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Association Between Case Volume of Vocational Rehabilitation Counselors and Their Clients' Employment Rate at Closure

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Large case volumes have been related to work-related stress among vocational rehabilitation (VR) counselors, leading to ineffective counseling services. Using recent survey data of VR counselors linked with their clients' records, we examined the impact of counselors' case volume on clients' employment outcomes at the exit of counseling programs. The overall successful closure rate (clients being employed) was 33%, and the high-quality closure rate (clients obtaining full-time or living wage jobs) was 23.5%. A nonlinear pattern was observed between counselors' case volume and clients' employment outcomes. Counselors with a moderate case volume (36–50 cases closed per year) had the highest successful closure rate compared with either lower or higher case volume groups. After adjusting for both clients' and counselors' characteristics, counselors with 51–75 cases closed per year had a 3.6% lower overall closure rate ($p = .03$) and a 3.4% lower high-quality closure rate ($p = .02$) than those with 36–50 cases per year. State VR agencies should be conscientious about counselors' case volume to prevent turnover of counselors. Counselors need proper training in caseload management to ensure the best counseling services.

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Keywords: case volume; vocational rehabilitation; counselor; employment outcomes; closure rate

The vocational rehabilitation (VR) system in the United States was established in 1920 and administered by individual state agencies under federal regulations. Since the Rehabilitation Act of 1973, the VR system has been providing comprehensive VR services to people with disabilities (Rehabilitation Services Administration [RSA], 2024). VR counseling is a complex and lengthy process, involving medical, psychological, and vocational assessments, as well as vocational training and job placement assistance for clients with disabilities (Commission on Rehabilitation Counselor Certification, 2024; Leahy et al., 2019). Its goal is to help clients gain competitive integrated employment (CIE), which includes wages and career advancement opportunities comparable to peers without a disability (RSA, 2024). According to the RSA, there were 872,460 eligible individuals who received VR counseling services in the fiscal year of 2023, with an overall employment rate of 53% in the fourth quarter of 2023 (RSA, 2024), much lower compared with about 75% employment rate among those without a disability (American Community Survey, 2023). Past research has demonstrated that VR counseling can significantly increase the employment rate at the exit of VR counseling (i.e., successful closure at exit or successful employment closure rate; Mann et al., 2017; O'Neill et al., 2015). However, employment outcomes vary significantly across different states and among different VR counselors (Brucker & Houtenville, 2015; Hyde & O'Leary, 2018). Thus, it is critical to understand the determinants of clients' employment outcomes of VR counseling and design strategies to improve the quality of rehabilitation counseling services.

Both clients' characteristics and contextual factors can impact employment closure rates (Sevak et al., 2019; Sherman et al., 2017). For example, individuals from lower socioeconomic status and with lower educational attainment had the lowest employment closure rates, and clients struggling with disability stigma were often subjected to undesirable closure outcomes (Bates-Maves & O'Sullivan, 2017; Hollar et al., 2008; Sherman et al., 2017; Wheaton & Wilson, 1996; Yamamoto & Alverson, 2013). In addition, discouragement to work and lack of support from family and friends resulted in the lowest employment closure rates in a recent survey on clients with disabilities (Sevak et al., 2019).

Furthermore, counselors' experience and professional training also affected their clients' employment rates (Froehlich & Linkowski, 2002; Lustig & Strauser, 2008). Counselors with a master's degree in rehabilitation counseling had a higher successful closure rate than those without (Wheaton & Berven, 1994). This was confirmed in a recent study in which VR counselors with a master's degree in rehabilitation counseling were associated with higher employment closure rates compared with those with degrees in other related fields, particularly among counselors with a working experience of fewer than 6 years (Mackay et al., 2018, 2020; Yu et al., 2023). More importantly, counselors with a master's degree in rehabilitation counseling had higher closure rates of high-quality employment, including full-time (≥30 hours/week) or living wage (≥$11.25/hour; Federal Register, 2022) jobs than counselors with master's degrees in other fields.

In addition to the counselors' educational background and other personal characteristics, it is recognized that an excessive case volume could increase work stress and the risk of burnout among counselors, thus reducing the quality of services they provide to their clients (Kierpiec et al., 2010; Landon et al., 2025; Maslach & Florian, 1988; O'Sullivan & Bates,

2014; Tabaj et al., 2015). There was also a direct inverse correlation between the size of case volume and perceived difficulties in establishing a counselor–client working alliance, a stronger predictor for successful employment closures (Bates-Maves & O'Sullivan, 2017; Kierpiec et al., 2010; Layne et al., 2004; Main, 2002; Tabaj et al., 2015; Templeton & Satcher, 2007). Work-related burnout among counselors has been reported before (Layne et al., 2004; Tabaj et al., 2015) and during the COVID-19 pandemic (Strauser et al., 2021). Such burnout may also contribute to the increased rate of turnover among VR counselors (Chan, 2003; Kierpiec et al., 2010; Landon et al., 2025; O'Sullivan & Bates, 2014). Therefore, counselors' competence in handling case volume is essential to mitigate the negative association between counselors' case volume and clients' employment outcomes. The average case volume per counselor varied significantly across states, ranging from 70 to 180 active clients per year (Dew et al., 2008; O'Sullivan & Bates, 2014). For example, the average case volume in the RSA 2022 report was about 75 in Kansas but over 150 in New Jersey (RSA, 2024). On the other hand, managing caseloads goes beyond case management and requires skills in both counseling services and resource management (Grubbs et al., 2006). Unfortunately, VR agencies often institute quota regulations irrespective of counselors' case volume capacities and community needs.

However, the association between counselors' case volume and clients' employment outcomes has not been examined with recent data. Exploring patterns of employment outcomes by counselors' case volume will help set a foundation for future research on estimating the optimal level of case volume that leads to the best performance from employment outcome perspective.

RESEARCH QUESTIONS

This study will examine the relationship between the case volume of VR counselors and the employment closure rates among their clients with disabilities from the outcome perspective. Additionally, we will explore how clients' and counselors' factors moderate the association between counselors' case volume and employment closure rates. To elucidate these issues, this study will address three research questions (RQ):

RQ1: What are the associations between counselors' case volume and clients' overall closure rate and high-quality closure rate (HQCR, measured by obtaining a full-time job or living wage job)? We hypothesize that a higher case volume will lead to a lower successful closure rate, and the above association becomes more evident for HQCR.

RQ2: Do clients' demographic and clinical characteristics moderate the above associations? We hypothesize that clients' lower education, older age, and more significant disabilities may be related to a lower closure rate, regardless of counselors' case volume, working experience, and educational training.

RQ3: Do counselors' working experience and educational training modify the above associations? We hypothesize that both fewer years of working experience and not having a master's degree in rehabilitation counseling were related to a lower closure rate.

METHODS

The University of Memphis Institutional Review Board (IRB) approved the current study before its initiation, and official support was obtained from rehabilitation agencies of the participating states: Connecticut (CT), Florida (FL), Idaho (ID), and Utah (UT).

Measurements and Procedures

The survey instruments were developed and tested by Dr. Mackay and coauthors (Mackay et al., 2018) using the Qualtrics® online survey system. Email invitations with links to the online survey were sent to all employed counselors at the participating state rehabilitation agencies in 2017. Note that although the survey was conducted before the COVID-19 pandemic, changes in social environment during and after the pandemic suggested that issues in VR services and the employment outcomes among people with disabilities might not improve significantly. The counselor's participation was voluntary, and no incentive was provided. The survey questionnaire consisted of 23 items that collected information such as counselors' demographics, highest education attained and discipline, year of graduation, years of experience as a rehabilitation counselor, perceived preparedness for work as a rehabilitation counselor, and knowledge and concerns about rehabilitation counseling.

The state rehabilitation agencies linked counselors' survey records with their case service records that were used for generating RSA-911 reports for the years 2014–2017. These individual case records included client demographics, closure status (employed or not), job title, working hours per week, and hourly wage. The client's disability type and severity were also included. The final analytic data were anonymized before being sent to the analysts.

Participants

Counselors. All VR counselors from the four states were invited to participate in the study if they were employed by the state rehabilitation agencies in 2017. The overall response rate was 69%, though there was variability across the states. In this study, we included only those counselors who had completed all survey questions, resulting in 184 counselors in the final analysis (Table 1).

Clients. We included all clients with any type of disability who obtained services from the participating VR counselors. However, to ensure the meaningfulness of findings and comparability with other studies, we excluded those who were employed at the application for VR counseling, died before exiting the program, were aged 60 years or above, were not impaired or not eligible at exit, or had disabilities that were too significant to receive employment or continue the counseling at exit. These excluded clients were known to be less likely to obtain employment. A total of 11,850 clients were excluded, resulting in 26,823 clients included in this analysis (Table 1).

Study Variables

In this study, the main outcomes were the client's employment closure status, and achieving employment at exit was considered a successful closure (or simply "closure rate" in this article). In addition, we defined HQCR as working for 30 or more hours per week (i.e., full-time job closure rate [FTCR]) or earning a minimum of U.S. $11.25 per hour (i.e., living wage job closure rate). The cutoff point for the living wage was derived from the U.S. President's Executive Order 13658 in which the minimal wage for federal contractors was set (Federal

TABLE 1. Counselors' Characteristics by Counselors' Case Volume Levels

	Case volume (%)				Total	
	1–35	36–50	51–75	75–180	*n*	%
Total (*n*, %)	46 (25)	43 (23.4)	54 (29.3)	41 (22.3)	184	100
State						
CT	4.3	18.6	25.9	0.0	24	13.0
FL	30.4	14.0	14.8	31.7	41	22.3
ID	6.5	9.3	13.0	56.1	37	20.1
UT	58.7	58.1	46.3	12.2	82	44.6
Sex						
Female	76.1	58.1	68.5	73.2	127	69
Male	23.9	41.9	31.5	26.8	57	31
Age (mean, *SD*)	34.6 (13.4)	35.9 (11.5)	35.4 (13.7)	43.4 (12.8)	37.1 (13.3)	
Years of experience (mean, *SD*)	7.3 (6.0)	7.8 (5.8)	8.8 (6.6)	10.2 (9.3)	8.5 (7)	
Six or more years of working experience						
No	56.5	51.2	48.1	53.7	96	52.2
Yes	43.5	48.8	51.9	46.3	88	47.8
Case volume (median and IQR)	18 (12–25)	46 (42–49)	58 (54–66)	90 (80–110)	52 (36–72)	
Having a master's degree						
No	19.6	14.0	7.4	19.5	27	14.7
Yes	80.4	86.0	92.6	80.5	157	85.3
Master's degree in rehabilitation counseling						
No	41.3	46.5	37.0	41.5	76	41.3
Yes	58.7	53.5	63.0	58.5	108	58.7

CT = Connecticut; FL = Florida; ID = Idaho; IQR = interquartile range; *SD* = standard deviation; UT = Utah.

Register, 2022). This arbitrary cutoff point is higher than the federal minimum wage ($7.25/hour, established in 2009) but lower than the commonly advocated fair living wage ($15/hour).

The main predictor was the counselors' volume of closed cases per year. The case volume was obtained by counting all closed clients (including those excluded from the analysis and those who were both successfully closed and not), as reported in the RSA 911 data for each counselor. Note that this definition is based on the closed cases reported in RSA 911 that were linked to the counselors' survey, which is different from the typical caseload calculation in which all active cases were included (i.e., all clients served by a counselor in a year). The sample distribution of the volume of closed cases per year in this study is presented in Figure 1. We further categorized case volume into four groups based on quartiles of the case volume: 1–35, 36–50, 51–75, and 75–180 cases per year (rounded and truncated at 180 cases). It is a common analytical method to use quartiles as the empirically derived categories (Gelman & Park, 2009). This allows us to

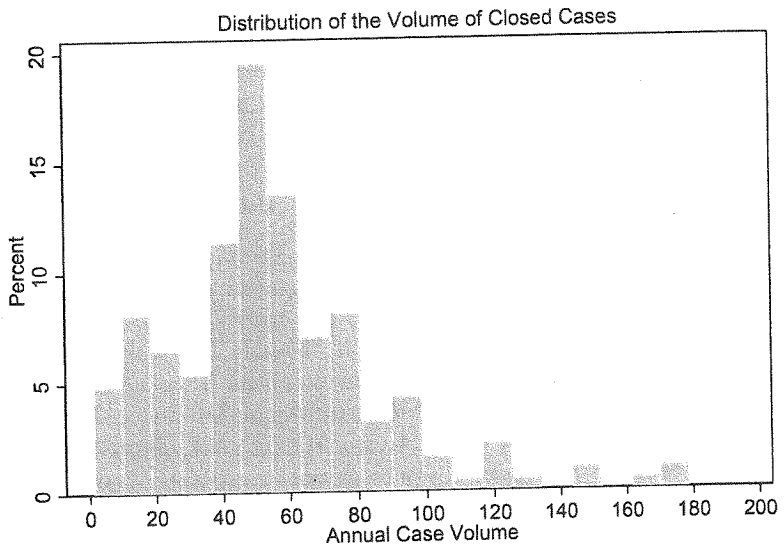

Figure 1. Case volume distribution by counselors' characteristics.

explore a nonlinear association between case volume and employment outcomes while ensuring sufficient sample size in each case volume group and avoiding the influences of extreme case volume values.

The important stratifying variables were the counselors' years of experience (less than 6 years vs. 6 years or more based on the median of working experience), having a master's degree in rehabilitation counseling or not, and the clients' significance of disability (less significant vs. more significant based on RSA disability significance variable). There are potential confounders that may influence counselors' case volume and clients' closure rates. They included state, counselors' sex and age, and clients' age and education at application (Table 1). They were included in the models for obtaining adjusted closure rates, but were not explicitly used to stratify the data.

Data Analysis

The characteristics of counselors and their clients with disabilities were described using means or medians for continuous variables, and frequencies for categorical variables. The comparisons of closure rates by case volume groups were based on the adjusted risk differences. Specifically, because clients were clustered within counselors, multilevel logistic regressions with robust variance were used to obtain adjusted risk differences with proper standard errors (Kleinman & Norton, 2009). The robust variance (or sandwich variance) accounts for the clustering structure of data and separates between-cluster variance and within-cluster variance (due to individual clients clustered within counselors; Austin & Merlo, 2017). The adjusted risk differences were differences in marginal probabilities of clients' employment, which were calculated as the predicted probabilities from the multilevel logistic models, assuming that all counselors hypothetically and sequentially assigned to one of the case volume levels, as suggested by the potential outcome-based causal framework (Imbens & Rubin, 2015). That is, the adjusted risk differences were counterfactual measures because a client could not belong to all four case volume levels. When exploring the different impacts of clients'

and counselors' characteristics, additional stratified analyses were conducted using separate multivariate models by these variables for both overall closure rate and HQCR outcomes.

Stata 16.1 (StataCorp, 2019) was used for conducting all statistical analyses, and a p value of less than .05 was considered statistical significance. However, no multiple comparisons were made.

RESULTS

Counselors' and Clients' Characteristics

A total of 184 counselors from four states were included in the analysis, about 45% of them were recruited from UT (Table 1). Counselors from ID were more likely to have higher case volumes, while those from UT were more likely to have lower case volumes. The average age was 37 years old for all counselors, but those with higher case volumes tended to be older (43 in the highest case volume group) and had more years of experience (mean = 10 years). However, there was no difference in the percentage of people having a master's degree and a master's degree in rehabilitation counseling across case volume levels. The median volume of closed cases in the whole population was 52 cases (interquartile range = 36–72) per year. The sample distribution of case volumes was also shown in Figure 1. Some counselors had very high case volumes, leading to a right-skewed distribution.

A total of 26,823 clients with disabilities were linked with the 184 counselors, 41% of them in UT (Table 2). The distributions of clients' age, race/ethnicity, and education at application were similar across case volume groups. However, clients in the highest case volume group were more likely to have more significant disabilities than those with lower case volume groups (52.6% in the highest case volume group vs. less than 43% in other groups). The overall employment closure rate was 33% for all clients; the highest rate was in the 36–50 case volume group (42.9%), and the lowest was in the case volume group of 75–180 (24.3%). Similarly, HQCR was the highest (30.3%) in the 36–50 case volume group and the lowest for those in the highest case volume group (18%). All these comparisons were statistically significant ($p < .05$). Similar patterns were present for either full-time employment or living wage employment.

RQ1: What Are the Associations Between Counselors' Case Volume and Clients' Overall Closure Rate and HQCR (Measured by Obtaining a Full-Time Job or Living Wage Job)?

The association between the counselors' case volume and the clients' closure rate was not linear, as the highest closure rate was observed in the second case volume group (36–50 closed cases per year; Table 3). Using the second case volume group as the reference, we noticed that clients in the lowest case volume group (1–35 cases per year) had a nonsignificantly lower closure rate than those in the reference group, while those in the third (51–75 cases per year) and the fourth (76–180 cases per year) groups had much lower closure rates than the reference group (unadjusted rate difference: −6.3%, $p = .05$, and −18.2%, $p < .0001$ for the third and fourth groups, respectively). Similar findings existed for HQCR (unadjusted rate difference: −6.5%, $p = .009$, and −13.4%, $p < .0001$ for the third and fourth groups, respectively). The numerical values of closure rates and rate differences for full-time jobs and living wage jobs were smaller across all case volume groups, but the general pattern persisted.

TABLE 2. Clients' Characteristics by Counselors' Case Volume Levels

	Case volume (%)				Total	
	1–35	36–50	51–75	75–180	*n*	%
Total (*n*, %)	1,523 (5.7)	5,377 (20.0)	9,115 (34.0)	10,807 (40.3)	26,823	100
State						
CT	10.0	17.2	21.4	0.0	3,030	11.3
FL	15.3	3.5	7.8	21.3	3,436	12.8
ID	4.5	13.7	17.6	63.9	9,311	34.7
UT	70.2	65.7	53.2	14.8	11,046	41.2
Age (mean, *SD*)	32.7 (12.9)	31.9 (12.6)	33.5 (12.9)	33.5 (13.9)	33.1 (13.3)	
Race						
American Indian or Alaska Native	3.9	1.6	1.5	1.7	461	1.7
Asian	2.0	1.4	1.4	0.9	326	1.2
Black or African American	9.1	8.4	8.2	5.7	1,954	7.3
Multiracial	1.1	1.1	1.6	2.5	487	1.8
Unknown	1.9	0.7	1.4	3.0	521	1.9
White	81.9	86.9	86.0	86.2	23,074	86
Education at application						
Elementary education	1.5	1.7	2.8	5.2	931	3.5
Secondary education, no HS degree	19.5	22.1	15.6	19.3	5,000	18.6
HS degree or equivalent	39.9	37.1	39.4	36.3	10,115	37.7
Postsecondary, no degree	18.5	15.2	16.7	12.3	3,940	14.7
Associate degree or vocation/tech	6.7	5.5	6.3	8.2	1,864	7
Special education	6.9	9.5	9.2	2.6	1,728	6.4
Bachelor or above	5.0	6.8	6.7	6.1	1,720	6.4
Others or missing	2.0	2.1	3.3	10.0	1,525	5.7
Current student at the application						
No	90.0	89.7	92.9	93.5	24,768	92.3
Yes	10.0	10.3	7.1	6.5	2,055	7.7
Disability status						
Less significant	61.9	64.6	57.8	47.4	14,812	55.2
More significant	38.1	35.4	42.2	52.6	12,011	44.8
Employed at closure						
No	61.3	57.1	63.6	75.7	17,982	67
Yes	38.7	42.9	36.4	24.3	8,841	33
Weekly hours working if employed (mean, *SD*)	30.0 (10.8)	30.9 (10.5)	30.1 (11.0)	30.7 (11.4)	30.5	11
Hourly wage if working (mean, *SD*)	12.0 (5.0)	11.6 (5.7)	11.6 (6.0)	10.8 (4.4)	11.4	5.5

(*Continued*)

TABLE 2. Clients' Characteristics by Counselors' Case Volume Levels (*Continued*)

	Case volume (%)				Total	
	1–35	36–50	51–75	75–180	*n*	%
High-quality employment	29.4	30.3	25.0	18.0	6,311	23.5
Full-time job	24.6	27.3	22.4	16.8	5,703	21.3
Living wage job	16.3	14.9	12.5	7.8	3,038	11.3

CT = Connecticut; FL = Florida; ID = Idaho; HS = high school; *SD* = standard deviation; UT = Utah.

RQ2: Do the Clients' Demographic and Clinical Characteristics Moderate the Above Associations?

As shown in Table 3, adjusting for the clients' demographic and clinical characteristics reduced the differences in closure rates between the highest case volume group and the reference group (second case volume group). However, the rate difference between the 51–75 case volume group and the reference group (36–50 cases) persisted and was more evident for HQCR (adjusted rate difference: -3.2%, p = .03) and for FTCR (adjusted rate difference: -2.8%, p = .04). There were no statistically significant rate differences across case volume groups among clients with less severe disabilities.

RQ3: Do Counselors' Working Experience and Educational Training Modify the Above Associations?

Table 3 also presents adjusted rate differences after further adjusting for the counselors' characteristics (Model 3). Counselors with 51–75 cases per year had a significantly lower overall closure rate (adjusted rate difference: -3.6%, p = .02), lower HQCR (adjusted rate difference: -3.4%, p = .02), and lower FTCR (adjusted rate difference: -3.0%, p = .03), compared with counselors with 36–50 cases per year.

To further examine the impact of a counselors' working experience and educational training, we conducted separate analyses stratified by these factors (Table 4). There were no differences in both overall and HQCRs between case volume groups among counselors with fewer than 6 years of experience or those without a master's degree in rehabilitation counseling. However, for counselors with 6 or more years of experience, counselors with higher case volume groups had statistically significantly lower closure rates than those with 36–50 cases per year (adjusted rate difference between 75–180 volume group and 36–50 volume group: -11.3%, p = .0009, and -13.3%, p = .001, for overall and HQCR, respectively). Interestingly, among those with a master's degree in rehabilitation counseling, those in the case volume group of 51–75 had significantly lower closure rates than those in the group of 36–50 (adjusted rate difference: -4.9%, p = .03, and -5.3%, p = .008, for overall and HQCR, respectively). This pattern persisted even among clients with less severe disabilities.

DISCUSSION

In this study, using counselors' survey data linked with their clients' RSA 911 records, we found a nonlinear association between counselors' case volume and clients' employment outcomes. Counselors with a moderate case volume (36–50 closed cases per year) had the highest successful

TABLE 3. Overall CR and HQCR by Counselors' Case Volume Levels

Outcome variable	Case volumes	Unadjusted model			Adjusted for clients' characteristics			Adjusted for both clients' and counselors' characteristics		
		CR (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted CR (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted CR (%)	Rate difference (vs. 36–50) (%)	*p*
Overall CR for all clients										
	1–35	33.5	−6.70	.12	33.2	−2.3	.39	33.0	−3.0	.23
	36–50	40.2			35.6			36.1		
	51–75	33.9	−6.3	**.05**	32.5	−3.0	.06	32.5	−3.6	**.02**
	75–180	22.0	−18.2	**<.0001**	33.9	−1.6	.29	33.7	−2.4	.24
Overall CR for clients with less significant disabilities										
	1–35	34.7	−6.0	.2	36.7	−21.0	.53	36.4	−2.9	.38
	36–50	40.7			38.8			39.3		
	51–75	33.8	−6.9	.05	36.5	−2.3	.21	36.4	−2.9	.12
	75–180	19.2	−2.1	**<.0001**	36.3	−2.5	.34	36.2	−3.1	.23
HQCR for all clients										
	1–35	27.4	−3.40	.3	24.4	−1.2	.6	24.6	−1.2	.57
	36–50	30.8			25.6			25.8		
	51–75	24.3	−6.5	**.009**	22.5	−3.2	**.03**	22.4	−3.4	**.02**
	75–180	17.4	−13.4	**<.0001**	23.6	−2.0	.34	23.5	−2.4	.24
HQCR for clients with less significant disabilities										
	1–35	30.3	−3.5	.36	29.2	−1.2	.69	29.4	−1.2	.68
	36–50	33.8			30.4			30.6		
	51–75	27.9	−5.9	**.03**	28.1	−2.3	.17	28.0	−2.6	.12
	75–180	17.7	−16.0	**<.0001**	29.3	−1.1	.64	29.1	−1.5	.53
FTCR for all clients										
	1–35	22.9	−4.70	.14	20.2	−2.8	.18	20.4	−2.8	.16
	36–50	27.6			23.0			23.2		
	51–75	21.6	−6.0	**.01**	20.2	−2.8	**.04**	20.2	−3.0	**.03**
	75–180	16.1	−11.5	**<.0001**	21.7	−1.3	.48	21.5	−1.7	.36
FTCR for clients with less significant disabilities										
	1–35	26.2	−4.6	.2	25.1	−2.8	.29	25.3	−2.7	.29
	36–50	30.8			27.9			28.1		
	51–75	25.4	−5.3	**.05**	26.0	−1.9	.24	25.9	−2.2	.19
	75–180	16.6	−14.1	**<.0001**	27.5	−0.4	.86	27.4	−0.7	.77
LWCR for all clients										
	1–35	15.3	0.30	.86	13.6	1.6	.26	13.6	1.4	.32
	36–50	15.0			12.0			12.2		

(*Continued*)

TABLE 3. Overall CR and HQCR by Counselors' Case Volume Levels (*Continued*)

Outcome variable	Case volumes	Unadjusted model			Adjusted for clients' characteristics			Adjusted for both clients' and counselors' characteristics		
		CR (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted CR (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted CR (%)	Rate difference (vs. 36–50) (%)	*p*
	51–75	12.6	−2.4	.12	10.6	−1.4	.13	10.5	−1.7	.08
	75–180	7.9	−7.1	**<.0001**	12.1	−0.1	.95	12.0	−0.2	.88
LWCR for clients with less severe disabilities										
	1–35	18.0	0.6	.80	17.0	2.0	.31	17.0	1.7	.39
	36–50	17.4			15.0			15.3		
	51–75	15.4	−2.0	.23	13.8	−1.2	.29	13.7	−1.6	.18
	75–180	9.2	−8.2	**<.0001**	15.6	0.6	.72	15.6	0.3	.88

Note. HQCR: high-quality closure rate, including both FTCR: full-time closure rate (30 or more hours/week), LWCR: living wage closure rate (hourly wage ≥ 11.25). CR: closure rate. All models are based on the generalized estimation equation method in which the clients are assumed to be clustered within the counselors. The estimated rates are marginal probabilities based on the model predictions (called marginal prediction in statistics). Model 1: unadjusted. Model 2: adjusted for clients' age, race, education, disease severity, and state. Model 3: adjusted for clients' age, race, education, disease severity, state, and counselors' age, sex, working years, and rehabilitation training. In the stratified analysis, the stratified variable will be removed from the variable, but the model is still adjusted for other covariables. Bold values indicate $p < .05$.

closure rate compared with either lower case volume groups or higher case volume groups. After adjusting for both clients' and counselors' characteristics, counselors with 51–75 cases per year had a 3.6% lower overall closure rate ($p = .03$) and 3.4% lower HQCR ($p = .02$) than those with 36–50 cases per year. Considering that the overall closure rate was 33% and the HQCR was 23.5%, such rate differences were substantial and clinically meaningful.

There is no simple explanation for the impact of counselors' case volume on the clients' employment outcomes. Lower case volumes may be due to a lower demand for VR services in the community or the counselors' inability to handle a larger case volume. As shown in our study, counselors in the lowest case volume group tend to have fewer years of experience than those with higher case volumes. In addition, lower employment closure rates may indicate a lower quality of VR services provided to clients, leading to clients leaving the incapable counselors. In our study, although the closure rate was lower among the lowest case volume group, the rate differences compared with the reference (moderate case volume group) were not statistically significant, suggesting that such rate differences may not be due to differences in the quality of services.

On the other hand, although more experienced counselors may be able to handle larger case volumes, a high case volume can increase the risk of burnout among counselors or reduce a counselor's attention to each client, resulting in lower quality of services and ineffective counseling. It is well recognized in human services, including health workers and rehabilitation counselors, that working with vulnerable populations can lead to work-related stress, and a large case volume for VR counselors will increase work-related stress and lead to burnout and high turnover among counselors (Landon et al., 2024; Pitt et al., 2013). When counselors

TABLE 4. Adjusted Rate Differences for Overall and High-Quality Closure Rates by Counselors' Working Experience and Education, Adjusted for Both Clients' and Counselors' Characteristics

	Overall closure rates			High-quality closure rates		
	Adjusted closure rate (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted closure rate (%)	Rate difference (vs. 36–50) (%)	*p*
Fewer than 6 years of working experience						
All clients						
1–35	28.4	-6.5	.08	20.2	-3.3	.30
36–50	34.9			23.4		
51–75	31.2	-3.8	.11	20.9	-2.5	.13
75–180	34.9	0.0	.99	25.2	1.8	.35
Clients with less severe disabilities						
1–35	29.2	-9.8	.05	23.1	-5.7	.19
36–50	39.1			28.8		
51–75	35.6	-3.4	.22	27.7	-1.1	.61
75–180	38.0	-1.0	.74	31.0	2.1	.42
Six or more years of working experience						
All clients						
1–35	38.3	-1.2	.67	30.6	-9.7	.75
36–50	39.5			31.6		
51–75	35.4	-4.2	.05	25.4	-6.2	**.02**
75–180	28.3	-11.3	**.0009**	18.3	-13.3	**.001**
Clients with less severe disabilities						
1–35	41.8	0.4	.90	34.5	0.5	.90
36–50	41.3			34.0		
51–75	37.7	-3.7	.16	29.0	-5.0	.09
75–180	29.5	-11.8	**.0006**	24.2	-9.8	**.02**
With MRC						
All clients						
1–35	34.7	-4.6	.16	26.3	-2.2	.43
36–50	39.3			28.5		
51–75	34.3	-4.9	**.03**	23.2	-5.3	**.008**
75–180	36.0	-3.3	.28	25.8	-2.8	.32
Clients with less significant disabilities						
1–35	38.4	-3.7	.35	31.4	-2.6	.49
36–50	42.2			33.9		

(*Continued*)

TABLE 4. Adjusted Rate Differences for Overall and High-Quality Closure Rates by Counselors' Working Experience and Education, Adjusted for Both Clients' and Counselors' Characteristics (*Continued*)

	Overall closure rates			High-quality closure rates		
	Adjusted closure rate (%)	Rate difference (vs. 36–50) (%)	*p*	Adjusted closure rate (%)	Rate difference (vs. 36–50) (%)	*p*
51–75	38.1	−4.1	.10	29.1	−4.8	.04
75–180	37.9	−4.3	.20	30.4	−3.6	.27
Without MRC						
All clients						
1–35	29.6	−0.2	.95	21.4	0.5	.86
36–50	29.8			20.8		
51–75	30.6	0.8	.76	21.4	0.6	.71
75–180	29.2	0.6	.79	19.6	−1.3	.55
Clients with less significant disabilities						
1–35	31.5	−1.6	.75	25.1	0.7	.85
36–50	33.1			24.4		
51–75	33.7	60.0	.85	26.0	1.7	.42
75–180	32.3	−0.8	.81	26.1	1.8	.56

Note. All models are based on the generalized estimation equation method in which the clients are assumed to be clustered within the counselors. The estimated rates are marginal probabilities based on the model predictions (called marginal prediction in statistics). Models were adjusted for clients' age, race, education, disease severity, state, and counselors' age, sex, working years, and rehabilitation training. In the stratified analysis, the stratified variable will be removed from the variable, but the model is still adjusted for other covariables.
MRC = master's degree in rehabilitation counseling.

suffered unbearable emotional exhaustion, depersonalization, preconceived prejudices, and alienation from the cases, counselors would experience work-related burnout, and the rates of successful closure dropped precipitously (O'Sullivan & Bates, 2014). In addition, as discussed in the introduction, effective counseling often relies on the counselor–client working alliance, a collaborative relationship that facilitates the clients' possibility of finding employment in a competitive job environment (Kierpiec et al., 2010). A large case volume may reduce the counselor's capacity to establish such an alliance. Therefore, it is important to provide training in case volume management so that counselors can effectively cope with large case volumes (Froehlich & Linkowski, 2002; Grubbs et al., 2006; Neubert et al., 2018).

Nonetheless, the mechanisms on how counselors' case volume levels affect their clients' employment outcomes are not clear. Several theories have been proposed to explain the negative relationship between high case volume and lower successful closure rate and suggest possible solutions. If this negative relationship was due to overwhelming stress and compassion fatigue, then the solution lies in the improvement of the work environment and stress coping mechanism (Park, 2009; Tabaj et al., 2015). However, if the negative relationship was due to work culture and organizational bureaucracy, then the remediation should be geared toward a culture of ethical decision-making (Lane et al., 2012). In addition, it might be the counselors' perceived caseload management difficulties that inadvertently affected the successful rehabilitation rate outcomes of clients. Thus, rectifying the wrong perception among counselors could reduce burnout (Lu et al., 2023; Payne, 1989).

It is also of interest that the negative association between higher case volume and lower successful closure rate was more evident among counselors with more than 6 years of experience or with a master's degree in rehabilitation counseling. The underlying mechanisms may be complicated. For example, more experienced counselors may have higher case volumes, and counselors with rehabilitation counseling training may be more willing (or required) to take more complicated cases. Therefore, they may have lower employment closure rates partly due to their more challenging cases.

However, it should be noted that counselors' caseload is only one of the factors that influence the clients' employment outcomes. Other external factors such as the severity of the clients' disability, low adherence to appointments, and job availability in the community could also contribute to the unsuccessful case closure (Cooper & Pearce, 1980; Rogers et al., 2011; Wang & Ethridge, 2022). Our research group has identified some knowledge and skills gaps between counselors and is exploring the most effective methods to train VR counselors (Yu et al., 2023).

Furthermore, the goal of rehabilitation counseling is to help clients be employed in a competitive integrated environment. In our previous studies, we have proposed the concept of HQCRs, which include both full-time jobs and living wage jobs (Mackay et al., 2018, 2020). In this study, we have found that the rates of getting either a full-time job or a living wage job were relatively low, and only about 11% of clients obtained a living wage job, despite about 33% of clients obtaining any kind of job. This implies that only one-third of jobs that clients obtained were paid competitively. We also found that the negative impact of higher case volumes on HQCR was more evident and independent of both clients' and counselors' characteristics. These differences were consistent across counselors' years of working experience and educational training levels. It is conceivable that coaching clients to obtain high-quality jobs requires more knowledge and skills in rehabilitation counseling, better work alliance between counselors and clients, and also additional vocational training for clients. Since higher case volume may reduce counselors' attention to each client, they will impede the quality of services for helping clients obtain high-quality jobs. Future research on the effectiveness of VR counselors should focus on high-quality jobs and CIE. More importantly, in addition to observational studies, researchers need to adopt experimental studies to examine the effectiveness of interventions with high-quality jobs and CIE as targeted outcomes (Wehman et al., 2018). Evidence-based practice has been called for in the VR counseling practice, and experimental studies will provide the strongest evidence (Fleming et al., 2013; Leahy et al., 2018).

Our study has some limitations. Despite a larger sample size of clients, there were only 184 counselors included in the analyses. Counselors' response rates were lower among states such as CT and ID. This precludes us from conducting between-state comparisons. Some counselors had incomplete responses and were excluded from the final analysis as well. Limiting to counselors who responded to our survey may lead to selection bias. For example, about 86% of clients in our data were White, a percentage significantly higher than national reports. Therefore, our study may not be generalizable to other regions. In addition, we did not have detailed clinical information regarding the clients' disability severity, counseling processes, and other socioeconomic information. We also did not know the detailed practice patterns of counselors. Therefore, residual confounding that may affect the clients' employment outcomes exists. Furthermore, we did not have contextual information regarding community resources, the local labor market and resources, and social support from family and friends for clients. However, our multilevel analysis treats counselor as the

cluster variable, thus somewhat alleviating the bias due to the lack of contextual information. In addition, our average case volume per counselor was smaller than that reported nationally, and the overall closure rate was also slightly lower than the national average (RSA, 2024). This is likely due to the differences in the definition of case volume, as we only used the closed cases reported in the RSA 911 data, while in practice, counselors' caseload calculation includes all active cases. Some extreme observations in case volume values may also distort the results, but we have no rationale to exclude those extreme values. Finally, due to the limitation of data, we could not quantitatively establish a specific optimal case volume for counselors, though having an explicit cutoff point for case volumes would facilitate policymaking in allocating resources for VR counseling. Our research should be replicated in other states and augmented with a larger and more diverse sample of counselors. We are currently expanding our research in this direction.

CONCLUSIONS AND IMPLICATIONS

In summary, VR counselors with a moderate case volume had the highest closure outcomes, including high-quality closure outcomes. Both lower and higher case volumes were related to lower employment closure rates. State VR agencies should actively assess counselors' case volumes to ensure the best performance among counselors. Preventing counselor turnover while providing better counseling services requires an optimal caseload. In addition, for regions with higher demands for VR services but with a lower supply of VR counselors, state VR agencies should allocate more resources to train and recruit additional counselors to the regions.

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