



# Demographic Covariates, Vocational Rehabilitation Services, and Employment Outcomes of Working-Age Adults with Anxiety Disorders: A Multivariate Logistic Regression Analysis

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## Abstract

**Purpose** This study aimed to investigate the relationships between demographic covariates, vocational rehabilitation (VR) services, and employment outcomes of individuals with anxiety disorders. The specific research question for the current study investigate demographic variables and vocational rehabilitation services as predictors of competitive employment outcomes.

**Methods** Data for the present study were extracted from the most recent United States Rehabilitation Service Administration 2018 Case Service Report (RSA-911) data. A purposeful selection, multivariate logistic regression analysis was conducted to examine the case service report data of 9266 individuals with anxiety disorders who received vocational rehabilitation services based on their demographic variables and receipt of VR services.

**Results** The results indicated that African Americans and Latinx, people who have completed high school or more, people who do not receive disability-related benefits, and those who received more vocational rehabilitation services were more likely to be gainfully employed. In addition, receipt of financial support for life crises and occupational credentials (i.e., other services and maintenance services) and vocational rehabilitation counseling and guidance services were significant predictors of employment outcomes. Conversely, receipt of supported employment and transition services were negatively associated with employment outcome.

**Conclusions** In the present study, we identified VR services that can improve and risk factors that can impede employment outcomes of people with anxiety disorders. We also identified medical, psychosocial, and vocational interventions that can lessen the effect of anxiety disorders on physical and mental health functioning.

**Keywords** Vocational rehabilitation · Anxiety disorders · Rehabilitation Service Administration · Other services · Maintenance services

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According to the National Institute of Mental Health, an estimated 19.1% of U.S. adults had an anxiety disorder at any specific point in time, and an estimated 31.1% of U.S. adults experience an anxiety disorder at some time in their lives [1]. There is a range of anxiety disorders that differ by the objects or situations that induce them, but most of them share features of excessive anxiety and related behavioral disturbances that can interfere with everyday life and functioning, including schoolwork, interpersonal relationships, job performance, and physical and mental health [2, 3]. Anxiety disorders include panic disorder, generalized anxiety disorder, agoraphobia, specific phobia, social anxiety disorder (social phobia), posttraumatic stress disorder,

obsessive-compulsive disorder, and separation anxiety disorder [4].

The International Classification of Diseases Tenth Revision (ICD-10; Centers for Disease Control and Prevention [CDC]) describes common symptoms of anxiety disorders that include (a) apprehension (e.g., worries about future misfortunes, difficulty concentrating, etc.), (b) motor tension (e.g., tension, headaches, trembling, restlessness, fidgeting, inability to relax), and (c) autonomic overactivity (e.g., sweating, dizziness, dry mouth, lightheadedness, tachycardia or tachypnoea, and epigastric discomfort) [5]. Research has indicated that anxiety is increasing in the United States among adults younger than 50 years of age, with a more rapid increase among young adults [6]. Anxiety disorders are one of the costliest mental health disorders and pose a significant economic burden on the U.S. healthcare system and the U.S. economy. DeVane and colleagues (2005) reported that anxiety disorders place a significant economic impact on the U.S. healthcare system [7]. The total annual cost of anxiety disorders has been estimated to be between \$42.3 billion and \$46.6 billion, of which more than 75% can be attributed to morbidity, mortality, lost productivity, and other indirect costs. The annual total cost for outpatient adults with anxiety disorders was estimated to be \$48.72 billion in 2013, which accounted for 24.2% of the total \$201 billion mental health disorder expenditures in 2013 [8, 9]. In addition, the cost incurred from decreased work productivity (e.g., absenteeism and presenteeism) was 70% of the total anxiety disorders outpatient annual cost [9].

Results from the Anxiety and Depression Association of America (ADAA) Stress and Anxiety Survey indicated that anxiety disorders significantly affected workplace performance, relationship with coworkers and peers, quality of work, and relationships with superiors [2]. Similarly, Waghorn and colleagues (2005) conducted a secondary analysis study with a sample of 42,664 individuals using the Australian Bureau of Statistics (ABS) National Survey data. The results indicated that anxiety disorders were associated with reduced labor force participation, degraded employment trajectories, and impaired work performance compared to people without chronic health conditions and disabilities [3]. Relatedly, research also indicated that coronavirus disease 2019 (COVID-19)-induced job uncertainty is associated with greater depressive and anxiety symptoms [10, 11].

Paradoxically, research has indicated that employment is an effective public health intervention for working-age adults with physical and mental impairments. Gainful employment has significant financial, psychological, social, and health benefits that can improve the health and well-being of people with and without disabilities [12, 13]. Kamerāde et al. [13] used the United Kingdom Household Longitudinal Study (2009–2018) data from individuals

aged between 16 and 64 to analyze the benefits of gainful employment. They reported that working even just one day per week is sufficient to gain health and well-being benefits of employment [13]. Hall et al. [14] examined the United States Medicare and Medicaid claim data for working-age adults with disabilities and found significantly lower rates of smoking, reduced medical costs, and higher levels of self-reported health status and quality of life among adults with chronic health conditions and disabilities who were employed in comparison to unemployed individuals with disabilities. Conversely, research has indicated that unemployed persons are more susceptible to physical and mental health concerns, such as depression, alcohol and drug use, domestic violence, obesity, diabetes, and high blood pressure [15–18]. Therefore, assisting working-age adults with anxiety disorders to find and retain meaningful employment may significantly improve their physical and mental health, quality of life, and reduce healthcare expenditures associated with anxiety disorders.

## Rationale and Purpose of the Study

In the United States, the state-federal vocational rehabilitation (VR) program, which serves approximately one million persons with disabilities each year and spends more than \$3.6 billion annually, has a long history of successfully helping people with disabilities achieve their independent living and employment goals [19–21]. The employment rate of people with disabilities after VR services is reported to be approximately 55% [22], demonstrating the effectiveness of VR services on improving employment outcomes of people with chronic health conditions and disabilities. Specifically, rapid job search, on-the-job support, workplace adjustments, and psychological support are reported to be effective VR interventions [36, 39]. However, with advancement of technology and impact of COVID-19 pandemic, recent studies have emphasized virtual reality interventions such as virtual reality job interview training should be integrated into vocational rehabilitation as a supportive therapy for people with anxiety disorders [38, 40]. Additionally, demand-side interventions, including building a partnership with local and federal employers, offering extensive advice, consultation and training, and using technological tools, are found to improve employment outcomes for people with mental health problems [37].

People with anxiety disorders who have never worked, are at risk of losing their jobs, and/or want to return to work can benefit from state VR services. Although there are empirical studies exploring the impact of VR services on employment outcomes of many disability groups, there is a dearth of research investigating demographic characteristics

and types of VR services associated with employment of working-age adults with anxiety disorders. Research in this topical area can better inform our understanding of what VR services are most beneficial in improving employment outcomes of persons with anxiety disorders. The purpose of this study was to investigate the relationship between demographic covariates, VR services, and employment outcomes for working-age adults with anxiety disorders. The specific research questions that guided this study were as follows:

1. What demographic variables are associated with employment outcomes of persons with anxiety disorders?
2. What vocational rehabilitation services are associated with employment outcomes of persons with anxiety disorders after controlling for the effect of demographic covariates?

## Method

### Data Source

Data for this study were extracted from the United States Department of Education Rehabilitation Services Administration Case Service Report (RSA-911) database, which contains detailed information about demographics, disability, types of services, and

employment outcomes for all individuals with disabilities receiving state vocational rehabilitation services in the United States. The RSA-911 data set for program year 2018 was used for the present analyses, as it is the most recent RSA-911 database that is available for public and research purposes. In the RSA-911 code book, a successful employment outcome is defined as working either full or part time in a competitive integrated employment setting, in a state-managed Business Enterprise Program (BEP), or in self-employed status for which the individual is paid at or above the minimum wage. Minimum wage is defined as the state or Federal minimum wage, whichever is higher.

### Participants

The participants of this study included 9,266 prime working-age (25 to 54 years old) adults with anxiety disorders. The mean age of the participants was 38.39 years old ( $SD=8.65$ ). Most of the participants were white (64.5%), women (56.8%), with a high school degree or higher (73.9%), and not social security disability beneficiaries (76.8%). The demographic characteristics of the sample is shown in Table 1.

**Table 1** Participants' demographic characteristics and services provided

Characteristic/service	n	%
Age		
25–35	3889	42.0
36–44	2633	28.4
45–55	2774	29.6
Gender		
Male	3992	43.1
Female	5264	56.8
Race		
White	5978	64.5
Black or African-American	1637	17.7
American Indian or Alaska Native	241	2.6
Asian, Native Hawaiian or Other Pacific Islander	194	2.1
Hispanic or Latino	1038	11.2
Education Level		
No formal education	1330	14.4
High school degree or lower	3752	40.5
Postsecondary education/Associate degree	2063	22.3
Bachelor degree or higher	1032	11.1
SSI/SSDI recipient		
Yes	2151	23.2
No	7115	76.8
Services provided		
Assessment	2555	27.6
Diagnostics and treatment	726	7.8
Counseling and guidance	7989	86.2
Occupational or vocational training	130	1.4
Job readiness training	526	5.7
Miscellaneous training	95	1.0
Job search assistance	1466	15.8
Job placement assistance	1455	15.7
Transportation services	390	4.2
Maintenance	350	3.8
Supported employment	194	2.1
Information and referral	1469	15.9
Benefits counseling	407	4.4
Other services	460	5.0

## Variables

### Independent Variables

The current study included two sets of independent variables: demographic variables and VR services provided to prime working-age adults with anxiety disorders. The demographic variables were age, gender, race, education, and receipt of Supplemental Security Income (SSI) and/or Social Security Disability Insurance (SSDI). VR services included college or university training, community college training, occupation or vocational training, on-the-job training, registered apprenticeship training, basic academic remedial or literacy training, job readiness training, disability-related skills training, miscellaneous training,

**Table 2** Description of Vocational Rehabilitation Services

Types of VR Services	Descriptions of VR Services
1. <i>Assessment</i>	Services provided and activities performed to determine an individual's eligibility for vocational rehabilitation services, to assign an individual to a priority category of a state vocational rehabilitation agency that operates under an order of selection, and/or to determine the nature and scope of vocational rehabilitation services to be included in the individualized plan for employment (IPE); included in this category are trial work experiences and extended evaluation.
2. <i>Diagnosis and Treatment of Impairments</i>	Surgery, prosthetics and orthotics, nursing services, dentistry, occupational therapy, physical therapy, speech therapy, and drugs and supplies; this category includes diagnosis and treatment of mental and emotional disorders.
3. <i>Vocational Rehabilitation Counseling and Guidance</i>	Discrete therapeutic counseling and guidance services necessary for an individual to achieve an employment outcome, including personal adjustment counseling; counseling that addresses medical, family, or social issues; vocational counseling; and any other form of counseling and guidance necessary for an individual with a disability to achieve an employment outcome; this service is distinct from the general counseling and guidance relationship that exists between the counselor and the individual during the entire rehabilitation process.
4. <i>Occupational/Vocational Training</i>	Occupational, vocational, or job skill training provided by a community college and/or a business, vocational/trade, or technical school to prepare students for gainful employment in a recognized occupation; this training does not lead to an academic degree or certification.
5. <i>Job Readiness Training</i>	Training to prepare an individual for the world of work (e.g., appropriate work behaviors, methods for getting to work on time, appropriate dress and grooming, methods for increasing productivity).
6. <i>Miscellaneous Training</i>	Any training not recorded in one of the other categories listed, including GED or high school training leading to a diploma.
7. <i>Job Search Assistance</i>	Job search activities that support and assist a consumer in searching for an appropriate job; may include help in preparing resumes, identifying appropriate job opportunities, and developing interview skills, and may include making contacts with companies on behalf of the consumer.
8. <i>Job Placement Assistance</i>	A referral to a specific job resulting in an interview, whether or not the individual obtained the job.
9. <i>Supported Employment</i>	On-going support services and other appropriate services needed to support and maintain an individual with a most significant disability in supported employment for a period of time generally not to exceed 18 months; such services, such as job coaching, are for individuals who have supported employment and long-term supports identified on the individualized plan for employment (IPE).
10. <i>Transportation</i>	Travel and related expenses necessary to enable an applicant or eligible individual to participate in a vocational rehabilitation service; includes adequate training in the use of public transportation vehicles and systems.
11. <i>Maintenance</i>	Maintenance means monetary support provided for those expenses such as food, shelter and clothing that are in excess of the normal expenses of the individual, and that are necessitated by the individual's participation in an assessment for determining eligibility and vocational rehabilitation needs or while receiving services under an individualized plan for employment (IPE).
12. <i>Information and Referral Services</i>	Services provided to individuals who need assistance from other agencies (through cooperative agreements) not available through the vocational rehabilitation program.
13. <i>Benefits Counseling</i>	Assistance provided to an individual who is interested in becoming employed, but is uncertain impact work income will have on any disability benefits and entitlements being received, and/or is not aware of benefits, such as healthcare, available to support any work attempt.
14. <i>Other Services</i>	All other vocational rehabilitation services that cannot be recorded elsewhere; included here are occupational licenses, tools and equipment, and initial stocks and supplies.

Randolph-Sheppard entrepreneurial training, customized training, assessment, diagnostics and treatment, counseling and guidance, job search assistance, job placement assistance, short-term job support, supported employment, information and referral, benefits counseling, customized employment services, extended services, transportation services, maintenance services (financial support for life crisis), rehabilitation technology services, personal assistance services, technical assistance services, reader and interpreter services, and other services (receipt of financial assistance for occupational credential; see Table 2 for descriptions of VR services). The variables are categorized as follows:

1. Age (0 = 25–34, 1 = 35–44, 2 = 45–54).
2. Gender (0 = male and 1 = female).
3. Race (0 = White, 1 = African American, 2 = American Indian or Alaskan Native, 3 = Asian or Native Hawaiian, 4 = Hispanic or Latinx).
4. Education Level (0 = no formal education, 1 = a secondary school diploma or equivalency; or certificate of attendance completion, 2 = postsecondary education or associate degree, 3 = bachelor's degree or higher).
5. Receipt of SSI and/or SSDI benefits (0 = not receiving SSI and/or SSDI disability benefits, 1 = receiving SSI and/or SSDI benefits).
6. Vocational rehabilitation services (0 = not provided, 1 = provided).

### Outcome Variable

The outcome variable of this study is competitive integrated employment. It is defined as a type of work for which an individual is paid at least minimum wage, a payment not less than the customary rate paid for individuals without disabilities, or self-employment that yields an income that is similar to earnings of people without disabilities who are self-employed.

### Procedure and Data Analysis

The present study used a quantitative correlational design [23]; more specifically, multivariate logistic regression analysis was used to determine the relationships between demographic covariates, VR services, and employment outcomes. We received approval to conduct this study from the

institutional review board of the University of Wisconsin-Madison. Before conducting the analysis, multicollinearity among the variables was screened. The correlations between the variables were lower than 0.80, indicating that there was no multicollinearity among the variables. The analyses were conducted using SPSS (version 24). Hosmer et al. (2013) suggested using purposeful selection of variables in conducting logistic regression analysis [24]. The purposeful selection of variables aims to build the most parsimonious and best-fit model. This procedure includes (1) identifying independent variables that has significant one-on-one associations with the dependent variable at  $p < .20$ , (2) building an initial regression model with all variables with  $p < .20$  identified in Step 1, (3) removing variables that were not significant at the  $p < .05$  level and did not change the beta coefficients of the significant variables by more than 20%, (4) adding variables that were insignificant in Step 1 and retaining them if they become significant, (5) checking for interactions between the variables, and (6) examining the model's accuracy and its fit (Hosmer et al., 2013). By building the most parsimonious and best-fit model, the current study investigated the relationship between (a) demographic variables and (b) VR services and employment outcomes of persons with anxiety disorders.

### Results

The results of descriptive statistical analyses showed that 38.4% of the prime-working-age adults with anxiety disorders were employed after receiving VR services, appreciably lower than the expected outcome of 55% for all VR clients (U.S. Department of Education, 2016). The results also indicated that the most frequently provided VR services were counseling and guidance (86.2%), assessment (27.6%), and information and referral services (15.9%). VR services provided to less than 1% of the clients in the present study were excluded from the subsequent analysis. These services were college or university training, on-the-job training, registered apprenticeship training, basic academic remedial or remedial training, disability-related skills training, Randolph Sheppard Entrepreneurial training, customized training, customized employment services, extended services, rehabilitation technology, personal assistance services, technical assistance services, reader services

**Table 3** The Relationship Between Number of VR Services, Time Spent in VR, and Employment Outcomes for Working-Age Adults with Anxiety Disorders

	Competitively Employed		Unsuccessful Outcome		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Number of VR services	2.12	1.54	2.00	1.56	-3.65*
Time spent in VR	18.17	16.66	18.30	18.40	0.34

Note. \* $p < .01$

and interpreter services. The average length of time in the VR system was 18.25 months ( $SD=17.75$ ), and the average number of services received was 2.05 ( $SD=1.55$ ).

The results indicated that on average, the participants who achieved competitive integrated employment received a greater number of services ( $M=2.12$ ,  $SD=1.54$ ) than participants who had an unsuccessful outcome ( $M=2.00$ ,  $SD=1.56$ ;  $t_{(7631)} = -3.65$ ,  $p < .001$ ;  $d=0.07$ , equal variance not assumed). However, time spent in VR services did not significantly differ for participants who achieved competitive employment ( $M=18.17$ ,  $SD=16.66$ ) and those who did not achieve competitive employment ( $M=18.30$ ,  $SD=18.40$ ;  $t_{(8107)}=0.34$ ,  $p=.72$ ). The results are shown in Table 3.

### Predictors of Competitive Integrated Employment

Logistic regression with a purposeful selection of variables was used to investigate the relationships between demographic variables, VR services, and employment outcomes for prime-working-age adults with anxiety disorders.

### Building Logistic Regression with Purposeful Selection of Variables

As a first step, the relationships between predictor variables and the outcome variable were examined. The results indicated that age and basic academic literacy, miscellaneous

training, transportation, and/or maintenance were not significantly associated with employment. The rest of the predictors were significantly associated with competitive integrated employment at  $p < .20$ . In the second step, all the significant predictor variables identified in step 1 were included in a new regression model. The results showed that race/ethnicity, educational attainment, cash benefits, counseling and guidance, supported employment services, and other services were significantly associated with competitive integrated employment at the  $p < .05$  level. In the third step, the non-significant variables were removed from the model. Removal of the non-significant variables did not change beta coefficients by more than 20%. In the fourth step, the variables that were not significant in step 1 were returned to the model. Both transportation and maintenance services became significant in this model. The final model included the following significant predictor variables: race, education, cash benefits, counseling and guidance, supported employment, other services, transportation, and maintenance services. The results are shown in Table 4.

The results indicate that the omnibus test for the final model was significant ( $\chi^2(13, N=8036)=309.95$ ,  $p < .001$ ), indicating that there were significant relationships between the predictor variables and the outcome variable. The Nagelkerke  $R^2$  of .05 showed that predictors had a small effect on the outcome variable. However, the Hosmer and Lemeshow test, a measure of goodness of fit,  $\chi^2(7, N=8036)=5.00$ ,  $p=.66$ , *n.s.*, indicated that the model was

**Table 4** The Relationship Between Significant Predictor Variables and Competitive Employment for Working-Age Adults with Anxiety Disorders

Predictors	B	SE B	Sig	Odds Ratio	95% CI	
Race						
White			0.000			
African American	0.366	0.062	0.000	1.442	1.278	1.628
American Indian or Alaskan Native	-0.097	0.149	0.513	0.907	0.677	1.215
Asian or Native Hawaiian	0.177	0.151	0.242	1.194	0.887	1.606
Hispanic or Latinx	0.345	0.072	0.000	1.411	1.226	1.624
Education level						
No formal education			0.000			
A secondary school diploma or equivalency or certificate of attendance completion	0.224	0.068	0.001	1.251	1.096	1.429
Postsecondary education or associate degree	0.301	0.074	0.000	1.351	1.168	1.563
Bachelor's degree or higher	0.628	0.087	0.000	1.873	1.578	2.222
Cash Benefits	-0.545	0.055	0.000	0.580	0.520	0.647
VR Services						
Other services	0.397	0.111	0.000	1.487	1.197	1.847
Maintenance	0.353	0.148	0.017	1.423	1.065	1.900
Vocational rehabilitation counseling and guidance	0.163	0.081	0.043	1.178	1.005	1.380
Supported employment	-1.541	0.223	0.000	0.214	0.138	0.331
Transportation	-0.472	0.141	0.001	0.624	0.474	0.822

Note: Final Model=  $\chi^2(13, N=8036)=309.95$ ,  $p < .001$ . The Nagelkerke  $R^2=0.05$ . Hosmer and Lemeshow=  $\chi^2(7, N=8036)=5.00$ ,  $p=.66$ , *n.s.*.



a good fit to the data [25]. The model accurately classified 59.3% of the participants into competitively employed and unsuccessful outcome groups.

### The Relationships Between Demographic Variables and Employment Outcomes

In particular, African American ( $OR = 1.44$ , 95% CI 1.27–1.62) and Hispanic and Latinx ( $OR = 1.41$ , 95% CI 1.22–1.62) were more likely to obtain competitive integrative employment than whites. Clients with a high school education ( $OR = 1.25$ , 95% CI 1.09–1.43), associated degree ( $OR = 1.35$ , 95% CI 1.16–1.56), and a bachelor's degree or higher ( $OR = 1.87$ , 95% CI 1.57–2.22) were more likely to obtain competitive employment than clients with less than a high school education. Clients who received cash benefits (SSI/SSDI) were less likely to obtain competitive employment ( $OR = 0.58$ , 95% CI 0.52–0.64) than clients who did not receive disability-related cash benefits.

### Relationships Between Vocational Rehabilitation Services and Employment Outcomes

The results regarding specific VR services are provided below:

- The odds of obtaining competitive employment for clients receiving other services were 1.45 times ( $OR = 1.48$ ; 95% CI: 1.19–1.84) greater than the odds of those who did not receive other services.
- The odds of obtaining competitive employment for clients receiving maintenance services were 1.43 times ( $OR = 1.42$ ; 95% CI: 1.06–1.90) greater than the odds of those who did not receive maintenance services.
- The odds of obtaining competitive employment for clients receiving vocational rehabilitation counseling and guidance services were 1.17 times ( $OR = 1.17$ ; 95% CI: 1.00–1.38) greater than the odds of those who did not receive vocational rehabilitation counseling and guidance services.
- Clients who received supported employment services were less likely to obtain competitive employment ( $OR = 0.21$ , 95% CI 0.13–0.33) than clients who did not receive supported employment services.
- Clients who received transportation services were less likely to obtain competitive employment ( $OR = 0.62$ , 95% CI 0.47–0.82) than clients who did not receive transportation services.

## Discussion

The findings of the present study identified several facilitators and risk factors that significantly affected the employment outcomes of prime-working-age adults with anxiety disorders. Although the amount of variance explained is relatively low, the literature includes studies of VR services that explain a similar quantity of variances [26, 27]. Having a higher level of education and being African American or Hispanic were positively related to employment outcome, while receiving cash benefits was negatively associated with competitive employment. After controlling for the demographic variables, clients who received other services, maintenance services, and vocational rehabilitation counseling and guidance were more likely to obtain competitive employment, and clients who received supported employment and transportation services were less likely to obtain competitive employment. In addition, clients who received a higher number of services had better employment outcomes than clients who received a smaller number of services. Overall, the findings of the study were consistent with previous studies indicating positive relationships with other, maintenance, and vocational rehabilitation counseling services and competitive employment [26].

The results indicated that other services were significantly associated with competitive employment. Examples of other services include occupational licenses, tools and equipment, and initial stocks and supplies. Previous research also found that other services were significantly associated with competitive employment for people with mental health problems [28, 26]. One explanation may be that people with anxiety disorders are more likely to be unemployed and may need financial assistance to purchase equipment and tools or obtain a license required to perform skilled trade and professional jobs. Maintenance services were significantly associated with competitive employment. This finding is consistent with similar RSA-911 research indicating that maintenance services had a positive impact on the employment outcome of people with mental health problems [28, 26]. Specifically, clients with anxiety disorders from low-income backgrounds and those in a life crisis might need financial support for food, shelter, and clothing in order to participate in VR services to improve their employment outcome.

Clients who received vocational rehabilitation counseling and guidance services were more likely to obtain competitive employment than clients who did not receive those services. Counseling and psychotherapy, medications, and complementary health approaches are used to treat anxiety disorders [29]. The literature clearly shows the positive effect of counseling and psychotherapy on the psychological well-being of people with anxiety disorders [30].

Therefore, it is expected that psychological counseling can reduce the psychological problems associated with anxiety disorders, and career counseling can increase the motivation to find gainful employment that leads to better employment outcomes.

African American and Hispanic/Latinx clients were more likely to obtain competitive employment than whites in the current study. It is possible that the intersection of race/ethnicity and poverty might increase the necessity and motivation for African American or Hispanic Latinx clients to actively seek employment [26]. Finally, the research shows that clients who received a greater number of services were more likely to obtain competitive employment. The findings indicate that clients with anxiety disorder need more intensive vocational rehabilitation services.

The findings indicated that cash benefits, transportation services, and supported employment were negatively associated with competitive employment. Previous research indicated that VR clients who received cash benefits had lower employment outcomes than clients who did not receive cash benefits [28]. Research has indicated that SSI and SSDI recipients can benefit from work incentives benefits counseling [31–33]. Also, the current study identified two services as risk factors. Clients who received transportation and supported employment services were less likely to receive competitive employment. It is plausible that individuals who need these services experience a greater severity of anxiety affecting their financial situation, ability to commute to work, and successfully perform job tasks required to obtain and retain competitive employment.

## Implications

Research has indicated that employment should be considered an effective public health intervention for people with anxiety disorders. However, employment rates of people with mental health disorders are disproportionately lower than people without mental health problems [34]. In the United States, state VR agencies have a long history of successfully helping people with disabilities achieve their independent living and employment goals [19–21]. The findings of the present study identified specific VR services (VR counseling and guidance, other services, and maintenance services) that can increase the employment outcomes of people with anxiety disorders.

Previous research also indicated that there are several barriers for people with mental health problems to obtain employment: (a) illness-related characteristics, (b) client characteristics, (c) access to services and mental health treatment, and (d) workplace and labor market characteristics [34]. The findings of this study indicated that people

with anxiety disorders can benefit from VR services, including acquisition of job skills, psychological and vocational counseling, and monetary support for sudden unexpected crises, to increase treatment engagement and employment outcomes.

The findings of the present study indicated that cash benefits, transportation services, and supported employment are negatively associated with competitive employment. These services can be viewed as a proxy of severity of disability. A Rand Corporation study indicated that the SSDI beneficiary would have been 21% points more likely to work if he or she did not receive SSDI [35]. Iwanaga et al. (2021) conducted a propensity score matching study to evaluate the effectiveness of work incentives benefits counseling (WIBC) for young adults with intellectual disabilities (ID) receiving VR services. They found that transition-age youth with ID who received WIBC services had a significantly higher rate of employment (58.9%) at the time of case closure than the group who did not receive WIBC (43.9%) [31]. The WIBC provides people the information they need to make informed decisions about work. It helps them understand how earning money may affect disability payments, healthcare, and other publicly funded benefits. It is highly likely that providing WIBC service to working-age adults with anxiety disorders will increase their motivation to work and employment outcome. Providing pharmacological treatments and psychosocial interventions to reduce anxiety symptoms may also improve VR engagement and employment outcome of VR clients with anxiety disorders.

Finally, it should be noted that many healthcare professionals who work with patients with anxiety disorders are not aware of the therapeutic effect of gainful employment and underutilize employment as a mental health intervention. State VR agencies must reach out to the healthcare community to promote the availability of VR services for people with anxiety disorders.

## Limitations

This study has the following limitations. First, the RSA-911 dataset does not include information on functional disability of the client and the intensity of services. The effect of VR services might vary depending on the functional level of clients with anxiety disorders and the intensity of the VR services. The ex-post facto design was used in the current study. Therefore, the results only indicate the relationship between the variables; a causal effect relationship cannot be determined. This study used competitive integrative employment as the outcome variable. However, competitive employment is only one aspect of successful rehabilitation.



The RSA-911 data do not include psychosocial and health outcome data.

## Conclusions

The financial, psychological, social, and health benefits of gainful employment are well documented. Helping individuals with anxiety disorders find, retain and return to gainful employment can improve their health and well-being. In the present study, we identified VR services that can improve and risk factors that can impede employment outcomes of people with anxiety disorders. We also identified medical, psychosocial, and vocational interventions that can lessen the effect of anxiety disorders on physical and mental health functioning. State vocational rehabilitation services can be a great resource for health and rehabilitation professionals who provide treatment and services to individuals with anxiety disorders.

**Authors' contributions** CK conceived of the presented idea; CK, KI, SH, ENA, JB, XC, FC wrote and developed the paper. FC checked the analysis.

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**Availability of data and material:** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Code Availability** Not applicable.

## Declarations

**Conflicts of interest/Competing interests** We have no conflicts of interest to declare.

**Ethics approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Consent to participate** Informed consent was obtained from the participants.

**Consent for publication** Not applicable.

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