	.000
	NO	1,903	(42.5)	880	(33.6)	1,023	(55)		
<i>Counseling & guidance</i>	YES	3,007	(67.2)	1,841	(70.4)	1,166	(62.7)	28.872	.000
	NO	1,468	(32.8)	775	(29.6)	693	(37.3)		
<i>College & univ. training</i>	YES	510	(11.4)	247	(0.09)	263	(14.1)	23.829	.000
	NO	3,965	(88.6)	2,369	(0.91)	1,596	(85.9)		
<i>Occupational & voc. training</i>	YES	475	(10.6)	268	(10.2)	207	(11.1)	.908	.341
	NO	4,000	(89.4)	2,348	(89.8)	1,652	(88.9)		
<i>On-the-Job training</i>	YES	119	(2.7)	88	(3.36)	31	(1.67)	12.081	.001
	NO	4,356	(97.3)	2,528	(96.6)	1,828	(98.3)		
<i>Remedial/Lit. training</i>	YES	18	(0.4)	8	(0.31)	10	(0.54)	1.461	.227
	NO	4,457	(99.6)	2,608	(99.7)	1,849	(99.5)		
<i>Job Readiness training</i>	YES	406	(9.1)	217	(8.3)	189	(10.2)	4.615	.032
	NO	4,069	(90.9)	2,399	(91.7)	1,670	(89.8)		
<i>Augmentative skills training</i>	YES	27	(0.6)	21	(0.8)	6	(0.3)	4.175	.041
	NO	4,448	(99.4)	2,595	(99.2)	1,853	(99.7)		
<i>Miscellaneous training</i>	YES	326	(7.3)	173	(6.6)	153	(8.2)	4.207	.040
	NO	4,149	(92.7)	2,443	(93.4)	1,706	(91.8)		
<i>Job search assistance</i>	YES	941	(21.0)	512	(19.6)	429	(23.1)	8.040	.005
	NO	3,534	(79.0)	2,104	(80.4)	1,430	(76.9)		
<i>Job placement assistance</i>	YES	1,269	(28.4)	759	(29)	510	(27.4)	1.335	.248
	NO	3,206	(71.6)	1,857	(71)	1,349	(72.6)		

Table 3

Use of vocational rehabilitation services - Continued

Type of service	Use Condition	All (n=4475)		Employed (n=2616)		Unemployed (n=1859)		X^2 (df)	p
		n	%	n	%	n	%		
<i>On-the-Job supports</i>	YES	1,157	(25.9)	954	(36.5)	203	(10.9)	370.012	.000
	NO	3,318	(74.1)	1,662	(63.5)	1,656	(89.1)		
<i>Transportation</i>	YES	1,209	(27.0)	665	(25.4)	544	(29.3)	8.138	.004
	NO	3,266	(73.0)	1,951	(74.6)	1,315	(70.7)		
<i>Maintenance services</i>	YES	657	(14.7)	440	(16.8)	217	(11.7)	22.98	.000
	NO	3,818	(85.3)	2,176	(83.2)	1,642	(88.3)		
<i>Rehabilitation technology</i>	YES	204	(4.6)	125	(4.8)	79	(4.2)	.698	.403
	NO	4,271	(95.4)	2,491	(95.2)	1,780	(95.8)		
<i>Reader services</i>	YES	1	(0.0)	1	(0.00)	0	(0.00)	.711	.399
	NO	4,474	(100)	2,615	(100)	1,859	(100)		
<i>Interpreter services</i>	YES	13	(0.3)	7	(0.3)	6	(0.3)	.114	.735
	NO	4,462	(99.7)	2,609	(99.7)	1,853	(99.7)		
<i>Attendant services</i>	YES	5	(0.1)	2	(0.00)	3	(0.2)	.702	.402
	NO	4,470	(99.9)	2,614	()	1,856	(99.8)		
<i>Technical assistance</i>	YES	34	(0.8)	22	(0.8)	12	(0.7)	.551	.458
	NO	4,441	(99.2)	2,594	(99.2)	1,847	(99.3)		
<i>Info./Referral services</i>	YES	637	(14.2)	359	(13.7)	278	(15)	1.349	.245
	NO	3,838	(85.8)	2,257	(86.3)	1,581	(85)		
<i>Other services</i>	YES	1,016	(22.7)	602	(23)	414	(22.3)	.341	.559
	NO	3,459	(77.3)	2,014	(77)	1,445	(77.7)		

Table 4

Odds ratios of vocational services and employment

Independent variable	<u>Step one</u>		<u>Step two</u>	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
<i>Gender^a</i>				
Male	0.959 (0.838-1.097)	.542	0.956 (0.828-1.103)	.534
<i>Age^b</i>				
35-54	0.874 (0.723-1.058)	.167	0.675 (0.548-0.832)	.000
55-64	1.022 (0.831-1.258)	.835	0.734 (0.582-0.926)	.009
65+	2.019 (1.437-2.837)	.000	1.289 (0.890-1.865)	.179
<i>Education^c</i>				
Special Education	0.265 (0.126-0.557)	.000	0.262 (0.121-0.567)	.001
Less than HS	0.588 (0.452-0.765)	.000	0.602 (0.455-0.797)	.000
Completed HS	0.736 (0.584-0.927)	.009	0.780 (0.609-0.998)	.048
Associate Degree	0.642 (0.507-0.813)	.000	0.647 (0.502-0.834)	.001
<i>Race^d</i>				
African American	0.793 (0.681-0.922)	.003	0.731 (0.621-0.862)	.000
Native American	1.124 (0.651-1.940)	.676	1.197 (0.680-2.109)	.534
Asian American	0.512 (0.306-0.858)	.011	0.660 (0.384-1.133)	.132
Hispanic American	1.273 (0.989-1.637)	.061	1.261 (0.962-1.653)	.093
<i>Medical benefits^e</i>				
Cash benefits ^e	1.968 (1.719-2.254)	.000	2.460 (2.121-2.852)	.000
	0.282 (0.246-0.323)	.000	0.343 (0.295-0.399)	.000
<i>Assessment^e</i>				
			1.066 (0.914-1.244)	.414
<i>Diagnosis & treatment^e</i>				
			1.689 (1.453-1.964)	.000
<i>Counseling & guidance^e</i>				
			1.016 (0.870-1.188)	.838
<i>College/Univ. training^e</i>				
			0.775 (0.621-0.968)	.024
<i>Occ/Voc training^e</i>				
			1.089 (0.869-1.365)	.457
<i>On-the-job training^e</i>				
			1.911 (1.203-3.035)	.006
<i>Job readiness training^e</i>				
			0.888 (0.690-1.143)	.357
<i>Miscellaneous training^e</i>				
			0.809 (0.624-1.048)	.108
<i>Job Search assistance^e</i>				
			0.666 (0.546-0.813)	.000
<i>Job placement assistance^e</i>				
			1.702 (1.428-2.028)	.000
<i>On-the-job supports^e</i>				
			4.254 (3.511-5.156)	.000
<i>Transportation^e</i>				
			0.828 (0.700-0.980)	.028
<i>Maintenance^e</i>				
			1.946 (1.582-2.393)	.000
<i>Rehab Technology.^e</i>				
			1.291 (0.934-1.785)	.122
<i>Info & referral^e</i>				
			1.160 (0.947-1.420)	.153

Table 4

Odds ratios of vocational services and employment - continued

<i>Other services^e</i>	1.303 (1.102-1.541)	.002
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Note. a – using female as reference; b – using age 16-34 as reference; c – using college degree as reference; d – using European American as reference; e – response of “No” is reference

Appendix

Description of services provided by the various state vocational rehabilitation (VR) agencies.

Type of services	Service description
<i>Assessment</i>	Services and activities, provided and performed, in order to a) determine an individual's VR services eligibility, b) assign an individual to a priority category of a state VR agency that operates under an order of selection, and/or c) determine the nature and scope of VR services to be included in the Individual Plan for Employment (IPE); category also includes trial work experiences and extended eligibility evaluation.
<i>Diagnosis and treatment of impairments</i>	Surgery, prosthetics/orthotics, nursing services, dentistry, occupational/physical/speech therapy, and drugs and supplies; category also includes diagnosis and treatment of mental and emotional disorders.
<i>Vocational rehabilitation counseling and guidance</i>	Therapeutic counseling and guidance services necessary for an individual with a disability to achieve an employment outcome, including personal adjustment counseling; counseling that addresses medical, family, or social issues; vocational counseling; and other forms of counseling. This service is distinct and separate from the general counseling and guidance relationship that exists between the counselor and the individual during the entire rehabilitation process.
<i>College or university training</i>	Full-time/part-time academic training above the high school level that leads to a degree (associate, baccalaureate, graduate, or professional), a certificate, or other recognized educational credential; generally provided by a four-year college or university, community college, junior college, or technical college.
<i>Occupational/ vocational training</i>	Occupational, vocational, or job skill training (not leading to an academic degree or certification) provided by a community college and/or a business, vocational/ trade, or technical school to prepare students for gainful employment in a recognized occupation.
<i>On-the-job training</i>	Paid training in specific job skills by a prospective employer with the intent that individual will remain in the same or a similar job upon successful completion; category also includes apprenticeship training programs conducted or sponsored by the employer(s), or a joint apprenticeship committee representing employers and a union.

Appendix

<i>Basic academic remedial or literacy training</i>	Literacy training or basic academic skills remediation needed to function on the job in the competitive labor market.
<i>Job readiness training</i>	“Real world” training on topics to prepare individuals for various work environments (e.g. appropriate work behaviors, methods for getting to work on time, appropriate dress and grooming, methods for increasing productivity).
<i>Disability-related, augmentative skills training</i>	Category includes orientation and mobility, rehabilitation teaching, training in the use of low vision aids and communication (Braille, speech reading, sign language) and cognitive training/retraining.
<i>Miscellaneous training</i>	Any training not falling into one of the other categories listed, such as high school training leading to a diploma or GED.
<i>Job search assistance</i>	Job search activities supportive of a consumer in searching for an appropriate job, Category includes activities such as helping in resume preparation, appropriate job opportunity identification, and interview skills development. Category may also include acting on consumer’s behalf by making contacts with potential employers.
<i>Job placement assistance</i>	Interviewing for a specific job, following a referral from the VR counselor, regardless of interview outcome.
<i>On-the-job supports</i>	Support services provided to stabilize the job placement and enhance retention for an individual who has been placed in employment; includes such services as job coaching, “follow-up” and “follow-along” visits, and related job retention services.
<i>Transportation services</i>	Travel expenses needed to assist an applicant or eligible individual with participation in a VR service; category also includes training in the use of public transportation vehicles and systems.
<i>Maintenance services</i>	Monetary support provided for living expenses such as food, shelter, and clothing that are in excess of the normal expenses of the individual, and that are advantageous to the individual’s participation in an assessment for eligibility determination and specific VR needs or while receiving services under an IPE.

Appendix

<i>Rehabilitation technology</i>	Services that incorporate application of current technologies and engineering principles in order to meet the needs and address barriers experienced by individuals with disabilities in areas including education, independent living, rehabilitation, employment, transportation, and recreation; includes assistive technologies and devices alongside rehabilitation engineering and other technological services.
<i>Reader services</i>	Services for individuals with reading limitations due to visual impairments or other disabilities; includes reading aloud and transcription of printed materials into Braille or audio recordings; while typically offered to individuals who are blind or deaf-blind, these services may also be appropriate for individuals who cannot read due to various neurological insults or specific learning disorders.
<i>Interpreter services</i>	Services performed by providers trained in sign language or oral interpretation for individuals who are deaf or hard of hearing; also includes real-time captioning services and tactile interpretation services for individuals who are deaf-blind.
<i>Personal attendant services</i>	Bathing, feeding, dressing, mobility and transportation services, along with other personal services that an attendant performs for an individual with a disability.
<i>Technical assistance services</i>	Specialized technical assistance and other consultation services used for conducting market analyses, developing business plans, and providing resources to individuals with disabilities in the pursuit of self-employment, telecommuting, and/or small business operations.
<i>Information and referral services</i>	Using cooperative agreements with other agencies to refer out and serve individuals with disabilities in need of services outside of a VR program's direct reach.
<i>Other services</i>	Other services that are offered to individuals with disabilities that do not fit within the a category listed above, such as occupational licenses, tools and equipment for employment purposes, initial stocks and supplies for self-employment, as well as certain medical care that treats acute conditions arising out of the rehabilitation process or for treating chronic conditions that are the sole barrier to a successful case closure constituting a barrier to the achievement of an employment outcome.

BIOGRAPHICAL SKETCH

Juan “John” Camacho

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EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
The University of Texas at Dallas	B.A.	2006	Psychology (Crime and Justice Studies – Minor)
The University of Texas Southwestern Medical Center School of Health Professions	M.C.R.C.	2015	Rehabilitation Counseling Psychology

Positions and Employment

2015 Disability Case Manager at PRIDE, Inc in Rehabilitation Counseling Dept.
 2011 – 2012 Workers’ Compensation Adjuster for Sedgwick Claims Management Services
 2006 – 2011 Workers’ Compensation Adjuster for Liberty Mutual Insurance

Clinical Experience

08/2013 – 08/2014 Rehabilitation Counseling Student Intern for University Rehabilitation Services (URS) at UT Southwestern Medical Center
 02/2014 – 08/2014 Psychological Services Consult Liaison Intern at Children’s’ Medical Center
 08/2013 – 02/2014 Behavioral Health Outpatient Clinic & Psychology Assessment Services Intern at Parkland Health & Hospital System

Presentations and Publications

Camacho, J., Harding, M., & Zia, Z. (June 9, 2014). Somatic symptom presentation in an adolescent female. Children’s Medical Center Psychiatry/Psychology Consult Services Grand Rounds, Dallas, Texas

Professional Memberships

International Association of Rehabilitation Professionals (IARP); May 2014 – Present
 Newsletter Advisory Group Member (Aug 2014 – Present)
 Student Member of the Board of Directors, Co-Chair of the Student Advisory Committee to the President – Texas Chapter (Aug 2014 – Present)