

Losing Employment: At-Risk Employed Vocational Rehabilitation Applicants with Vision Loss

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Structured abstract: *Introduction:* Recent U.S. legislation supports vocational rehabilitation efforts to maximize employment and community integration of persons with disabilities by providing job retention and career advancement services. The study presented here investigated employed persons with visual disabilities who applied for vocational rehabilitation services. *Methods:* The sample included 4,499 competitively employed vocational rehabilitation applicants from the FY2015 RSA-911 report. Logistic regression was used to identify consumer characteristics and vocational rehabilitation services associated with losing competitive employment. *Results:* Employed applicants tended to receive assessment, counseling and guidance, diagnosis and treatment, and rehabilitation technology. Characteristics that put employed applicants at increased risk of losing their jobs included being female, having a secondary disability, working fewer hours, having less education, or having a previous unsuccessful vocational rehabilitation employment outcome. There was a significant interaction between vocational rehabilitation case length and age: those served for longer periods were more likely to lose employment, particularly older consumers. Consumers who received short-term on-the-job support, diagnosis and treatment of impairments, or rehabilitation technology services were more likely to retain competitive employment. *Discussion:* When developing rehabilitation plans for employed applicants, counselors may identify and attempt to provide services to address factors that put consumers at an increased risk of losing employment. Part-time employment at application is one risk factor that requires increased attention. *Implications for practitioners:* Prompt service delivery is an important factor in facilitating job retention. Increased efforts to maintain consumer contact and motivation may influence the likelihood of job retention among employed applicants.

Vocational rehabilitation services are designed to assist people with disabilities to

“maximize their employment, independence and integration into the community

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and the competitive labor market” (U.S. Department of Education, 2017). The Workforce Innovation and Opportunity Act (WIOA) renewed the commitment of the vocational rehabilitation program to provide job retention services, and it emphasized that persons with disabilities at “imminent risk of losing their jobs” will be prioritized for services (U.S. Department of Education, 2014). The WIOA also included policies to support opportunities for people with disabilities to advance in employment and achieve economic self-sufficiency (State Vocational Rehabilitation Services Program, 81 C.F.R., 2016). Consequently, employed people with disabilities may apply for and receive vocational rehabilitation services to assist with job retention or job advancement. However, there is a lack of information about the characteristics and outcomes of these employed applicants and, specifically, employed vocational rehabilitation applicants with visual disabilities. Information about this population would be helpful to vocational rehabilitation counselors and administrators as they pursue strategies to support visually impaired people (those who are blind or have low vision) in their ongoing employment efforts. Such information is critically important, given that visually impaired vocational rehabilitation consumers are more likely to be closed without a competitive employment outcome (O’Neill, Kaczetow, Pfaller, & Verkuilen, 2017; Warren-Peace, 2009).

Although people with visual impairments are more likely to enter vocational rehabilitation with employment than consumers with other disabilities (McDonnall, 2017), there is limited research concerning their job retention or career advancement. In a study of vocational rehabilitation outcomes, 75% of consumers with visual impairments aged 65 years or older who exited the vocational rehabilitation system as employed were already employed at application and utilized vocational rehabilitation primarily for assessment, diagnosis and treatment, counseling, and rehabilitation technology services (Dutta, Gervy, Chan, Chou, & Ditchman, 2008). In an older study (Herndon, 1995) that used vocational rehabilitation data from 1978 to 1980 and 1985 to 1986, employed applicants aged 35 years and younger were found to be more likely to change jobs than to retain employment in the same job; applicants who retained the same jobs were more likely to be college educated, to have less severe visual disabilities, and to receive physical restoration services and optical devices. Those who did not retain employment had more severe nonvisual disabilities, received orientation and mobility training, and had the highest use of nonoptical devices (Herndon, 1995).

Rehabilitation providers reported that strategies to facilitate job retention included communication among rehabilitation providers, consumers, and employers; consumer and work environment assessments; use of consults; timely service delivery; oversight of the rehabilitation process; and creativity in devising strategies (Sikka & Stephens, 1997). Although technology tends to facilitate job retention, consumers reported stress due to delays in obtaining

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and learning to use assistive technology, loss of productivity accessing printed materials, communication with the employer surrounding productivity, and transportation concerns (Crudden & Fireison, 1997). Vocational rehabilitation consumers with vision loss reported that transportation, navigating the workplace, using office equipment, the pace of work, stress, accessing print, and identifying signs and labels were barriers to job retention and career advancement, and that technology was the primary workplace accommodation (Rumrill, Schuyler, & Longden, 1997).

In general, persons with disabilities tend to seek vocational rehabilitation services after losing employment rather than for job retention (Allaire, Niu, & La-Valley, 2005). Early intervention, consumer empowerment, a proactive approach to problem solving, consumer follow-up, and involved employers were associated with job retention among persons with chronic illnesses (Koch, Rumrill, Conyers, & Wohlford, 2013). Employed vocational rehabilitation applicants with diabetes were more likely to receive assessment, diagnosis and treatment, counseling and guidance, rehabilitation technology, and on-the-job supports than were unemployed applicants with diabetes, who were more likely to receive occupational and vocational training, job readiness and placement, and other services (Chiu et al., 2015). Vocational counseling and guidance, education, and self-efficacy appear to support job retention among persons with rheumatic diseases (Allaire et al., 2005). There are similarities for persons with vision loss and those with other disabilities in retention and advancement barriers and the strategies to overcome

them, but the degree to which we can apply information about persons with other disabilities to persons with vision loss is unclear.

Although research about job retention is limited, multiple studies have examined factors associated with the employment of persons with visual impairments. However, these studies yield some conflicting conclusions. For example, some investigations determined that females were less likely to be employed (Darensbourg, 2013; Giesen et al., 1985), and others found that gender had no effect (Bell & Mino, 2013; Capella-McDonnall, 2005). Having a secondary disability in addition to vision loss has been found to negatively influence employment outcomes by some (Giesen & Cavenagh, 2012; Giesen et al., 1985; Kirchner & Peterson, 1982; Kirchner, Schmeidler, & Todorov, 1999; Warren-Peace, 2009) but not by Capella-McDonnall (2005). Older age was associated with employment in some studies (Hill, 1989; Kirchner & Peterson, 1982; and Kirchner et al., 1999), but a more recent study (Darensbourg, 2013) found younger persons more likely to be employed.

Given the lack of current knowledge about people with visual impairments seeking services for job retention and career advancement services, and the renewed focus on them generated by the WIOA, further exploration of the characteristics and outcomes of employed vocational rehabilitation applicants is warranted. Specifically, we examined the following research questions: How do the characteristics of employed vocational rehabilitation applicants who exit vocational rehabilitation with a job compare to the characteristics of

employed vocational rehabilitation applicants who lose employment? and What predicts loss of employment during vocational rehabilitation services for employed applicants?

Methods

SAMPLE

The national annual Rehabilitation Services Administration (RSA) Case Service Report (RSA-911) records consumer information regarding demographics, disability, services received, and outcomes. This study utilized the fiscal year 2015 RSA-911 data to identify vocational rehabilitation applicants aged between 18 and 75 years who had a primary disability of visual impairment and were competitively employed at application. We defined *competitively employed* as referring to individuals in one of the following employment categories at application: employed with or without supports in an integrated setting (employer job), self-employment, or business enterprise program, and compensated at or above the federal minimum wage. The sample was further restricted to those who received at least one vocational rehabilitation service. Consumers from U.S. territories and those ineligible due to death or being in an institution, prison, or jail were excluded. The final sample consisted of 4,499 cases that had no missing data on all variables of interest. This sample, who received vocational rehabilitation services and met all inclusion criteria, represented 32.4% of the entire population of blind and visually impaired individuals in fiscal year 2015.

The sample of 2,258 men (50.2%) and 2,241 women (49.8%) had an average age

of 48.7 years ($SD = 12.6$). The majority were White (73.8%), followed by 21.9% African American, 2.1% Asian, 1.1% multiple races, 0.8% Native American, and 0.4% Hawaiian or Pacific Islanders. In terms of ethnicity, 7.1% were Hispanics or Latinos of any race. At vocational rehabilitation closure, 8.2% had less than a high school education, 47.9% had high school or some post-secondary education, 14.2% held associate degrees or vocational or technical certificates, and 29.7% held bachelor's degrees or above. More than a third of the sample (34.7%) had a secondary disability, and 42.9% were legally blind. In terms of disability benefit support, 18.4% received only Social Security Disability Insurance (SSDI), 6.5% received only Supplemental Security Income (SSI), and 1.1% received both SSI and SSDI at application.

VARIABLES

The dependent variable was competitive employment at case closure, which was defined as earning at or above the federal minimum wage in an employer job, self-employment, or business enterprise program position. Because we were interested in investigating what leads to losing employment, consumers who were not competitively employed were coded "1" and those who were competitively employed were coded "0."

Independent variables consisted of consumers' demographic, disability, socioeconomic, and vocational rehabilitation service-related characteristics. Demographic variables included age, gender (0 = male, 1 = female), minority race (0 = White, 1 = non-White), Hispanic (0 = no, 1 = yes), and education at closure (four levels: less than high school; associate's

degree or vocational or technical certificate; bachelor's degree or higher; and high school or some post-secondary education, which served as the reference category). Socioeconomic variables included type of job at application (three categories: self-employed, business enterprise program, and the reference category employer job), weekly number of work hours at application, and hourly wage at application. Disability-related variables included severity of vision loss (0 = visual impairment, 1 = legal blindness), presence of a secondary disability (0 = no, 1 = yes), receipt of SSDI at application (0 = no, 1 = yes), and receipt of SSI at application (0 = no, 1 = yes). Vocational rehabilitation service-related variables included services received, vocational rehabilitation closure within the past three years (three categories: with employment outcome, without employment outcome, and none as the reference category), and time in vocational rehabilitation between application and case closure (vocational rehabilitation case length included three categories: one to two years; more than two years; and the reference category, less than one year). The eighteen vocational rehabilitation services (0 = no, 1 = yes) received by at least 1% of the sample were included in the model: vocational rehabilitation counseling and guidance (utilization rate 68.4%); diagnosis and treatment of impairments (65.7%); assessment (59.6%); rehabilitation technology (59.4%); disability-related skills training (25.1%); transportation (23.0%); information and referral services (15.9%); maintenance (10.9%); job placement assistance (10.1%); on-the-job supports, short-term (8.6%); job search assistance (6.6%); technical assis-

tance services (6.1%); occupational or vocational training (4.6%); job readiness training (4.0%); college or university training (junior or community, four-year, and graduate, 4.4%); benefits counseling (2.7%); on-the-job supports-supported employment (2.2%); and on-the-job training (1.2%).

DATA ANALYSIS

SAS Version 9.4 software was used for statistical analyses to address the research questions. Descriptive statistics were used to examine the characteristics of competitively employed vocational rehabilitation applicants who lost employment versus those who retained employment at case closure. Logistic regression analysis was performed to evaluate predictors of losing employment for the vocational rehabilitation group who were competitively employed at application.

Results

DESCRIPTIVE STATISTICS

All persons in the sample were competitively employed at the time of vocational rehabilitation application. At closure, most individuals (84.2%, $n = 3,787$) retained competitive employment, but 15.8% ($n = 712$) lost employment. Table 1 presents characteristics of the overall sample and each subsample based on employment outcome. On average, competitive employment retainers had weekly earnings of \$558.54 ($SD = \483.24), worked 33.0 hours ($SD = 10.5$) per week, and earned an hourly wage of \$16.54 ($SD = \12.42) at closure. Of those who lost competitive employment, 84.0% ($n = 598$) exited without an employment outcome, 13.9% ($n = 99$) exited as homemakers, and 2.1% ($n = 15$) had an

Table 1
Descriptive statistics for demographic, social-economic, disability, and service-related predictors.

Variable	Frequency (%) or <i>M</i> (<i>SD</i>)		
	All (<i>N</i> = 4,499)	Retained employment (<i>n</i> = 3,787)	Lost employment (<i>n</i> = 712)
Age (<i>M</i>)	48.7 (12.6)	49.0 (12.5)	47.4 (13.1)
Female	2,241 (49.8)	1,849 (48.8)	392 (55.1)
White	3,319 (73.8)	2,806 (74.1)	513 (72.5)
Hispanic	318 (7.1)	274 (7.2)	44 (6.2)
Education at closure			
Less than high school	367 (8.2)	302 (8.0)	65 (9.1)
High school or some post-secondary	2,156 (47.9)	1,790 (47.3)	366 (51.4)
AA or certificate/license	639 (14.2)	527 (13.9)	112 (15.7)
Bachelor's degree or above	1,337 (29.7)	1,168 (30.8)	169 (23.7)
Legal blindness	1,931 (42.9)	1,625 (42.9)	306 (43.0)
Secondary disability	1,563 (34.7)	1,256 (33.2)	307 (43.1)
SSDI receipt at application	879 (19.5)	747 (19.7)	132 (18.5)
SSI receipt at application	341 (7.6)	266 (7.0)	75 (10.5)
Type of job at application			
Employer	4,158 (92.4)	3,493 (92.2)	665 (93.4)
Self-employed	276 (6.1)	231 (6.1)	45 (6.3)
Business enterprise program	65 (1.4)	63 (1.7)	2 (0.3)
Weekly work hours at application (<i>M</i>)	31.4 (11.5)	31.9 (11.3)	29.2 (12.2)
Hourly wage at application (<i>M</i>)	15.42 (11.59)	15.65 (11.57)	14.22 (11.64)
Previous closure			
None	3,633 (80.8)	3,028 (80.0)	605 (85.0)
With employment outcome	814 (18.1)	723 (19.1)	91 (12.8)
Without employment outcome	52 (1.2)	36 (1.0)	16 (2.2)
Case length			
< 1 year	1,710 (38.0)	1,613 (42.6)	97 (13.6)
1 to 2 years	1,560 (34.7)	1,344 (35.5)	216 (30.3)
> 2 years	1,229 (27.3)	830 (21.9)	399 (56.0)

Note: All individuals were competitively employed at vocational rehabilitation application. Retained or lost employment refers to status at vocational rehabilitation closure.

employment outcome but were compensated below the federal minimum wage. Reasons for case closure of those without an employment outcome ($n = 598$) were: no longer interested in receiving services (43.8%, $n = 262$), unable to locate or contact (30.4%, $n = 182$), other reasons (21.2%, $n = 127$), disability too significant to benefit from vocational rehabilitation (2.5%, $n = 15$), and transferred to another agency (1.7%, $n = 10$).

The average amount of time between vocational rehabilitation application and case closure was 21.0 months ($SD = 20.0$, median = 14.0), with an average duration of 18.3 months for the retained employment group ($SD = 16.8$, median = 13.0) and 34.9 months for the lost employment group ($SD = 28.2$, median = 27.0). The overall average number of vocational rehabilitation services received was 4.1 ($SD = 2.1$), with an average of 4.0 services ($SD = 2.1$) for the

Table 2
Significant predictors, logistic regression analysis.

Variable	<i>b</i>	<i>SE</i>	<i>df</i>	Wald χ^2	OR (95% CI)
Female	0.26	0.09	1	8.04**	1.30 (1.08, 1.55)
Secondary disability	0.34	0.09	1	13.55**	1.40 (1.17, 1.68)
Education at closure (ref = high school or some post-secondary)			3	18.62**	
Less than high school	0.16	0.17	1	0.99	1.18 (0.85, 1.63)
AA or certificate/license	-0.11	0.13	1	0.75	0.89 (0.69, 1.15)
Bachelor or above	-0.47	0.12	1	16.20**	0.62 (0.49, 0.78)
Type of job at application (ref = employer job)			2	6.02*	
Self-employment	-0.12	0.19	1	0.39	0.89 (0.61, 1.29)
Business enterprise program	-1.77	0.74	1	5.69*	0.17 (0.04, 0.73)
Weekly work hours at application	-0.01	0.00	1	7.29**	0.99 (0.98, 1.00)
Previous closure (ref = none)			2	20.33**	
With employment outcome	-0.48	0.13	1	12.95**	0.62 (0.47, 0.80)
Without employment outcome	0.78	0.33	1	5.63*	2.19 (1.15, 4.19)
Age × case length (ref < 1 year)			2	10.95**	
Age × case length 1 to 2 years	0.02	0.01	1	2.31	^a
Age × case length > 2 years	0.03	0.01	1	10.10**	^a
On-the-job supports (short-term)	-1.12	0.21	1	28.44**	0.33 (0.22, 0.49)
Rehabilitation technology	-0.31	0.11	1	8.33**	0.74 (0.60, 0.91)
Diagnosis and treatment	-0.47	0.10	1	21.27**	0.63 (0.52, 0.77)

Note: * $p < .05$; ** $p < .01$; *SE* = standard error; OR = odds ratio; *df* = degrees of freedom; CI = confidence interval.

^a Follow-up results of age × case length are in Table 3.

retained employment group and 4.4 services ($SD = 2.4$) for the losing employment group. Four services received by more than half of those in each group included counseling and guidance, diagnosis and treatment of impairments, rehabilitation technology, and assessment.

LOGISTIC REGRESSION ANALYSIS

The logistic regression model was statistically significant, Wald χ^2 (39, $N = 4,499$) = 460.84, $p < 0.01$. The Hosmer and Lemeshow goodness-of-fit test was not significant, χ^2 (8, $N = 4,499$) = 12.19, $p = .14$, indicating that predicted and observed event rates were well calibrated. This model explained 20.4% (Nagelkerke R^2) of the total variance in competitive employment outcomes. The

sample is relatively large ($N = 4,499$), which provided sufficient power in finding small effects to be statistically significant.

Table 2 presents the significant main effects and interaction terms in the logistic regression along with the estimated coefficients, standard errors, degrees of freedom, Wald χ^2 statistics, odds ratios (OR), and associated 95% confidence intervals. If a significant independent variable ($p < .05$) had a positive estimate and $OR > 1$, the variable had a significant positive association with losing employment. If a significant variable had a negative estimate and $OR < 1$, the variable had a significant negative association with losing employment (in other words, a significant positive association with retaining employment).

Table 3
Odds ratios for losing employment based on case length by age.

Age	OR (95% CI)		
	> 2 years vs. < 1 year	> 2 years vs. 1 to 2 years	1 to 2 years vs. < 1 year
20	3.56 (1.97, 6.44)	2.09 (1.29, 3.39)	1.71 (0.91, 3.22)
30	4.85 (3.16, 7.44)	2.43 (1.71, 3.45)	2.00 (1.27, 3.15)
40	6.61 (4.91, 8.89)	2.83 (2.23, 3.60)	2.33 (1.71, 3.18)
50	9.00 (6.97, 11.64)	3.30 (2.69, 4.04)	2.73 (2.11, 3.53)
60	12.27 (8.72, 17.25)	3.84 (2.93, 5.03)	3.19 (2.27, 4.50)

Note: OR = odds ratio; CI = confidence interval.

Being female, presence of a secondary disability, and previously being closed by vocational rehabilitation without an employment outcome were associated with losing employment. Having a bachelor's degree (or higher), being in a business enterprise program position, and being previously closed by vocational rehabilitation with an employment outcome were associated with retaining employment. The more hours consumers worked at application, the less likely they were to lose employment. For each 10-hour increase in weekly working hours at application, the odds of losing competitive employment decreased by 10.3%. The odds of losing competitive employment were significantly reduced for those who received the following services: on-the-job supports, short-term; diagnosis and treatment of impairments; and rehabilitation technology.

The significant interaction between age and duration in vocational rehabilitation indicates that the relationship between competitive employment and vocational rehabilitation case length differs by age. With increasing age, the odds of losing employment for consumers who stayed in vocational rehabilitation for an additional year significantly increased (see Table 3). For example, at the age of 20 years, the odds of losing employment for those stay-

ing in vocational rehabilitation for more than two years were 3.56 times higher than the odds for those staying in vocational rehabilitation less than one year; at the age of 60 years, these odds increased to 12.27 times. The results indicate that, at a given age, the longer a consumer stayed in vocational rehabilitation, the more likely the consumer would be to exit without competitive employment (see Figure 1).

Discussion

Almost one-third (32.4%) of visually impaired vocational rehabilitation applicants who received services and were closed in fiscal year 2015 were competitively employed at the time of application. The study presented here investigated employed applicants with visual disabilities and compared those who exited the vocational rehabilitation system with employment with those who exited it without employment. Employed applicants who retained employment at closure had different characteristics than employed applicants who did not retain employment. Regardless of employment outcome, employed applicants tended to receive assessment, counseling and guidance, diagnosis and treatment, and rehabilitation technology. Interestingly, these are four

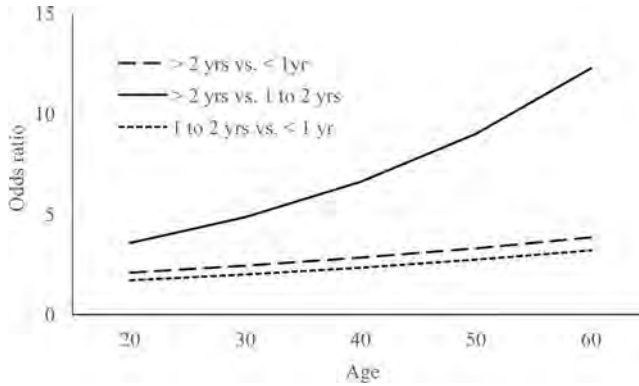


Figure 1. Odds ratios of losing employment by age in vocational rehabilitation case length comparisons.

of the five services that employed vocational rehabilitation applicants with diabetes were most likely to receive (Chiu et al., 2015).

It is a positive sign that many individuals who are visually impaired enter vocational rehabilitation services with employment, since it is often easier to retain a job than to find a job. However, we do not have information about why these employed applicants were interested in those services. They may have wanted assistance with retaining or advancing in their current jobs; alternatively, they may have wanted to find another job despite being employed at application. Some consumers may have been in temporary jobs, were working part-time while attending high school or post-secondary school, or were underemployed and seeking to obtain a job more consistent with their skills and education. Employed applicants may have had vision loss that required job accommodations or sustained visual problems that were ameliorated or eliminated by diagnostic and treatment services. It would be valuable to have information about the employment motivations of those applying for vocational rehabilitation services while em-

ployed, which could be another variable included in the RSA-911 database.

It is also encouraging to note that the majority (over 84%) of employed applicants retained employment. Of the 712 who exited without employment, 16% were in an employment closure status but in situations categorized as not competitive (such as homemakers or those earning below minimum wage). The most frequently cited reason for closure without an employment outcome was that the consumer was no longer interested in receiving services. Information about age at onset of vision loss, if available, might provide clues regarding why these applicants lost interest in rehabilitation. Potentially, some were new to vision loss and thus were overwhelmed with the adjustment to this disability. Worsening vision may also be a reason for loss of interest in pursuing employment. Almost one-third of the cases where job retention was not successful were closed because of difficulty locating or contacting the individual. The WIOA requires that employment, educational, and other workforce systems collaborate and share data. As agencies refine these data-sharing agreements, counselors

may be able to reduce the numbers of cases closed due to loss of contact.

Employed vocational rehabilitation applicants who lost employment were more likely to be female, have secondary disabilities, work fewer hours at application, and have a previous unsuccessful vocational rehabilitation closure. Approximately 43% of persons who lost employment had secondary disabilities. Poor health was very closely associated with a lower likelihood of employment for people with visual impairments in a previous study (Kirchner et al., 1999), and consumers with secondary disabilities may have more complex health- or disability-related concerns that make job retention more difficult. More than half (52.3%) of those who did not retain employment were working part-time (less than 35 hours per week) at application, and 12.1% were working less than 10 hours per week. Those who lost employment were more likely to be part-time workers than those who retained employment. In the U. S. labor market, part-time workers are more likely to hold low-paying jobs or lose their jobs, and are less likely to receive benefits or be promoted (Gillespie, 2016; Morrison & Robbins, 2015). Persons working fewer hours at application may have made lifestyle adjustments to accommodate reduced income and, consequently, might have been less financially invested in maintaining employment. Their employment may have been less stable, such as seasonal or temporary work, or they may have been less committed to the workforce because of the negative aspects of part-time work.

Almost one-fifth (19.1%) of employed applicants had a previous vocational rehabilitation closure. Only a small portion

of those who lost employment (2.2%, $n = 16$) had a previous closure without an employment outcome. Additional research is needed to determine how best to support consumers who enter the vocational rehabilitation system employed after a previous unsuccessful closure.

Consumers who had a previous successful closure and retained employment ($n = 723$) were most likely to receive rehabilitation technology (73.3%, $n = 530$), counseling and guidance (67.9%, $n = 491$), and assessment (54.1%, $n = 359$). Consumers who retained employment were more likely to have at least an undergraduate degree, be business enterprise program vendors, and have a previous vocational rehabilitation closure with an employment outcome. Applicants with at least an undergraduate degree may have more skilled employment with job tasks that are easily accommodated. Business enterprise program vendors are a unique population because their jobs are designed to accommodate their vision loss, and business enterprise programs are closely linked to the vocational rehabilitation system. Consumers with a previous successful closure may have been seeking relatively simple follow-up services such as updated assistive technology or assistance with other changes in the business environment. Employers have expressed the importance of having the vocational rehabilitation agency available for assistance with their employees' assistive technology (McDonnall & Crudden, 2015).

Vocational rehabilitation case length was an important predictor of losing employment in our model. Those who retained employment received vocational rehabilitation services for a much shorter period of time on average (18.3 months)

than those who did not retain employment (34.9 months). Having one's case open for a longer time was associated with a greater likelihood of losing employment for everyone, and the interaction between age and case length indicates that for older visually impaired persons longer time in vocational rehabilitation puts them at an even greater risk of losing their jobs. However, spending more time in vocational rehabilitation may mean that these consumers had multiple and more complex rehabilitation needs. For older workers, vision loss may have occurred later in life, meaning they may not be adjusted to their visual disability or may lack experience with workplace accommodations. When substantial time to address these needs is necessary, it may be more difficult for those workers to retain employment. Additionally, persons working full-time may find it difficult to get time away from their jobs to participate in extended rehabilitation programs.

When an employed applicant comes to vocational rehabilitation with the goal of retaining employment, providing services quickly is important. The interaction between case length and age may be associated with many younger consumers needing extended services, such as while in high school and college, so longer case length is not as much of a detriment to this age group. Also, younger consumers who are in school are unlikely to retain their current jobs. Consumers who are older and unable to receive short-term interventions to save their current jobs quickly may opt to retire or pursue SSDI rather than look for another job. An important implication of these findings is that vocational rehabilitation agencies should make job retention cases a high

priority and should provide expedited services to consumers in jeopardy of losing their jobs. Agencies serving those with visual disabilities rarely have formal policies expediting services to those in danger of losing their jobs, but some have informal policies that those whose jobs are "in jeopardy" receive expedited services (Crudden, 2017).

Visually impaired individuals who received diagnosis and treatment, short-term on-the-job supports, and rehabilitation technology services had higher odds of retaining employment. The diagnosis and treatment category includes a range of potential services such as corrective surgery or treatment, prosthetics or orthotics, and eyeglasses and visual training (Rehabilitation Services Administration [RSA], 2013). These diagnostic and treatment services may assist in regaining, stabilizing, or maximizing use of vision, thus facilitating the ability to retain employment. Short-term on-the-job supports are services to promote job retention and may include job coaching (RSA, 2013). Persons with vision loss may use time-limited job coaches to learn new tasks or how to accomplish tasks with new assistive technology. Other services that could be included in this category are educational or consultation services directed toward employers and coworkers to familiarize them with vision loss and effective job accommodations. Those receiving this service were likely trying to retain their existing jobs, and receipt of this service was strongly associated with retaining employment (with odds three times higher). Rehabilitation technology includes receipt of technology and can include related services, such as an evaluation of the visually impaired person's

technology needs, identifying and potentially customizing selected technology, coordinating technology with the employer's technology, and training about how to use technology (RSA, 2013). Previous research found that technology is an important accommodation for these persons as they seek to overcome barriers to employment (Crudden, 2002; Rumrill et al., 1997), and these findings support this earlier research.

LIMITATIONS

This study is an ex post facto analysis of data collected by vocational rehabilitation state agencies as part of the effort by the federal government to document types of disabilities consumers have, services provided and their costs, and employment outcomes. Conclusions regarding these results are limited because there are likely factors, such as age of onset of vision loss, that are not available in this dataset but that could influence this model. The data also does not allow us to discriminate between persons who sought vocational rehabilitation services for job retention or career advancement, or to obtain a new job.

CONCLUSIONS

With almost one-third of visually impaired persons entering vocational rehabilitation with employment, it is important to learn more about this population and what predicts successful or unsuccessful closures. Most employed applicants retain employment at closure. A large percentage of employed applicants who exit the vocational rehabilitation system as unemployed do so because they decided not to continue receiving services or because staff members were unable to locate them. Increased efforts to maintain

both motivation and contact with consumers appear warranted, given the emphasis in the WIOA on job retention and career advancement. Although federal record-keeping procedures have not required it, state agencies could follow up with visually impaired individuals to learn why they are losing interest and, where possible, renew interest in vocational rehabilitation and employment. Efforts to maintain contact with them may be strengthened by data-sharing agreements mentioned in the WIOA.

Employed applicants who exit the vocational rehabilitation system without employment are more likely to be female; to have secondary disabilities, a previous vocational rehabilitation closure without employment, and less education; and to work fewer hours at application than do employed applicants who retained employment. Longer vocational rehabilitation case length was also associated with losing employment, and with a larger effect exhibited for older consumers. Although the counselors must devise individual plans of employment specific to the distinct needs of each individual, they should keep in mind the importance of providing services quickly to those who are trying to retain an existing job. Awareness of the characteristics that put employed applicants at risk for closure as unemployed may also be helpful to counselors in anticipating barriers to job retention and making plans to address those barriers.

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