Intellectual and Developmental Disabilities

Factors Affecting Employment for Early Adults with Intellectual and Developmental Disabilities: Influence of Supported Employment

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Abstract:	Public policy directives have emphasized Competitive Integrated Employment (CIE) as the primary employment outcome for individuals with intellectual and developmental disabilities (IDD), yet their overall employment rates remain low. Supported Employment (SE) offers evidence-based vocational rehabilitation with personalized workplace support for CIE success. This study aims to predict CIE outcomes for youth and young adults with IDD by evaluating demographics, SE, and adjunctive state vocational rehabilitation agency (SVRA) services. Analyzing data from 67,884 individuals using hierarchical logistic regression, we found SE significantly associated with CIE success. Adjunctive SVRA services, including workplace support, job placement, and job search assistance, also played crucial roles. These findings emphasize SE's efficacy in helping youth and young adults with IDD achieve CIE, guiding vocational professionals.

Abstract

Public policy directives have emphasized Competitive Integrated Employment (CIE) as the primary employment outcome for individuals with intellectual and developmental disabilities (IDD), yet their overall employment rates remain low. Supported Employment (SE) offers evidence-based vocational rehabilitation with personalized workplace support for CIE success. This study aims to predict CIE outcomes for youth and young adults with IDD by evaluating demographics, SE, and adjunctive state vocational rehabilitation agency (SVRA) services. Analyzing data from 67,884 individuals using hierarchical logistic regression, we found SE significantly associated with CIE success. Adjunctive SVRA services, including workplace support, job placement, and job search assistance, also played crucial roles. These findings emphasize SE's efficacy in helping youth and young adults with IDD achieve CIE, guiding vocational professionals.

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Factors Affecting Employment for Early Adults with Intellectual and Developmental Disabilities: Influence of Supported Employment

Participation in competitive integrated employment (CIE) improves the economic well-being, mental health, and overall quality of life of people with intellectual and developmental disabilities (IDD; Taylor, et al., 2022). The Workforce Innovation and Opportunity Act (WIOA) of 2014 defined CIE as full or part-time work at minimum wage or higher, with wages and benefits similar to those without disabilities performing the same work, *and* fully integrated with coworkers without disabilities. It also emphasized CIE as the preferred employment outcome for people with disabilities receiving services from state vocational rehabilitation agencies. Despite the clear personal benefits of CIE to individuals with IDD, and the support of policy to increase CIE outcomes, a significant gap in employment rates persists between individuals with disabilities and those without (WIOA, 2014).

According to the U.S. Bureau of Labor Statistics (2023), employment to population rate for working-age adults with disabilities was 37.2 %, while that for working-age adults without disabilities was 75.2%. This inequality in employment participation is even more pronounced for individuals with IDD. Although there is no direct source for labor force participation for individuals with IDD in the general population, data from the National Core Indicators project reveals that during 2020–2021, merely 15% of working-age adults supported by state IDD agencies were able to secure paid jobs within the community (National Core Indicators, 2023). In 2018, only 21.5% of individuals with IDD were receiving day support services in integrated employment from IDD agencies (Winsor, et al., 2022). In addition, while the number of individuals participating in segregated work has declined, the number of individuals receiving day support services from IDD agencies who were participating in non-work settings was on the

rise (Winsor, et al., 2022). This implies that employment services are still supplementary rather than constituting a comprehensive systemic change (Mank, et al., 2003; Nord, et al., 2016; Winsor, et al., 2022).

Supported Employment

Supported Employment (SE) is an evidence-based intervention for individuals with disabilities, even those with the most significant disabilities, that provides individualized workplace supports needed for successful job performance in competitive integrated employment settings (Wehman, et al., 2018, 2023). A key aspect of SE is the integrated "place then train" approach, a process of first securing CIE for an individual and then providing needed workplace support (Wehman, 1981). The SE approach comprises four distinct phases, including Phase 1: Strengths-Based Assessment, Phase 2: Marketing and Individualized Job Development, Phase 3: On-the-Job Training and Supports, Phase 4: Ongoing (Long-Term) Supports (Brooke, 1997; Schall, et al., 2015; see Table 1).

Utilizing the RSA-911 Database for VR Research

The Rehabilitation Services Administration Case Service Report (RSA-911) database is a rich data source that has tracks services delivered by state vocational rehabilitation agencies (SVRA) and employment outcomes experienced by individuals with disabilities seeking employment from the time of referral to through the closure of services where the individual gains or does not gain employment (US Department of Education, 2019). Deidentified data from this database is available to researchers for the purposes of secondary analysis of outcomes and services delivered. Much of the analysis of data has been descriptive in nature (e.g., Kim, et al., 2023; Revell et al., 2023). Recently, researchers have used the data from the database to link vocational rehabilitation services to employment outcomes achieved (Iwanaga et al., 2021, 2023;

Kaya, et al., 2023a, 2023b; Li, et al., 2023; Riesen, et al., 2022; Roux, et al., 2021; Wehman, et al., 2014). To date, this research has mainly analyzed the impact of single services on employment outcomes. These studies have included the impact of work incentives benefits counseling (Iwanaga, et al., 2021; Kaya, et al., 2023a), postsecondary education (Li, et al., 2023); supported employment (Iwanaga, 2023), and customized employment (Kim, et al., 2023). In addition, some researchers have examined the impact of specific interventions on special populations as identified in the RSA-911 database such as autistic postsecondary students (Roux et al., 2021; Kaya et al., 2023b) and transition age youth with IDD (Wehman, et al., 2014).

One study examined the impact of more than one service on the acquisition of CIE (Nord & Hepperlen, 2016). They limited their inclusion of variable to job-related services only. They included three services in their logistic regression model. They were job search, job placement, and on-the-job support. They considered the impact of each service individually, in all possible combinations of two, then all three together. While each service individually increased the odds that a person with a disability gained employment (odds ratios of CIE acquisition ranged from 1.39 to 3.40) and the provision of any two services further increased the odds of gaining CIE (odds ratios of CIE acquisition ranged from 4.03-9.26), the most powerful impact was observed when all three services were delivered. In fact, when all three services were delivered, participants were 16.39 times more likely to gain CIE than those who receive one or two job-related services (Nord & Hepperlen, 2016). The data used in this study was from the 2011 fiscal year, three years before the passage of WIOA when the definition of supported employment was changed and updated in the current RSA-911 codebook (US Department of Education, 2019; WIOA, 2014). With respect to the age ranges explored using RSA-911, most research on

employment outcomes has been conducted on emerging to early adulthood (ages 18 to 35; Li, et al., 2023; Qian, et al, 2018).

Conclusions from this research indicate that the SVRA job services offered to individuals with disabilities are comprised of disability benefits counseling, supported employment, job search, job placement, and on-the-job support. All of these studies have been limited by the nature of the data itself. As a national database, the RSA-911 data is dependent upon the accuracy of the SVRA inputted data according to guidance from the RSA-911 codebook definitions. If the definition of the services included in the codebook are open to interpretation, there is likely to be recording differences between SVRAs.

Evidenced-Based Definition versus RSA Definition of Supported Employment

Some of the differences in CIE outcomes associated with SE provision through VR agencies may stem from the federal definition of "SE services" in WIOA (2014). Taken directly from WIOA, RSA defines SE services as "ongoing support services, including customized employment, and other appropriate services needed to support an individual with a most significant disability in maintaining supported employment" (US Department of Education, 2019). In addition to the SE service category, RSA separately identifies *Adjunctive Services* in the funding formula for a) Job Search Assistance, b) Job Placement Assistance, and c) Workplace Support. The fundamental problem with this coding is that the adjunctive services effectually are the comprehensive evidenced-based practice described in controlled research as SE (i.e., Assessment, Individualized Job Development, and On-the-Job Training/Long-Term Support). Therefore, VR service recipients who participate in SE may not be getting the evidenced-based package of SE supports with all of the phases found to be highly effective in controlled research designs. This lack of clarity in RSA-911 coding could account for some of the variable CIE

outcomes reported among VR recipients and between research-based demonstrations of SE versus community implementation of SE (Schall, et al., 2015). In controlled research studies, the application of SE using the comprehensive four-phase process has been highly effective in achieving CIE outcomes for individuals with IDD with large odds ratios (OR = 0.85) and medium to large effect sizes (Cohen's d = 0.50 – 0.93; Qian, et al., 2018). In contrast, studies using data from the RSA-911 database examining outcomes for SE recipients have shown variable results with small to medium effect sizes of SE (Qian, et al., 2018).

In light of the continuing poor employment rate despite years of public policy efforts to increase CIE among individuals with IDD, our study aims to investigate the influence of SE and adjunctive services as predictors of CIE for emerging and young adults with IDD. More specifically, we seek to understand the amount of variance in CIE outcomes accounted for by SE, along with additional adjunctive SVRA services. We acknowledge that there is evidence that the income limits placed on individuals who receive federal disability benefits, such as Supplemental Security Disability Income, may act as a disincentive for CIE (Gelber, et al., 2017; Iwanaga, et al., 2021; Maestas, et al., 2013). Thus, we also included an adjunctive SVRA service called work incentives planning and assistance. More precisely, in this study 'adjunctive SVRA services' are defined as 'job search assistance, job placement assistance, workplace support, and work incentives planning and assistance.' In addition, we also recognize that individual-level characteristics, such as gender, race, ethnicity, education, and other demographic characteristics of service recipients impact CIE outcomes (Revell, et al., 2023; Riesen, et al., 2023; Taylor, et al., 2021). Therefore, we decided to take into account the effect of these demographic characteristics to assess the influence of the full SE process (i.e., SE plus four adjunctive SVRA services) on CIE more precisely. By comprehensively examining these factors, we seek to

provide valuable insights into the factors that contribute to successful CIE outcomes. Having a clearer understanding of the impact of the adjunctive services, or full SE process, will ultimately be useful in informing effective policies and practices aimed at enhancing employment opportunities for youth and young adults with IDD.

Purpose of the Study

This study aims to investigate the influence of SE plus four additional adjunctive SVRA services as predictors of CIE for emerging and young adults with IDD. The specific research questions that guided this study were:

1. What demographic variables contribute to predicting CIE outcomes for youth and young adults with IDD?
2. How much does SE predict CIE outcome beyond the variance already explained by demographic covariates of youth and young adults with IDD?
3. What adjunctive RA services contribute to the prediction of CIE outcome beyond the variance already explained by demographic covariates and SE of youth and young adults with IDD?

Methods

Study Cohort

The U.S. Department of Education, Rehabilitation Services Administration Case Service Report (RSA-911) dataset is the administrative data collected by each SVRA on individuals who exited services in a program year (U.S. Department of Education, 2019). The RSA-911 data includes information on demographics, disability, service interventions, and employment status when recipients exit services. The data set from the RSA-911 for PY 2021 was used for the present analyses as it is the most current dataset available at the time of this study. The inclusion

criteria for this study were: (a) ages between 18 and 35 (i.e., transition age youth and young adults), (b) a primary diagnosis of IDD at intake, and (c) case closed as successfully employed or not employed after receiving SVRA services. For this study analysis, IDD were identified if RSA-911 data's primary disability sources are Intellectual Disability, Attention-Deficit Hyperactivity Disorder (ADHD), Autism, Cerebral Palsy, Congenital Condition or Birth Injury, Epilepsy, or Specific Learning Disabilities (SLD). While ADHD or SLD may not fit the traditional definition of IDD according to medical diagnostic criteria, the RSA-911 dataset does not have a specific category for developmental disabilities and does not allow to check choices all that apply (U.S. Department of Education, 2019). VR clients with ADHD and SLD often experience functional challenges in areas such as attention, executive functioning, and academic performance, which can significantly impact their ability to succeed in employment settings. Therefore, this study included VR consumers with ADHD and SLD in the analysis. The sample in this study included 67,884 transition age youth and young adults who met the inclusion criteria and whose cases were closed in PY 2021. The sample included 43,529 (64.1%) males and 24,355 (35.9%) females. The largest number of SVRA recipients were White Americans (n=38,896, 57.3%, followed by African American (*n*=14,009, 20.6%), Hispanic (*n*=11,730, 17.3%) and other (*n*=3,249, 4.8%). The mean age of the samples at intake was 21.92 years (*SD* = 4.71). Approximately 41,140 participants (*n*= 60.6%) held a high school diploma or special education certificate, while 7,138 participants had not completed high school (10.5%). Around five percent of the participants (*n*=3,593, 5.3%) completed a 4-year college or higher. About forty percent were referred by an educational institution (*n*=27,776, 40.9%), while 32.3% (*n*=21,896) referred by themselves, friends, or family. Almost half were low-income families (*n*=32,488, 47.9%).

Predictor Variables

The demographic characteristics of study participants, SE and adjunctive SVRA services were considered predictors for this study. Demographic variables included ages (with ages from 18 to 21 as the reference group), gender (with male as the reference group), race (with White as the reference group), ethnicity (with non-Hispanic as the reference group), education (with less than high school as the reference group), referral source (with self/family/friends as the reference group), low-income family (with not low income family as the reference group). Adjunctive SVRA services included job search assistance, job placement assistance, workplace support, and work incentives planning and assistance. Job search assistance helps individuals find suitable employment by offering services such as resume preparation, identifying job opportunities, honing interview skills, and establishing contacts with companies. Job placement assistance involves referring individuals to specific job opportunities, resulting in interviews, regardless of job attainment. Workplace support is provided to stabilize and enhance job retention for those already placed in employment. Work incentives planning and assistance is for people who want to work but are unsure how it might affect their disability benefits or what support they might be eligible for. The reference category for all SVRA services was participants who did not receive the specific service (No) compared to participants who had received the specific service (Yes). The demographic characteristics and the number of participants who received each of the SVRA services is presented in Table 2.

Outcome Variable

The outcome variable in this study was competitive integrated employment after receiving and exiting SVRA services (CIE vs unemployment at SVRA services closure).

Data Analysis

The IBM SPSS Statistics Version 27.0 for Mac was used for all analyses. Descriptive statistics were computed to report frequencies and mean values for the predictor and outcome variables. The primary analysis was hierarchical logistic regression analysis (HLRA; Hoyt et al., 2008; Wilson & Lorenz, 2015). HLRA is a statistical method used to examine how predictor variables relate to a binary outcome, while also considering the influence of other variables (Hoyt et al., 2008; Wilson & Lorenz, 2015). This analysis includes adding predictors as a set to observe how this affects the model's ability to predict the outcome, as well as to determine the importance of each predictor in explaining variations in the outcome. HLRA is particularly valuable for hypothesis testing, especially when hypotheses involve assessing the additional variance in the outcome explained by one set of predictors, beyond what was already explained by predictors included in earlier steps of the analysis (Hoyt et al., 2008; Wilson & Lorenz, 2015). In this study, the variable sets were entered sequentially: Step 1– demographic covariates (age, gender, race, education, referral sources, low income), Step 2– SE, Step 3– adjunctive SVRA services (i.e., job search assistance, job placement assistance, workplace support, and work incentives planning and assistance). Multicollinearity was measured by variance inflation factors (VIF) and tolerance. A VIF value exceeding 4.0, or tolerance less than 0.2 indicates a problem with multicollinearity (Hair et al., 2010). In the present study, all VIF values were less than 4.0 and all tolerance were greater than 0.2, indicating that multicollinearity was not a concern.

Results

First Step

In the first step of the HLRA, demographic variables were entered, including age, gender, race, education, referral sources, and low income. The HLRA results are presented in Table 3. The omnibus test for the logistic regression model was found to be statistically significant, χ^2(14,

N =67,884) = 3257.07, $p < .001$. The prediction accuracy of the model is 60% higher than 50%. These indices showed a good model fit. The Nagelkerke R^2 was computed to be .06, indicating weak association between the predictors and the outcome variable (Smith & McKenna, 2013). The results showed all variables to be significant predictors of CIE. There was a significant difference in the odds of achieving CIE between White Americans with IDD and Black Americans with IDD (odds ratio [OR] = 0.75, 95% CI [0.72, 0.78]) and White Americans with IDD and Hispanic/Latinx Americans with IDD (OR = 0.73, 95% CI [0.70, 0.77]). Compared to participants with IDD with less than high school diploma, there was a significant difference in the odds of achieving CIE for participants who completed 4-years college or higher (OR = 5.37, 95% CI [4.90, 5.88]), for participants with an associate degree (OR = 3.32, 95% CI [2.99, 3.69]), and for participants with high school diploma or equivalent (OR = 1.87, 95% CI [1.77, 1.98]). For referral sources, compared to participants referred by self, family or friends, there was a significant difference in the odds of achieving CIE for participants referred by educational institution (OR = 0.83, 95% CI [0.79, 0.86]) and for participants referred by medical or mental health providers (OR = 0.88, 95% CI [0.80, 0.96]). There was a significant difference in the odds of achieving CIE between low-income participants and higher-income participants (OR = 0.87, 95% CI [0.84, 0.90]).

Second Step

In the second step, SE (with not receiving SE as the reference group) was entered. The omnibus test for the logistic regression model was found to be statistically significant, χ^2(15, N =67884) = 8228.72, $p < .001$, and the prediction accuracy of the model is 65% (greater than the baseline of 50%), indicating a good model fit. The Nagelkerke R^2 was computed to be .15, indicating weak association between the predictors and the outcome variable. Although it was

still weak association, SE explained an additional 9% variance in a CIE outcome after controlling for the effect of demographic covariates. There was a significant difference in the odds of achieving CIE between participants who received SE and participants who did not receive SE (OR = 5.82, 95% CI [5.52, 6.14]).

Final Step

In the final step, job search assistance, job placement assistance, workplace support, and work incentives planning assistance (with not receiving each service as the reference group) were entered. The omnibus test for the logistic regression model was found to be statistically significant, $\chi^2(19, N = 67884) = 15314.68$, $p < .001$, and the prediction accuracy of the model is 73%, indicating a good model fit. In the final step, adjunctive SVRA services for supported employment significantly increased the Nagelkerke R^2 from .15 to .27 and identified additional significant VR services (job search assistance, job placement assistance, and workplace support) that significantly improved the odds of transition-age youth and young adults with IDD finding CIE. These adjunctive SVRA services explained an additional 12% variance in CIE outcome after controlling for the effect of demographic covariates and SE. There were significant differences in the odds of achieving CIE between participants who received workplace support and participants who did not receive workplace support (OR = 4.77, 95% CI [4.48, 5.09]); between participants who received job placement assistance and participants who did not receive job placement assistance (OR = 2.70, 95% CI [2.57, 2.82]); between participants who received job search assistance and participants who did not receive job search assistance (OR = 1.55, 95% CI [1.48, 1.63]).

In the final model, all demographic variables were still significantly predicted a CIE outcome. Among demographic variables, education attainment variables (i.e., completing 4-years

college or higher and completing associate degree) were the most significant predictors for CIE. Compared to participants with IDD without high school diploma, participants with IDD completing 4-years college or higher (OR = 6.98, 95% CI [6.34, 7.68]); and participants with IDD with an associate degree (OR = 3.95, 95% CI [3.54, 4.42]); were more likely to achieve CIE. SE was still a significant and the second strongest predictor of a CIE outcome. Participants who received SE were more likely to achieve CIE than participants who did not receive SE (OR = 5.58, 95% CI [5.27, 5.90]). Finally, the addition of adjunctive SVRA services accounted for an additional 12% variance in CIE outcome. This showed adding adjunctive SVRA (job search assistance, job placement assistance, workplace support) enhanced the predictive power of CIE outcomes.

Discussion

Effect of Demographic Variables

This study evaluated how much SE predicted CIE outcomes beyond the variance already explained by demographic covariates of youth and young adults with IDD. In the present study, all demographic covariates significantly predicted CIE outcome in the final model even after controlling other demographic variables, SE, and Adjunctive SVRA services variables. Among the demographic variables, education attainment predicted the CIE outcome significantly. Those with IDD with higher education were more likely to achieve CIE than youth and young adults with IDD without a high school diploma. This indicates that it is important to provide youth and young adults with IDD with access to higher education, at least a high school diploma or equivalent diploma. SVRAs provide services for post-secondary education or training, such as four-year college or university, graduate college or university, and vocational training. These services enable youth and young adults with IDD to meet the demands of a working environment

by gaining more professional skills and knowledge and having practical experience regarding the tools and environments in which they will work. While education attainment levels are influenced by various factors beyond disability categories, it's worth noting that participants with non-intellectual disabilities could potentially influence the outcomes observed in this study. Therefore, future research should examine the nuanced interactions between disability categories, demographic factors, and education attainment to provide a more comprehensive understanding of the pathways to employment success for individuals with IDD.

Participants with low-income were less likely to achieve CIE compared to participants who were not low-income. White youth and young adults with IDD were more likely to achieve CIE than other race/ethnic groups. Specifically, Black participants were 0.25 less likely, and Hispanic participants were 0.27 less likely to achieve CIE. Also, female participants were less likely to achieve CIE than male participants. SVRA counselors and community rehabilitation providers may need additional training in cultural responsivity to meet the employment support needs of those consumers to ensure they achieve CIE.

Effects of SE and Adjunctive VR Services

Despite these demographic patterns of concern, the findings in this study show that there are effective interventions that result in the acquisition of CIE for emerging and early adults with IDD. SE had the strongest impact on the acquisition of CIE. Specifically, youth and young adults with IDD who received SE are 5.82 times more likely to achieve CIE than those who did not, even after controlling for the effect of demographic variables. For the final model, SE remained a stronger predictor than other adjunctive SVRA services, indicating that SE significantly helped youth and young adults with IDD achieve CIE. The “adjunctive” SVRA services—job search assistance, job placement assistance, and workplace support— also significantly predicted CIE

for youth and young adults with IDD. Especially, workplace support emerged as the strongest predictor of CIE among these significant adjunctive SVRA services. Youth and young adults with IDD who received workplace support are 4.77 times more likely to achieve CIE than those who did not receive workplace support after controlling for the effect of demographic variables and other SVRA services. In addition, participants who received job placement assistance are 2.7 times, and participants who received job search assistance are 1.55 times more likely to achieve CIE than those who did not receive those services. Workplace support, as defined in RSA-911 data, refers to a short-term assistance service given to individuals who have secured employment. Its purpose is to stabilize their job placement and improve their ability to retain the position. Consequently, workplace support is a significant adjunctive VR service for supported employment. Despite accounting for the impact of SE, workplace support remained a significant predictor. This outcome highlights the crucial nature of offering support to acclimate individuals to their new work environment at the initial stages of employment. Notably, even when considering these adjunctive services, SE retained its position as the most powerful predictor for CIE among emerging and early adults with IDD. This underscores the necessity for a comprehensive strategy that begins from the job search phase and extends to providing workplace support – a central component of SE. This holistic approach emerges as crucial for enabling individuals with IDD to successfully attain CIE.

It is important to mention that although SE significantly predicted CIE for youth and young adults with IDD, the percentage of participants who used the services was only 13.7% in this study. Similarly, job search assistance, job placement assistance, and workplace support were also less utilized, 16.7%, 19.4%, and 11.6%, respectively. These findings indicated that youth and young adults with IDD may not have enough access to those effective services. It is critical

for SVRAs to consider an effective service delivery mechanism for youth and young adults with IDD and engage them to receive the SVRA services that are needed to achieve their employment goals. In the case of supporting emerging and early adults with IDD in the acquisition of CIE, packaging SE plus job search assistance, job placement assistance, and workplace support resulted in better outcomes for SVRA clients seeking CIE. This may explain the difference between research-based findings and SVRA findings where there is a significant difference between the rates of CIE for individuals with IDD. Providing more comprehensive services and ensuring that employment support service providers are well trained in all aspects of these services would likely result in improved CIE outcomes.

In addition, youth and young adults with IDD with low-income may be recipients of benefits from one or more disability supports (e.g., social security disability programs and public health care programs). Those individuals and their families may be highly concerned about the potential disruption or reduction of public benefits and eligibility resulting from increased employment activity and earnings. Work incentive benefits counseling helps beneficiaries of social security disability programs understand how earning money may affect public benefits, allowing for informed choices about employment options. However, only 5.5% of participants in this study received work incentive benefits counseling. Iwanaga et al. (2021) showed that benefits planning increased employment opportunities and outcomes for individuals with ID. Therefore, it is critical to ensure that youth and young adults with IDD from low-income backgrounds have access to these services and provide information to assuage economic concerns related to the impact of income on financial benefits.

Implications

The implications of these findings hold importance for researchers, policymakers, and service providers alike. First, while research has defined SE as a four-phase service for individuals with IDD, this study reveals inconsistencies in the delivery of these elements among participants. This is underscored by the very low utilization rates of these critical services. In addition, there exists a mismatch between the research-based and validated delivery of SE, which entails the delivery of all four phases as an integral part of the SE model, and the definition of these services as "adjunctive" in the RSA system. The term adjunctive implies that these services are not required and can be flexibly combined as needed. However, researchers argue that SE cannot be effectively provided without providing job search assistance, job placement assistance, and workplace support services. Further, the addition of work incentives planning assistance is a critical element in helping individuals with IDD enter the workforce and maintain essential public health and financial support. These findings underscore the need to conceptualize SE as a comprehensive package of services to meet the employment needs of job seekers with IDD. Achieving this entails the development of fidelity measures and the delivery of competency-based training for service providers. Enhanced transparency regarding the specific components integral to successful SE implementation for individuals with IDD could instill greater confidence among consumers.

To improve access to evidence-based SE, researchers should develop a fidelity scale encompassing core practices proven efficacious for job seekers with IDD. For example, job seekers with IDD using SE often have limited work histories and less understanding of their work preferences, necessitating additional time for gathering information crucial for the job development phases. Further, individuals with IDD tend to require a higher intensity of on-the-job instruction and workplace modification (Wehman, et al., 2017; Wehman, 2023). These

factors should constitute fundamental elements within a fidelity scale. Future research should focus on establishing fidelity markers specific to SE for job seekers with IDD.

Public policy and regulations regarding the delivery of SE have been vague about what constitutes quality SE services for individuals with IDD. The lack of a minimum standard of SE service delivery may have resulted in highly variable quality. This, in turn, may have discouraged individuals with IDD seeking services. Policy makers could strengthen SE regulations by providing specific guidance regarding the essential elements of SE in the regulations themselves. The Rehabilitation Services Administration has not, to date, evaluated the quality of SE services except through the closure process. While this process promises incentives to community rehabilitation agencies for successful closures, this system might inadvertently disincentivize the provision of services to those with the most significant disabilities, specifically those with IDD (Hall, et al., 2011). Policy makers could build more incentives in the system by rewarding quality service delivering in addition to outcomes only.

Finally, community rehabilitation programs and state vocational rehabilitation agencies could enhance the quality of SE services by addressing the employment support profession. Employment specialists supporting individuals with IDD require intensive training across distinct skill sets. Specifically, they need intensive training in person-centered assessment practices, the use of scored task analyses to teach multistep work and social skills, structured repeated trials to teach discrete tasks, behavioral rehearsal, visual and self-directed prompting procedures, and the installment of self-management procedures to address behaviorally challenging situations (Wehman et al., 2017). In addition, employment specialists often assist people with IDD in navigating the natural changes that occur in business to maintain employment over time (Brooke, et al., 2018). These skills are unique to meeting the needs of

individuals with IDD. Such skill sets are acquired through a combination of didactic learning, and on-the-job training. To date, such training has been suggested, but not uniformly mandated (Ham, et al., 2022).

Limitations

There are several limitations that should be considered when interpreting the present findings. First, this study used the RSA-911 database, secondary data with an ex-post-facto design; therefore, we cannot make cause-and-effect inferences regarding the relationships between the predictors and the outcome variable. Second, SE and the adjunctive SVRA services were dichotomously coded, received versus not received. Consequently, the quality, fidelity, intensity, or duration of SE and the adjunctive SVRA services were not considered. This is a critical consideration because Wehman, et al. (2021) asserted that measuring the quality and intensity of interventions provided throughout the SE process is imperative. Thus, further research is needed to develop the fidelity of SE implementation, especially for people with IDD, and to investigate the quality of SE services being provided by SVRAs.

Third, the coding of the CIE at case closure variable is solely defined as whether the individual is employed 90 days from initial employment. The RSA-911 database does not provide longer-term tracking to monitor job retention. Future research should extend the frame of observation beyond the conventional 90-day case closure criterion to examine the long-term effects of SE services for young people with IDD. Additionally, clinical assessment instruments must be developed and validated specifically for transition-age youth and young adults with IDD with competitive integrated employment outcomes.

Conclusion

The study findings underscore the importance of SE for enhancing the CIE outcomes of youth and young adults with IDD. Specifically, the efficacy of SE in facilitating CIE attainment, particularly when supplemented by SVRA services, is highlighted. These insights also shed light on the crucial elements that can elevate the quality of SE services. As a result, the knowledge gleaned from this study has the potential to inform the development of fidelity components within the realm of SE.

Compliance with Ethical Standards

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Conflict of Interest: The authors declare that they have no conflict of interest.

Data availability statement

This study used the U.S. Department of Education, Rehabilitation Services Administration Case Service Report (RSA-911) dataset.

Rehabilitation Services Administration (2022). *Case service report (RSA-911).* U.S. Department of Education, Office of Special Education and Rehabilitative Services, Rehabilitation Services Administration. https://rsa.ed.gov/performance/rsa-911-policy-directive

Informed Consent: Informed consent was obtained from all individual participants (state vocational rehabilitation consumers) through state vocational rehabilitation counselors through their service provision.

Ethical 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.

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Table 1
Four Phases of Supported Employment (Schall, et al., 2015)

Phase	Description
Phase 1: Strengths-Based Assessment	The job seeker works with an employment specialist to complete person-centered planning, undergo disability benefits counseling, complete observations, and community-based assessments to develop a profile of employment strengths, interests, and preferences.
Phase 2: Marketing and Individualized Job Development	The job seeker and employment specialist engage in a job search to find the best employment match. This phase includes all activities associated with job searching, job on-boarding, job negotiation, job analysis, workstation modification and design.
Phase 3: On-the-Job Training and Supports	The employment specialist partners with the business *and* the new employee to ensure the employee performs their job independently. This phase includes direct instruction to ensure the new employee meets the employer's expectations with minimal direct support. It also includes facilitating the natural supports of the workplace allowing the business to assume supervision and support of the worker. Once the employee completes 80% or more of their job independently, they move to the final phase of SE.
Phase 4: Ongoing (Long-Term) Supports	During this phase, employment supports are provided sporadically to address the employee or employer's training needs including retraining new business protocols, adjusting to changes in job responsibilities or requirements, adjusting to new managers or co-workers, providing disability awareness training to managers and co-workers.

Table 2
*Participant Characteristics (*N*=67,884)*

	n	%
Outcome variable	30,740	45.3 %
Competitive Integrated Employment (Yes)		
Demographic variable		
Gender		
Male	43,529	64.1 %
Female	24,355	35.9 %
Age		
Age 18-21	42,337	62.4 %
Age 22-35	25,547	37.6 %
Race		
White	38,896	57.3 %
Black	14,009	20.6 %
Other	3,249	4.8 %
Ethnicity		
Hispanic	11,730	17.3 %
Education		
Less than High School	7,138	10.5 %
High School or Special Education diploma	41,140	60.6 %
Associate degree	2,058	3.0 %
4 year college or higher	3,593	5.3 %
No information	13,955	20.6 %
Referral sources		
Self/friends/family	21,896	32.3 %
Educational institution	27,776	40.9 %
Community-based rehabilitation organization	2,476	3.6 %
Medical and mental health provider	2,294	3.4 %
Other	13,442	19.8 %
Low-income family (Yes)	32,488	47.9 %
Services Variables		
Supported Employment (Yes)	9,294	13.7 %
Job search assistance (Yes)	11,351	16.7 %
Job placement assistance (Yes)	13,152	19.4 %
Workplace support (Yes)	7,883	11.6 %
WIPA (Yes)	3,724	5.5%

Table 3
*Hierarchical Logistic Regression Analysis for Prediction of Employment Outcome (*N*=67,884)*

		Each step					Final model				
	R^2	**Beta (*B*)**	**S.E.**	**Wald χ^2**	***p* level**	**Odds Ratio**	**Beta (*B*)**	**S.E.**	**Wald χ^2**	***p* level**	**Odds Ratio**
Step1 Demographic variable	**.06**										
Age (Ages 18-21)		0.29	0.02	207.25	<.001	1.33	0.18	0.02	70.27	<.001	1.20
Gender (Male)		-0.15	0.02	77.77	<.001	0.86	-0.11	0.02	35.05	<.001	0.90
Race (White)				327.96	<.001				213.78	<.001	
Black		-0.29	0.02	202.37	<.001	0.75	-0.33	0.02	211.20	<.001	0.72
Hispanic		-0.31	0.02	200.12	<.001	0.73	-0.07	0.02	7.73	0.005	0.94
Other		-0.20	0.04	26.67	<.001	0.82	-0.14	0.04	10.94	<.001	0.87
Education (Less than HS)				1457.31	0.00				1822.68	0.00	
HS diploma or equivalent		0.63	0.03	483.33	<.001	1.87	0.55	0.03	313.39	<.001	1.74
Associate degree		1.20	0.05	508.81	<.001	3.32	1.37	0.06	587.76	<.001	3.95
4 years or higher		1.68	0.05	1303.11	<.001	5.37	1.94	0.05	1557.27	<.001	6.98
No information		0.69	0.03	463.99	<.001	2.00	0.61	0.04	294.11	<.001	1.84
Referral (Self-family Friends)				92.88	<.001				43.52	<.001	
Educational institution		-0.19	0.02	77.16	<.001	0.83	-0.04	0.02	2.85	0.09	0.96
CBRO		0.07	0.04	2.38	0.12	1.07	0.01	0.05	0.09	0.77	1.01
Medical/Mental health providers		-0.13	0.05	8.58	0.00	0.88	-0.05	0.05	1.15	0.28	0.95
Other		-0.11	0.02	23.28	<.001	0.90	-0.16	0.03	40.33	<.001	0.85

Low-income (No)		-0.14	0.02	74.03	<.001	0.87	-0.19	0.02	114.04	<.001	0.83
Step2 SE	**.15**										
SE (No)		1.76	0.03	4126.97	0.00	5.82	1.72	0.03	3619.21	<.001	5.58
Step3 Adjunctive SVRA services	**.27**										
Job search assistance (No)		0.44	0.03	315.70	<.001	1.55	0.44	0.03	315.70	<.001	1.55
Job placement assistance (No)		0.99	0.02	1776.19	0.00	2.70	0.99	0.02	1776.19	<.001	2.70
Workplace support (No)		1.56	0.03	2310.07	0.00	4.77	1.56	0.03	2310.07	<.001	4.77
WIPA (No)		-0.08	0.04	4.20	0.04	0.92	-0.08	0.04	4.20	0.04	0.92
Constant							-1.24	0.04	1110.79	<.001	0.29

CBRO= Community-based rehabilitation organization, SE=Supported Employment, WIPA = Work Incentives Planning and Assistance
Parenthesis in variables indicate reference group