

Characteristics of individuals with disabilities receiving transportation services in vocational rehabilitation

Jill Bezyak^{a,*}, Cahit Kaya^b, Sharon Hsu^c, Kanako Iwanaga^d, Jia-Rung Wu^e, Beatrice Lee^f, Madan Kundu^g, Fong Chan^h and Timothy N. Tansey^h

^a*University of Northern Colorado, Greeley, CO, USA*

^b*Giresun University, Giresun, Turkey*

^c*Independent Researcher, Seattle, WA, USA*

^d*Virginia Commonwealth University, Richmond, VA, USA*

^e*Northeastern Illinois University, Chicago, IL, USA*

^f*Michigan State University, Lansing, MI, USA*

^g*Southern University-Baton Rouge, Baton Rouge, LA, USA*

^h*University of Wisconsin-Madison, Madison, WI, USA*

Received 10 December 2021

Revised 6 January 2022

Accepted 31 October 2022

Pre-press 12 December 2022

Published 17 January 2023

Abstract.

BACKGROUND: Adequate, accessible public transportation is essential to fully address social and economic disparities that exist among individuals with disabilities. Despite removal of many physical barriers within transportation systems, significant barriers to public transportation for people with disabilities are still widespread.

OBJECTIVE: Transportation is commonly cited as an obstacle to employment for individuals with disabilities, and as a result, a thorough analysis of specific factors influencing the use of public transportation by individuals with disabilities is necessary to fully understand patterns of use.

METHOD: The current study used a national sample of individuals with disabilities in pursuit of employment to investigate characteristics that predict the receipt of transportation services by vocational rehabilitation personnel.

RESULTS: Results indicate individuals who were not employed, who were receiving welfare and/or TANF, who were homeless, who were living in rehabilitation facilities, and/or who were living in substance abuse treatment centers were more likely to receive transit services from vocational rehabilitation programs. Also, individuals with substance use problems, mental health disorders, HIV/AIDS or other immune deficiency disorders, and/or people from racial or ethnic minority backgrounds were more likely to receive transit service support from vocational rehabilitation programs.

CONCLUSION: Improvement in transportation services for individuals with disabilities is needed on a systems and individual level. State rehabilitation counselors can evaluate the extent high-risk clients identified in this study can benefit from transit services as well as other wrap around services that can improve their engagement in VR services leading to better employment outcomes.

Keywords: Disability, employment, public transportation, daily life

*Address for correspondence: Jill Bezyak, PhD, CRC, LP,
Department of Rehabilitation and Human Services Gunter Hall,

University of Northern Colorado, Campus Box 132, Greeley, CO
80639, USA. E-mail: Jill.bezyak@unco.edu.

1. Introduction

Transportation is essential for people of all ages and backgrounds to live a fulfilling and satisfying life. It plays a vital role in many aspects of daily life including access to employment, education, health care, shopping, social occasions, and multiple recreational activities. Put simply, transportation is a requirement for full participation in a community (Jansuwan et al., 2013). Despite the importance, many people in the United States do not have access to adequate transportation, and this experience is disproportionate for people with disabilities. Individuals with disabilities represent approximately 40% of the 15 million people in the United States who have difficulty getting adequate transportation services. Approximately 1.9 million individuals with disabilities report never leaving their home, and 560,000 of these individuals with disabilities indicate problems with transportation are the sole reason for not leaving home (Bureau of Transportation Statistics, 2017).

According to the American Community Survey results (ACS; Lauer & Hountenville, 2017), approximately 41 million Americans experience one or more disabilities, which is equivalent to one out of every eight Americans. People with disabilities travel less frequently and rely on public transportation more than the general population (Penfold et al., 2008). As a result, barriers to public transportation quickly impact the ability of people with disabilities to fully experience their community (Christensen, 2014). Adequate, accessible public transportation is essential to fully address social and economic disparities that exist among individuals with disabilities (National Council on Disability (NCD), 2005). By increasing independence, transportation can serve to mediate these inequalities based upon impairment and subsequently experienced as disability (Aldred & Woodcock, 2008).

Despite removal of many physical barriers within fixed-route systems since the passage of the Americans with Disabilities Act, significant barriers to overall access to public transit systems are still being reported. Barriers to public transportation for people with disabilities are widespread, but documentation in many parts of the country are lacking. A recent report from NCD (2015) provides information from select cities regarding problems and barriers to public transportation for people with disabilities. Problems with fixed-route bus transportation include inoperable lifts and ramps, false claims of inoperable lifts or ramps to avoid boarding a person with a disability,

failure to stop for a traveler with a disability, attitudinal barriers among drivers, steep slopes for ramp use, failure to clear wheelchair securement zones for people with disabilities, failure to provide stop announcements, and failure to provide route identification. Problems also exist with fixed-route rail systems including failure to provide level-entry boarding at new or altered stations, lack of an accessible alternative when level-entry boarding is not possible, inaccessible stations and cars, problems with reservations, and failure to provide dual-mode communication in the station or on the track (NCD, 2015).

A recent survey of over 4,161 individuals with disabilities in the U.S. further highlights some of the most prominent barriers to public transportation for people with disabilities. A majority of respondents indicated routes to stops and stations for public transportation were inaccessible (26%), along with inaccessible stops and stations themselves (20%) (Bezyak et al., 2017), which parallel findings from the NCD (2015) and highlight the persistence of these problems. Three out of the top six barriers to public transportation experienced by survey respondents with disabilities were related to characteristics of the driver, including drivers not calling out stops, inappropriate driver attitude, and driver's lack of knowledge. Alerting passengers to upcoming stops is a necessity for travel and was reported as a barrier by more than 30% of participants. The driver's lack of knowledge, which was frequently cited as a barrier, encompasses factors such as understanding disability etiquette and needs of specific disability types, alternate communication strategies, and proper use of assistive equipment on public transit vehicles. Climate conditions also represent a significant barrier for many people with disabilities who reside in colder climates. The path of travel to stops and stations, along with the stops and stations themselves, often become inaccessible for long periods of time due to ice and snow. Participants also reported drivers often fail to stop more frequently when ice and snow are present, further impacting the accessibility of public transportation to individuals with disabilities (Bezyak et al., 2017).

A more recent investigation of accessibility of public transportation found individuals with blindness or low vision, psychiatric disabilities, chronic health conditions, and multiple disabilities reported more problems accessing public transportation than other disability groups. Specifically, individuals with psychiatric disabilities, chronic health conditions,

and multiple disabilities reported problems accessing public transportation to get to school or work (Bezyak et al., 2019). The authors provided explanations for this finding including an increased reliance on public transportation, which likely intensifies the experience of barriers in this system, and barriers due to problems with cost, reliability, timing, and/or safety concerns.

1.1. Employment and transportation

A closer look at the impact of public transportation on employment for individuals with disabilities highlights the importance of more closely addressing this topic. According to the U.S. Dept. of Labor (2013), primary barriers to employment reported by people with disabilities include functional aspects of the disability, lack of education or training, lack of transportation, and the need for special features on the job. Although individuals with disabilities face multiple barriers to employment, transportation is continuously cited as an obstacle to pursuing and maintaining employment (NCD, 2005). According to a national study, 29% of unemployed people with disabilities consider lack of transportation a significant problem when accessing employment (Loprest & Maag, 2001). More specifically, access to transportation can limit the capacity of a person with a disability to participate in education or training programs, apply for jobs, and reliably travel to work on a daily basis (Bjerkkan et al., 2013). Furthermore, lack of reliable transportation can limit job options to local searches and lessen earnings that can be made by commuting workers (Fletcher et al., 2010).

Research also highlights specific disability groups who are significantly impacted by barriers to reliable transportation in the pursuit of employment. Individuals with visual impairments are among the more researched disability groups regarding this topic, and results collected from individuals with visual impairments, along with state vocational rehabilitation counselors serving these individuals, report significant problems with transportation impacting employment efforts (Crudden et al., 2005). Similarly, individuals with psychiatric disabilities indicated that transportation was a primary barrier to employment (Henry & Lucca, 2004). A more recent study found individuals with disabilities who were not employed experienced significantly more barriers to employment than those who were employed, and this difference was most prominent for individuals who are Deaf or hard of hearing (Sabella & Bezyak, 2019).

Although transportation is commonly reported as a barrier to employment and documentation exists to support this claim (Crudden et al., 2005; Sabella & Bezyak, 2019), there are few published studies that have attempted to empirically investigate the extent of public transportation use among individuals with disabilities in pursuit of employment. Understanding who is more likely to use and have access to public transportation systems will allow rehabilitation professionals to more adequately address disparities and barriers inherent in the transit system. A more thorough analysis of specific factors influencing the use of public transportation by individuals with disabilities who are pursuing employment is necessary to fully understand patterns of use. The purpose of the current study was to use a national sample of individuals with disabilities in pursuit of employment to investigate specific characteristics that predict the receipt of transportation services by vocational rehabilitation personnel. Results can be used to better understand patterns of transportation use among individuals with disabilities, improve the role of vocational rehabilitation programs in the provision of transportation supports and services, and more adequately address barriers in the public transportation system.

2. Method

2.1. Participants

Data for this study were extracted from the United States Department of Education and Rehabilitation Services Administration Case Service Report (RSA-911) database. The RSA-911 data provide detailed information about demographics, disability, types of vocational services, and employment outcomes for people with disabilities receiving rehabilitation services, and the data are furnished annually to RSA by state vocational rehabilitation agencies. Data from the RSA-911 for fiscal year 2013 was used for the analyses.

The sample in this study consisted of 340,735 individuals with disabilities whose cases were closed in the fiscal year 2013. Regarding type of impairments, 15.4% had sensory impairments, 22.4% had physical impairments, 32.3% had cognitive impairments and 29.9% had psychiatric impairments. The sample consisted of 191,266 men (56.1%) and 149,469 women (43.9%). Racial and ethnic backgrounds were dominated primarily by White (61.4%), followed by 23.6% African Americans, 11.4% Hispanics/Latinos,

1.9% Asian Hawaiians and Pacific Islanders, and 1.6% American Indians. The mean age of the clients was 34.91 years ($SD=15.26$). Educational background was represented by 7.1% who completed special education, 28.5% with less than a high school education, 34.1% completed high school, and 30.4% had some form of postsecondary education. About 16.1% of the participants received supplemental security income (SSI) at application for VR services, 15.4% were social security disability insurance (SSDI) recipients, and 2.4% received Temporary Assistance for Needy Families (TANF). Table 1 summarizes the demographic characteristics of the study sample.

2.2. Major variables

Receipt of transportation services was the dependent variable in this study. Transportation services was defined in the RSA-911 manual as, "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 (p. 88)." Eight demographic covariates were used as predictors of who would receive transportation services: (a) living arrangement, (b) referral source, (c) race/ethnicity, (d) age at application, (e) impairments, (f) receiving SSI, (g) receiving TANF, and (h) employed at application.

2.3. Data analysis

Multiple logistic regression analysis was used to examine predictors of propensity to receive transportation services. The odds ratios (ORs) were presented with a 95% confidence interval (CI). Data analysis was computed using the Statistical Package for the Social Sciences (version 19.0).

3. Results

The omnibus test for the model was found to be statistically significant: $\chi^2(71, N=340,735)=27,327.011, p<.001$. The Nagelkerke R^2 was computed to be .108. The results indicate that all demographic related variables were significant predictors ($p<.0001$) of receipt of transportation services. The most significant and meaningful predictors, as outlined below, point to important trends in the provision of transportation services.

Table 1
Demographic characteristics of VR consumers receiving transportation services

Demographic covariates	<i>n</i>	%
Age		
16-24	120993	35.5
25-35	59832	17.6
36-54	116562	34.2
55+	41079	12.1
Gender		
Male	191266	56.1
Female	149469	43.9
Race		
White	209268	61.4
African-American	80549	23.6
American Indian or Alaskan	5580	1.6
Asian Pacific Islander	6508	1.9
Hispanic or Latinos	38830	11.4
Education		
Special education	24153	7.1
Less than high school	96989	28.5
High school	116314	34.1
Associate degree	77196	22.7
Bachelor degree or higher	26083	7.7
Employed at application		
Yes	278283	81.7
No	62452	18.3
SSI recipient		
Yes	285750	84.6
No	54985	16.1
SSDI recipient		
Yes	288296	84.6
No	52439	15.4
TANF recipient		
Yes	332719	97.6
No	8016	2.4
Living arrangement		
Private residence	310233	91.0
Community residential/group home	7804	2.3
Rehabilitation facility	1678	0.5
Mental health facility	519	0.2
Nursing home	170	0.0
Adult correctional facility	2055	0.6
Halfway house	4633	1.4
Substance abuse treatment center	4366	1.3
Homeless/shelter	4280	1.3
Other	4997	1.5
Referral source		
Self-referral	107648	31.6
Educational Institutions (elementary/secondary)	66968	19.7
Educational Institutions (post-secondary)	9526	2.8
Physician or other medical personnel/institutions	37994	11.2
Welfare agency	5453	1.6
Community rehabilitation programs	23786	7.0
Social security administration	4348	1.3
One-stop employment/training centers	8532	2.5
Other resources	76480	22.4

Results indicate individuals who were unemployed at application were more likely ($OR=2.154$; 95% CI 2.105–2.205) to receive transportation services

than those who were employed at application. In addition, individuals referred by a welfare agency were more likely (OR = 1.285; 95% CI 1.213–1.361) to receive transportation services than those who were self-referral, and individuals receiving TANF at application were more likely (OR = 1.530; 95% CI 1.461–1.604) to receive transportation services than those who did not receive TANF. With attention to living arrangements, individuals living in rehabilitation facilities, homeless shelters or substance abuse treatment centers were more likely to receive transportation services than people who live at home. The odds for (a) people living in homeless shelters was 2.278 (95% CI 2.137–2.428); (b) rehabilitation facilities was 2.274 (95% CI 2.050–2.522); and (c) substance abuse treatment centers was 1.692 (95% CI 1.583–1.808).

Additional predictive relationships found include individuals from racial and ethnic minority backgrounds were more likely to receive transportation services than individuals who are White, with odds

ratio of 2.099 (95% CI 2.050–2.148) for Hispanic and 1.478 (95% CI 1.451–1.505) for Black. When investigating disability type, individuals with alcohol and drug abuse problems, mental health disorders, and HIV/AIDS or other immune deficiency disorders were more likely to receive transportation services than people with other impairments. The odds for (a) HIV and AIDS was 3.575 (95% CI 3.159–4.047); (b) drug abuse or dependence (other than alcohol) was 2.172 (95% CI 2.072–2.277); (c) alcohol abuse or dependence was 2.129 (95% CI 2.010–2.254); (d) depressive and other mood disorders was 1.971 (95% CI 1.904–2.040); (e) anxiety disorders was 1.890 (95% CI 1.797–1.987); (f) personality disorder was 1.881 (95% CI 1.756–2.016); (g) immune deficiencies excluding HIV/AIDS was 1.794 (95% CI 1.490–2.161); (h) mental illness (not listed elsewhere) was 1.779 (95% CI 1.679–1.884); and (i) schizophrenia was 1.711 (95% CI 1.630–1.795). The complete result of the logistic regression analysis is presented in Table 2.

Table 2
Logistic regression analysis of likelihood to receive transportation services

Independent variable	B	S.E.	Wald	Sig.	Odds
Employed at application (no)	0.767	0.012	4205.418	.000	2.154
SSI (yes)	0.143	0.011	176.882	.000	1.154
SSDI (yes)	-0.028	0.011	6.127	.013	0.973
TANF (yes)	0.426	0.024	319.216	.000	1.530
Previous closure (yes)	0.073	0.011	47.516	.000	1.076
Gender (male)	-0.035	0.008	19.194	.000	0.966
Race/ethnicity (White)			4923.767	.000	
Black	0.391	0.009	1776.844	.000	1.478
American Indian or Alaska Native	0.544	0.029	362.519	.000	1.723
Asian	0.537	0.0269	398.697	.000	1.710
Hispanic	0.741	0.012	3871.111	.000	2.099
Educational attainment (special education)			173.391	.000	
<High school	0.061	0.017	13.336	.000	1.063
High school	0.099	0.017	33.092	.000	1.104
Some college	0.149	0.018	65.203	.000	1.160
College	-0.038	0.022	2.854	.091	0.963
Impairments (cause unknown)			3588.296	.000	
Accident/injury (other than TBI or SCI)	0.438	0.021	454.273	.000	1.549
Alcohol abuse or dependence	0.756	0.029	668.305	.000	2.129
Amputations	-0.114	0.060	3.626	.057	0.891
Anxiety disorders	0.637	0.026	616.349	.000	1.890
Arthritis and rheumatism	0.498	0.032	240.549	.000	1.645
Asthma and other allergies	0.384	0.070	30.030	.000	1.468
Attention-deficit hyperactivity disorder	0.286	0.025	136.077	.000	1.332
Autism	0.052	0.030	2.985	.087	1.054
Blood disorders	0.409	0.077	28.174	.000	1.505
Cancer	0.272	0.060	20.322	.000	1.313
Cardiac and other conditions of the circulatory system	0.351	0.038	85.589	.000	1.421
Cerebral palsy	0.298	0.041	52.455	.000	1.348
Congenital condition or birth injury	0.301	0.022	186.309	.000	1.352
Cystic fibrosis	-0.065	0.192	0.115	.074	0.937
Depressive and other mood disorders	0.679	0.018	1497.442	.000	1.971

(Continued)

Table 2
(Continued)

Independent variable	B	S.E.	Wald	Sig.	Odds
Diabetes mellitus	0.328	0.033	97.113	.000	1.388
Digestive	0.038	0.081	0.226	.635	1.039
Drug abuse or dependence (other than alcohol)	0.776	0.024	1033.112		2.172
Eating disorders	0.241	0.182	1.765	.000	1.273
End-stage renal disease and other genitourinary system disorders	-0.028	0.054	0.262	.184	0.973
Epilepsy	0.377	0.044	72.279	.609	1.458
HIV and AIDS	1.274	0.063	405.816	.000	3.575
Immune deficiencies excluding HIV/AIDS	0.585	0.095	37.904	.000	1.794
Mental illness (not listed elsewhere)	0.576	0.029	383.071	.000	1.779
Mental retardation	0.048	0.021	5.132	.023	1.049
Multiple sclerosis	0.194	0.059	10.805	.001	1.214
Muscular dystrophy	0.530	0.085	39.233		1.699
Parkinson's disease and other neurological disorders	0.481	0.077	39.032	.000	1.618
Personality disorders	0.632	0.035	323.810	.000	1.881
Physical disorders/conditions (not listed elsewhere)	0.176	0.020	74.724	.000	1.192
Polio	0.467	0.109	18.396	.000	1.595
Respiratory disorders other than cystic fibrosis or asthma	0.424	0.069	38.228	.000	1.528
Schizophrenia and other psychotic disorders	0.537	0.025	472.606	.000	1.710
Specific learning disabilities	0.261	0.019	182.182	.000	1.298
Spinal cord injury	0.440	0.047	87.822	.000	1.552
Stroke	0.267	0.048	31.409	.000	1.306
Traumatic brain injury	0.379	0.033	128.560	.000	1.461
Age (16-24)			737.915	.000	
25-35	0.133	0.013	100.162	.000	1.142
36-54	0.253	0.012	415.572	.000	1.288
55+	-0.034	0.017	5.770	.016	0.961
Living arrangement (private residence)			1551.580	.000	
Community residential/group home	0.028	0.025	1.213	.271	1.028
Rehabilitation facility	0.821	0.053	240.900	.000	2.274
Mental health facility	0.337	0.091	13.658	.000	1.401
Nursing home	-0.298	0.171	3.028	.000	0.742
Adult correctional facility	-0.678	0.052	170.338	.082	0.507
Halfway house	0.443	0.032	195.932	.000	1.557
Substance abuse treatment center	0.526	0.034	241.873	.000	1.692
Homeless/shelter	0.823	0.033	638.091	.000	2.278
Other	0.338	0.030	128.422	.000	1.402
Referral source (self-referral)			1467.303	.000	
Educational institutions (elementary/secondary)	-0.270	0.016	302.923	.000	0.763
Educational institutions (post-secondary)	0.176	0.023	56.214	.000	1.192
Physician or other medical personnel or medical institutions	-0.375	0.014	688.177	.000	0.687
Welfare agency	0.251	0.029	73.392	.000	1.285
Community rehabilitation programs	-0.097	0.016	36.268	.000	0.908
Social security administration	0.202	0.032	38.751	.000	1.224
One-stop employment/training centers	0.123	0.024	26.458	.000	1.131
Other sources	0.002	0.011	0.043	.000	1.002
Constant	-2.081	0.026	6273.960	.000	.125
Model $\chi^2 = 27327.011, p < .0001$					
Pseudo $R^2 = .108$					

Note. Category in parenthesis represents the reference group for categorical variables with more than two attributes.

4. Discussion

Adequate transportation is essential for individuals with disabilities to fully experience community and live a satisfying life (Christensen, 2014). Despite the importance, many people with disabilities do not have access to adequate transportation. In fact, nearly 560,000 of individuals with disabilities indicate prob-

lems with transportation are the sole reason for not leaving home (Bureau of Transportation Statistics, 2017). Access to transportation is essential for individuals with disabilities to increase independence and begin to resolve social and economic disparities, including opportunities for employment (NCD, 2005). The purpose of the current study was to further examine the use of transportation services among

individuals with disabilities in pursuit of employment and identify predictors of the receipt of these services in vocational rehabilitation programs in order to better address systematic barriers and develop lasting solutions.

Multivariate logistic regression analysis was used to detect predictors of the receipt of transportation services among individuals with disabilities who were actively pursuing employment opportunities. Results highlight trends that are supported by previous research and can lead to improvements in policy and provision of transportation services for people with disabilities. For example, individuals who were not employed, who were receiving welfare, and/or who were receiving TANF were more likely to receive transit services from vocational rehabilitation programs. In addition, people who were homeless, living in rehabilitation facilities, and/or living in substance abuse treatment centers were more likely to receive support with transportation from vocational rehabilitation personnel. Previous research documents the significance of transportation as a barrier to employment for people with disabilities (Sabella & Bezyak, 2019), and the provision of transit services and/or support can aid in overcoming certain barriers to transportation. Cost and availability of services have been identified as specific barriers in the public transportation system for individuals with disabilities (Bezyak et al., 2017), and individuals who are unemployed, receiving welfare and/or TANF, or are experiencing homelessness likely experience these types of barriers. The provision of transit services by vocational rehabilitation agencies helps address such barriers and assists in the pursuit of employment for these individuals.

Results also indicate that individuals with disabilities with substance use problems, mental health disorders, and/or HIV/AIDS or other immune deficiency disorders are more likely to receive transit service support from vocational rehabilitation programs when compared to people with other impairments. Previous research supports these claims and reveals individuals with psychiatric disabilities and chronic health conditions experienced more barriers to accessing public transportation than other disability groups, and both these groups indicated problems with transportation when going to work or school (Bezyak et al., 2019). Barriers include cost, reliability, transfers or timing of services, difficulty planning routes, and safety concerns. Support from vocational rehabilitation helps overcome barriers including cost and concerns related to timing and

planning of routes, which then improves the likelihood of obtaining successful employment.

Individuals from racial and ethnic minority backgrounds also had a higher likelihood of received transit services from vocational rehabilitation agencies. Bezyak et al. (2019) found people with disabilities identifying as Hispanic, Latino/a, and Spanish origin reported more problems using fixed-route transportation for education and employment-related travel, among other types of travel. These barriers may be a product of cultural and language access issues, which result in more extensive transportation barriers, and disparities in income, employment, and education are well-documented for minority groups (U.S. Department of Health and Human Services, 2012). The provision of transit services at a higher rate to individuals of racial and ethnic minorities by vocational rehabilitation services may begin to address such disparities with attention to employment.

4.1. Implications for rehabilitation professionals

Transportation assistance ranks among the most common supportive services provided by state vocational rehabilitation agencies (Gilbride & Stensrud, 2010), and rehabilitation counselors can provide further assistance in removing transportation barriers to employment. Rehabilitation professionals must be aware of public transportation options and how to best assist individuals according to their individualized needs (Gilbride & Stensrud, 2010). This may involve an assessment of the activities that make up a “travel chain” to work, including trip planning, travel to and from the stop, boarding and leaving vehicles, using vehicles, and accessing trip and transfer information during the trip (Steinfeld, 2018). The counselor and consumer can work together to identify the prominent trip concerns and develop solutions. For example, a counselor may work with a consumer with psychiatric disabilities to identify concerns related to cost, trip planning, and/or safety. They may carefully review all stops and transfers needed for a trip using various resources and *in vivo* training. Rehabilitation counselors can also assist consumers in developing strategies to address safety concerns and establish clear guidelines to use public transportation as securely as possible. This may include strategies for communicating with drivers who lack disability knowledge or have inappropriate attitudes.

Rehabilitation counselors may also perform much needed advocacy and educational functions to fur-

ther reduce transportation barriers. On the local level, rehabilitation counselors may serve as informative voices advocating for increased accessibility, improvements to existing public transportation systems (Gilbride & Stensrud, 2010), or updates to relevant public policies. One example of such advocacy efforts is a transportation voucher program established at a community level. An investigation of the program found reported increases in well-being and community participation by adults with disabilities as a result of the program (Samuel et al., 2013). Similarly, a long-term project initiated by the Association of Programs for Rural Independent Living (APRIL) designed a unique transportation voucher program, which chose ten sites nationwide to implement a Traveler's Cheque concept. This program extended beyond simply providing transportation to individuals with disabilities by providing resources and support to participants, who could then meet their transportation goals independently (APRIL, 2017). Participants of the program reported great benefits and increased opportunities for employment and community participation.

In addition, rehabilitation counselors may participate in education efforts that target transit employees, which not only provides the practical information needed to support the travel of those with various disabilities, but it may also begin to confront the persistent impact of negative attitudes and stigma toward individuals with disabilities. The resolution of attitudinal barriers is a much more challenging task, which cannot be 'fixed' through any single action, but rather through deliberate forward progress in education and advocacy efforts. Creating training interventions for all drivers of public transportation vehicles, which will address and begin to change negative attitudes toward people with disabilities is an initial step. In a qualitative study of drivers' attitudes toward people with intellectual disabilities, Tillman et al. (2013) concluded that bus drivers are an essential part of the social support system, and valid information, communication, and social interaction skills training should be required additions to training programs. Rehabilitation professionals can collaborate with local transportation programs to provide these education opportunities, which may be incorporated into orientation program for drivers or other training opportunities.

Finally, this study identified several high-risk groups that require transit services (e.g., substance use problems, mental health disorders, HIV/AIDS, homelessness, and racial/ethnic minority). In addition

to providing transit services as a VR intervention, rehabilitation counselors should provide additional wraparound services and resources to increase the motivation of high-risk clients to engage and complete their vocational rehabilitation services to improve their chance of finding meaningful employment. Future research further investigating these high-risk groups could identify specific VR services that predict increased motivation to engage in VR services and ultimately obtain successful employment outcomes.

4.2. *Limitations*

There are potential limitations that should be considered when interpreting the results of this study. For example, the data was obtained through the RSA-911 database, and as a result, additional inquiries regarding specific transportation barriers were not assessed. In addition, the design for this study was descriptive and correlational in nature, and as a result, causal relationships cannot be inferred. Likewise, as the data was drawn from the 2013 RSA 911 data set, it is possible that trends have changed regarding the utilization of transportation services.

5. **Conclusion**

Employment is crucial to the health and well-being of individuals with disabilities and promotes a more fulfilling and satisfying life. Lack of transportation is a major barrier to finding and retaining employment. Despite the obvious necessity of accessible and reliable transportation, barriers to public transportation for individuals with disabilities are significant. In order to allow individuals with disabilities to begin to overcome such barriers, vocational rehabilitation organizations should provide transit services for individuals with disabilities when pursuing employment. Results of the current study indicate individuals who are unemployed, receiving welfare and/or TANF, living in rehabilitation and treatment facilities, and are homeless are more likely to receive transit services through vocational rehabilitation. Specific disability types and racial/ethnic minorities were also identified as more likely to receive supports surrounding transportation. As previous research provides support to these results, it becomes clear that improvement in transportation services for individuals with disabilities is needed on a systems level and an individual level as well. Advocacy efforts, education, and

increased awareness are needed to fully understand the impact of a disability on the individual's ability to use public transportation. The public transportation system can serve as a gateway to countless opportunities for people with disabilities, but without adequate attention and funding to address the numerous and significant barriers, public transportation will continue to impede employment efforts for people with disabilities. State rehabilitation counselors can evaluate the extent high-risk clients identified in this study can benefit from transit services as well as other wrap around services that can improve their engagement in VR services leading to better employment outcomes.

Acknowledgment

No acknowledgments reported by the authors.

Conflict of interest

No conflict of interest reported by the authors.

Ethics statement

Pre-existing, de-identified data was used for this study, so institutional review board approval was not needed.

Funding

Preparation of this manuscript was supported by funding under several grants, including the Vocational Rehabilitation Technical Assistance Center on Targeted Communities grant (H264F150003) and the Vocational Rehabilitation Technical Assistance Center for Quality Employment grant (H264K200003) from the U.S. Department of Education. However, those contents do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal government.

Informed consent

Pre-existing, de-identified data was used for this study, so informed consent was not needed.

References

- Aldred, R. & Woodcock, J. (2008). Transport: Challenging disabling environments. *Local Environment*, 13(6), 485-496. <http://doi:10.1080/13549830802259847>
- Association of Programs for Rural Independent Living. (2017). *Toolkit for operating a rural transportation voucher program*. <http://rtc.ruralinstitute.umt.edu/www/wp-content/uploads/Complete-Transportation-Voucher-Toolkit.pdf>
- Bezyak, J. L., Sabella, S. A., & Gattis, R. H. (2017). Public Transportation: An investigation of barriers for people with disabilities. *Journal of Disability Policy Studies*, 28(1), 52-60.
- Bezyak, J.L., Sabella, S., Hammel, J., McDonald, K., Jones, R.A., & Barton, D. (2019). Community participation and public transportation barriers experienced by people with disabilities. *Disability and Rehabilitation*, <http://doi:10.1080/09638288.2019.1590469>
- Bjerkan, K. Y., Nordtomme, M. E., & Kummeneje, A. (2013). Transportation to employment. *Scandinavian Journal of Disability Research*, 15(4), 342-360.
- Bureau of Transportation Statistics (2017). *Transportation difficulties keep over a half million disabled at home*. https://www.bts.gov/archive/publications/special_reports_and_issue_briefs/issue_briefs/number_03/entire
- Christensen, K. M. (2014). Socially equitable community planning: Including individuals with disabilities in democratic association of place. *Review of Disability Studies*, 5(3), 49-52.
- Crudden, A., Sansing, W., & Butler, S. (2005). Overcoming barriers to employment. Strategies of rehabilitation providers. *Journal of Visual Impairment and Blindness*, 99(6), 325-335.
- Fletcher, C.N., Garasky, S.B., Jensen, H.H., & Nielsen, R.B. (2010). Transportation access: A key employment barrier for rural low-income families. *Journal of Poverty*, 14(2), 123-144. <https://doi:10.1080/10875541003711581>
- Gilbride, D., & Stensrud, R. (2010). Job placement and employer consulting: Services and strategies. In E.M. Mora & R.M. Parker (Eds.), *Work and disability: Contexts, issues, and strategies for enhancing employment outcomes for people with disabilities*. (3rd ed.; pp. 325-361): Pro-Ed.
- Henry, A.D., & Lucca, A.M. (2004). Facilitators and barriers to employment: The perspectives of people with psychiatric disabilities and employment service providers. *Work*, 22(3), 169-182.
- Jansuwan, S., Christensen, K.M., & Chen, A. (2013). Assessing the transportation needs of low-mobility individuals: Case study of a small urban community in Utah. *Journal of Urban Planning and Development*, 139(2), 104-114.
- Lauer, E.A. & Houtenville, A.J., (2017). *Annual Disability Statistics Compendium 2016*. University of New Hampshire, Institute on Disability.
- Loprest, P., & Maag, E. (2001). *Barriers to and supports for work among adults with disabilities: Results from the NHIS-D*: The Urban Institute.
- National Council on Disability. (2005). *Access to transportation by people with disabilities: Illustrations of implementation from the United States*: Author.
- National Council on Disability. (2015). *Transportation update: Where we've gone and what we've learned*: Author.
- Penfold, C., Cleghorn, N., Creegan, C., Neil, H., & Webster, S. (2008). *Travel behavior, experiences, and aspirations of disabled people*: National Centre for Social Research.

- Sabella, S.A. & Bezyak, J.L. (2019). Barriers to public transportation and employment: A national survey of individuals with disabilities. *Journal of Applied Rehabilitation Counseling, 50*(3), 174-185. <http://doi:10.1891/0047-2220.50.3.174>
- Samuel, P.S., Lacey, K.K., Giertz, C., Hobden, K.L., LeRoy, B.W. (2013). Benefits and quality of life outcomes from transportation voucher use by adults with disabilities. *Journal of Policy and Practice in Intellectual Disabilities, 4*(10), 277-288.
- Steinfeld, E. (2018). The culture of accessible transportation. In A. Steinfeld, J.L. Maisel, & E. Steinfeld (Eds.), *Accessible public transportation: Designing service for riders with disabilities* (pp. 5-19): Routledge.
- Tillman, V., Haveman, M., Stoppler, R., Kvas, S., & Monninger, D. (2013). Public bus drivers and social inclusion: Evaluation of their knowledge and attitudes toward people with intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities, 10*(14), 307-313.
- U.S. Department of Health and Human Services. (2012). *Disparities in healthcare quality among racial and ethnic groups*. <https://archive.ahrq.gov/research/findings/nhqrdr/nhqrdr11/minority.html>
- U.S. Department of Labor (2013). Persons with a disability: *Barriers to employment, types of assistance, and other labor-related issues*. https://www.bls.gov/news.release/archives/dissup_04242013.pdf