
Services for Consumers Who Are Deafblind: Vocational Rehabilitation Agency Service Models Utilized and Their Effectiveness

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Abstract

Introduction: Little is known about how state-federal vocational rehabilitation agencies provide services to consumers who are deafblind. The purpose of this study was to investigate these service models and their effectiveness. **Methods:** A mixed-methods approach was utilized with data from interviews with 51 vocational rehabilitation agency administrators and the Rehabilitation Services Administration Case Service Report. Information about how these agencies serve deafblind consumers was combined with data from 2,119 consumers served by those agencies to determine competitive employment rates based on service model type. Descriptive statistics, chi-square tests of independence, and logistic regression analysis were utilized. **Results:** Four vocational rehabilitation agency service models were identified: specialist, professional collaboration, specialist plus professional collaboration, and miscellaneous. Significant differences in competitive employment closure rates were found based on service model type, in both univariate and multivariate analyses. The specialist and professional collaboration models were superior to miscellaneous models. **Discussion:** This study is the first empirical evaluation of the effectiveness of vocational rehabilitation services for consumers who are deafblind. The results support two previous recommendations about providing services to consumers who are deafblind: establish a deafblind coordinator or specialist position and use a dual-case approach (collaboration between general-service agencies and those for people who are visually impaired). **Implications for agencies:** To improve competitive employment outcomes for individuals who are deafblind, vocational rehabilitation agency administrators should explore options for specialized deafblind positions and promote collaboration within and beyond their agency.

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Keywords

deafblind, vocational rehabilitation services, employment

Deafblindness, or combined hearing and vision loss, affects less than 1% of the U.S. population (Sui, 2017). Prevalence is low even when defined broadly to include minimal vision impairment and mild hearing loss, although prevalence increases substantially at older ages (Swenor, Ramulu, Willis, Friedman, & Lin, 2013). Working-age adults with combined hearing and vision loss are much more likely to be out of the labor force (i.e., not employed and not seeking employment—61.7% versus 19.0%) or unemployed (11.8% versus 5.3%) and are far less likely to be employed (33.7% versus 76.8%) than are people without disabilities (Sui, 2017; U.S. Census Bureau, 2017).

Deafblindness is not restricted to total blindness and total deafness but instead can involve ranges of hearing and vision loss. It is defined in the Helen Keller National Center Act (1992) as a combination of legal blindness (or progressive vision loss) and severe hearing impairment (or progressive hearing loss) that causes “extreme difficulty in attaining independence in daily life activities, achieving psychosocial adjustment, or obtaining a vocation” (29 U.S.C. § 1905 [2]). Use and interpretation of the term “deafblind” differs among researchers and practitioners (e.g., Wittich, Southall, Sikora, Watanabe, & Gagne, 2013), and specific criteria for identifying individuals as deafblind varies by state and organization. Despite meeting

criteria specified in the definition of deafblindness, some individuals may not identify with this term: Some may consider themselves deaf with a visual impairment or blind and hard-of-hearing (38th Institute on Rehabilitation Issues [IRI], 2015); others may consider themselves dual-sensory impaired.

The service needs of this population have received limited research attention; however, vocational training and vocational services have consistently been identified as important needs for youth and adults who are deafblind in the available literature (McDonnell & Cmar, 2018; Ehn, Möller, Danermark, & Möller, 2016; Petroff, 2001, 2010; Watters, Owen, & Munroe, 2004; Wolf, Delk, & Schein, 1982). Accordingly, many people who are deafblind could benefit from the assistance of state-federal vocational rehabilitation agencies to obtain employment. The 38th IRI (2015) identified individuals who are deafblind as an underserved population, indicating the Rehabilitation Services Administration’s belief that the population has been inadequately served by vocational rehabilitation agencies. In addition to being underserved, low expectations by professionals, including vocational rehabilitation counselors, have been identified as a problem for people who are deafblind (38th IRI, 2015; Watters-Miles, 2014; Wolf et al., 1982).

One challenge regarding vocational rehabilitation service provision for consumers who are deafblind is that each agency potentially takes a different approach to service delivery since evidence-based practices for service provision have not been established for this population. The 38th IRI provided recommendations for vocational rehabilitation agencies when serving this population, including the following: (a) establish a

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statewide coordinator for deafblind services, (b) open cases for deafblind consumers in both the general and blind agency (dual cases), (c) attend trainings and workshops to enhance skills to work with deafblind consumers, (d) develop customized employment opportunities and include deafblind consumers under supported employment policies, and (e) provide consumers with support service providers.

The model state plan for vocational rehabilitation services for persons who are deaf, deafblind, hard of hearing, or late deafened also provided information about and recommendations for service provision to this population (Watson, Jennings, Tomlinson, Boone, & Anderson, 2008), which coincide with IRI recommendations. Suggestions included the following: (a) have a statewide coordinator of deafblind services whose singular responsibility is to plan and create rehabilitation services programming for deafblind consumers, (b) have two professionals provide services: a counselor for the deaf people and a counselor for the blind people, and (c) have a position for a rehabilitation counselor for the deafblind people. Likewise, Ingraham, Carey, Vernon, and Berry (1994) suggested the need for a statewide coordinator for services for deafblind consumers. Although not within the context of vocational rehabilitation services, the importance of service providers who are able to communicate effectively with consumers who are deafblind has been discussed (Everson & Goodall, 1991; Vernon & Duncan, 1990).

The Workforce Innovation and Opportunity Act (2016) places renewed emphasis on high-quality, competitive employment for all consumers and instructs vocational rehabilitation agencies to provide the necessary services and supports to enable those with the most significant disabilities to achieve competitive integrated employment. Most

vocational rehabilitation consumers who are deafblind are categorized as having a most significant disability, and vocational rehabilitation agencies need to be prepared to effectively serve these individuals to assist them in obtaining quality competitive employment. Low expectations for this population in terms of employment because of the severity of the disability are unacceptable. Vocational rehabilitation consumers who are deafblind have received little research attention and no attention in terms of identifying factors that are important to help them achieve competitive employment.

Although recommendations have been made about service provision for individuals who are deafblind, little information is available about how vocational rehabilitation agencies currently provide services to this population. Data are lacking regarding the models these agencies use to provide services and the effectiveness of those service models. The purpose of this study is to provide current information in this area, answering the following research questions:

1. How are vocational rehabilitation agencies providing services to consumers who are deafblind?
2. What service models do these agencies use to serve consumers who are deafblind?
3. Which service models are most effective in terms of competitive employment outcomes for consumers who are deafblind?
4. Do service models utilized and effectiveness of service models differ by agency type?

Method

This study utilized a mixed-methods approach, incorporating qualitative data analyses and integrating qualitative with quantitative data for analyses (Creswell,

2009). Data came from two sources: interviews with state vocational rehabilitation agency administrators of combined and separate, or blind, agencies and Rehabilitation Services Administration Case Service Report (RSA-911) data. The interview and RSA-911 data were combined to investigate consumer outcomes based on agency service models.

SURVEY OF AGENCY ADMINISTRATORS

Participants

Directors of combined and blind vocational rehabilitation agencies in the United States were invited via e-mail to participate in a semistructured interview that addressed multiple topics, including service provision for consumers who are deafblind. If the agency director was not available to participate in the interview, he or she was asked to appoint a designee. Telephone interviews which lasted approximately 1 hour were conducted by two researchers (not the study authors) between October 2016 and June 2017. Administrators from all 51 vocational rehabilitation agencies participated in the study, representing 27 combined agencies and 24 blind agencies in the 50 U.S. states and District of Columbia. Twenty-seven agency respondents were agency directors and 24 respondents held another type of administrative position (e.g., deputy director, director of field service, bureau chief for blind services).

Interview questions

Administrators were asked to "Please describe how your agency provides services to consumers who are deafblind." Three prompts were used to obtain specific information of interest: "Who within the agency provides services to this population?," "Do you have specialized personnel?," and, for blind agencies only: "Do you ever collaborate with the general vocational rehabilitation agency in your state to

provide services?" Responses were recorded and transcribed, and the transcripts were utilized as the data source.

Data analyses

Two researchers (the study authors) analyzed the survey data using directed content analysis principles (Hsieh & Shannon, 2005). First, they reviewed all transcripts and coded data segments into categories using inductive and deductive approaches. Most categories coincided directly with the research questions; however, a few categories emerged from the data. Each researcher used a separate Excel file to code the data. Next, researchers conducted second-level coding by identifying and counting similarities and variations in responses within each category. To promote reliability and validity, the researchers independently coded all transcripts, compared their coded data, and discussed any differences in coding to come to a consensus. After coding the data into categories, four general service models used by agencies were identified.

RSA-911 DATA

Sample

RSA-911 data for federal fiscal years 2013, 2014, and 2015 were utilized for this study, which includes information for all consumers whose cases were closed by vocational rehabilitation agencies during each fiscal year. Consumers included in the study had a (a) primary or secondary disability of deafblindness, (b) primary disability of deafness plus a secondary disability of any level of vision loss, or (c) primary disability of legal blindness plus a secondary disability of any level of hearing loss. The sample was limited to consumers who received services (i.e., in closure status "exited with an employment outcome" or "exited without an employment outcome, after receiving services") from one

of the 51 agencies that participated in the interviews and were between the ages of 18 and 72 at case closure. Data from three fiscal years were combined to maximize the sample size ($N = 2,119$).

Variables

The outcome variable was *competitive employment*, defined as a case being closed in one of the following employment categories: employed with or without supports in an integrated setting (employer job), self-employment, or Business Enterprise Program, and compensated at or above the federal minimum wage. The primary independent variable was *service model* utilized by the agency, a categorical variable with four categories representing the service models identified from the interview data. The other independent variable was agency type (blind versus combined agency), which was coded 1 for blind agencies and 0 for combined agencies.

Several control variables were included in the multivariate model to account for consumer characteristics: age (in years at application), education level at case closure, female gender, Hispanic ethnicity, minority status, receipt of Supplemental Security Income, receipt of Social Security Disability Insurance, and competitive employment at application. Education was a continuous variable (range of 0–12), with each higher level of education assigned a higher number (0 = *no formal education*; 12 = *any degree above a master's*). The remaining control variables were dichotomous, coded 1 for *yes* (characteristic present) and 0 for *no* (characteristic not present).

Data analyses

Descriptive statistics (frequencies and percentages) were utilized to describe competitive employment outcomes by service model and

agency type. Chi-square tests of independence were used to evaluate differences in competitive employment outcomes based on service model, both overall and by agency type. Logistic regression was used to determine whether service model and agency type predicted competitive employment outcomes when consumer characteristics were included in a multivariate model. Phi coefficients (for chi-square analyses) and odds ratios (for logistic regression) were utilized as effect size measures. SAS Version 9.4 was used to conduct all statistical analyses.

Results

PROVISION OF VOCATIONAL REHABILITATION SERVICES TO CONSUMERS WHO ARE DEAFBLIND

Specialized personnel

Twenty-two vocational rehabilitation administrators (43.1%) reported that their agency had one or more specialized deafblind positions. Job titles and roles varied; for simplicity, we used administrators' descriptions of the professionals' main roles to group the specialized positions into two categories: deafblind coordinator (13 agencies) and direct service provider (9 agencies). Some deafblind coordinators are responsible for coordinating or consulting on all deafblind cases in the state. The coordinators work with vocational rehabilitation counselors and other direct service staff members to serve consumers who are deafblind but generally do not work directly with consumers. In one agency, deafblind coordinators serve as internal consultants who advise other agency staff (e.g., counselors, vision rehabilitation therapists, orientation and mobility specialists) on the latest and most appropriate assistive technology, training aids, and devices for deafblind consumers. That agency's administrator stated that the coordinators "help us to make sure that we devise a plan

of services that really meet that individual's needs and that we are doing an appropriate job of communicating with the individual and getting the right resources for that." Another agency has three deafblind coordinators who primarily provide direct support to vocational rehabilitation counselors but also interact with consumers who are deafblind by conducting home visits and coordinating with vocational rehabilitation counselors to meet consumers' needs.

Most deafblind specialists who function as direct service providers are vocational rehabilitation counselors who only or primarily serve consumers who are deafblind. One administrator stated that counselors for the deafblind "have particular knowledge of deafblind culture and communication techniques, which makes service delivery more effective." In another agency, the direct service provider was a communications rehabilitation teacher who worked at the state rehabilitation center.

Although the remaining 29 agencies (56.9%) do not have specialized deafblind positions, 7 agencies have counselors or other individuals or staff members who have some degree of training relevant to deafblindness but who serve additional populations. For example, one blind agency has several vocational rehabilitation counselors who are fluent in American Sign Language.

Who provides services

Administrators most commonly reported that counselors for the blind ($n = 17$, 33.3%) or counselors specializing in each sensory disability (i.e., a counselor for the blind people and those for the deaf; $n = 16$, 31.4%) jointly serve consumers who are deafblind. Nine administrators (17.7%) indicated that the primary service provider is dependent on consumer needs, communication method, or consumer choice. Other responses as to who

provides services included dedicated counselors for the deafblind people ($n = 4$, 7.8%), external providers ($n = 3$, 5.9%), and rehabilitation counselors for the deaf ($n = 1$, 2.0%). One agency (2.0%) does not serve consumers who are deafblind; in that state, schools for deaf and blind students serve deafblind consumers (including adults).

Collaboration

Administrators of the 24 blind agencies were asked whether their agency collaborated with the general agency in their state to provide services to consumers who are deafblind. Six blind agency administrators (25.0%) reported consistent use of interagency collaboration where counselors in their agencies work with counselors for the deaf in general agencies to serve consumers who are deafblind. An additional 10 blind agency administrators (41.7%) indicated that they collaborate with the general agency on occasion, although collaboration is not the primary way their agency serves this population. For example, several administrators reported that joint cases with the general agency are more likely when consumers are deafblind and have additional disabilities or complex needs. In addition, 10 of the 27 combined agency administrators (37.0%) indicated that their agency primarily serves consumers who are deafblind through collaboration between counselors for the blind and counselors for the deaf. Overall, 16 of the 51 agency administrators (31.4%) reported consistent collaboration between professionals as a method of providing services.

Contractors and community resources

Twenty administrators (39.2%) indicated that their agency uses external providers to deliver services to consumers who are deafblind. For example, administrators reported contracting with community rehabilitation

providers and residential rehabilitation programs, including Helen Keller National Center (HKNC) for Deaf-Blind Youths and Adults. Thirteen administrators (25.4%) mentioned using HKNC as a resource. The extent of collaboration and consultation with HKNC varied across agencies, with some sending consumers to HKNC for residential training and others consulting with HKNC regional field representatives. Three administrators (5.9%) indicated that their agency uses contractors to provide most or all services to deafblind consumers. Five administrators (9.8%) mentioned that they provide support services to consumers with deafblindness through contractors. A few administrators reported that they consult with or receive assistance from their state schools for deaf students or schools for blind students when serving deafblind consumers. Several administrators also mentioned contracting with interpreters to facilitate communication with consumers who are deafblind.

VOCATIONAL REHABILITATION SERVICE MODELS

Two prominent service models emerged from the data: a specialist model and a professional collaboration model. Eighteen agencies (35.3%) used a specialist model, in which they have specialized deafblind position(s), but counselors from blind and deaf disability areas do not consistently collaborate. Twelve agencies (23.5%) used a professional collaboration model, in which counselors from each disability area collaborate, but the agency does not have specialized deafblind positions. Four agencies (7.8%) used a specialist plus professional collaboration model, in which professionals consistently collaborate *and* the agency has one type of specialized position, a coordinator. The remaining 17 agencies (33.3%) used another type of service model, in which

professionals do not consistently collaborate and the agency does not have specialized positions; we grouped these service models into a miscellaneous category for the purpose of this study. Examples of these miscellaneous service models include having some staff members with training specific to deafblindness, deciding on who provides services (either a counselor for the blind people or a counselor for the deaf people) based on consumer needs or preferences, and relying on contractors to provide services. The number of agencies utilizing each model by agency type is provided in Table 1. The data indicate that service model used does differ by agency type.

Agencies utilizing the specialist model served the largest proportion of consumers who are deafblind—almost half of the consumers despite being utilized by only 35.3% of agencies (see Table 1). Approximately one-third of the agencies utilized a miscellaneous service model, but these agencies only served approximately one-quarter of the population. The percentages of consumers served by the professional collaboration and specialist plus professional collaboration service models were approximately in line with the percentage of agencies that utilized the models.

EFFECTIVENESS OF VOCATIONAL REHABILITATION SERVICE MODELS

Relatively large differences by type of service model were noted in terms of percentage of consumers who exited with competitive employment after receiving services (see Table 1). Agencies utilizing the specialist service model had the highest percentage of competitive employment closures, and agencies utilizing a miscellaneous model had the lowest percentage. The differences in competitive employment closures by service model

Table 1. Percentage of consumers achieving competitive employment outcomes by service model and by agency type \times service model.

Agency type and service model	Agencies utilizing (n)	Consumers closed (n)	Competitive employment (%)
All agencies	51	2,119	53.5
Specialist	18	1,015	59.0
Professional collaboration	12	405	54.6
Specialist + professional collaboration	4	154	50.7
Miscellaneous	17	545	43.3
Blind agencies	24	1,089	61.6
Specialist	11	736	63.6
Professional collaboration	5	215	57.7
Specialist + professional collaboration	1	35	51.4
Miscellaneous	7	103	59.2
Combined agencies	27	1,030	45.0
Specialist	7	279	47.0
Professional collaboration	7	190	51.1
Specialist + professional collaboration	3	119	50.4
Miscellaneous	10	442	39.6

type were statistically significant, $\chi^2(3, N = 2,119) = 35.88, p < .0001, \phi = .13$.

Competitive employment outcomes by service models within each agency type are also presented in Table 1. For combined agencies only, differences in competitive employment closures by service model type were statistically significant, $\chi^2(3, N = 1,030) = 9.88, p = .02, \phi = .10$. However, for blind agencies only, differences in competitive employment closures by service model type were not statistically significant, $\chi^2(3, N = 1,089) = 4.41, p = .22$. Overall, regardless of service model type, blind agencies closed a higher percentage of deafblind consumers with competitive employment.

Multivariate analysis was used to determine whether the significant differences exhibited in competitive employment outcomes based on service models remained when accounting for consumer characteristics. The logistic regression model significantly predicted competitive employment for deafblind consumers, $\chi^2(12, N = 2,119) =$

561.45, $p < .0001$, Nagelkerke $R^2 = .31$ (see Table 2). Service model was a significant predictor, with consumers served by agencies utilizing a miscellaneous service model less likely to achieve competitive employment compared to agencies utilizing either the specialist model or the professional collaboration model. There was not a significant difference in outcomes between miscellaneous service models and the specialist plus professional collaboration model. Agency type was also a significant predictor, with consumers served by blind agencies more likely to achieve competitive employment. The interaction between service model and agency type was tested, but was not significant, and was therefore not retained in the model.

Discussion

The purpose of this study was to describe how agencies are providing services to consumers who are deafblind, including identifying service models that vocational rehabilitation

Table 2. Results of logistic regression analysis predicting competitive employment.

Variable	B	SE	Wald χ^2	p	OR	95% CI
Age	-0.01	.004	8.49	<.01	0.99	[0.98, 1.00]
Female	-0.32	.101	9.90	<.01	0.73	[0.60, 0.89]
Hispanic ethnicity	0.29	.149	3.76	.05	1.34	[1.00, 1.79]
Minority	-0.07	.128	0.28	.60	0.94	[0.73, 1.20]
Education level	0.13	.023	32.35	<.01	1.14	[1.09, 1.19]
SSI	-0.23	.119	3.71	.05	0.80	[0.63, 1.00]
SSDI	-0.13	.109	1.40	.24	0.88	[0.71, 1.09]
Employment at application	2.27	.135	282.30	<.01	9.65	[7.41, 12.57]
Agency type (blind agency)	0.42	.113	13.85	<.01	1.52	[1.22, 1.90]
Service model ^a			8.40	.04		
Specialist	0.34	.137	6.14	.01	1.40	[1.07, 1.83]
Professional collaboration	0.39	.16	6.36	.01	1.48	[1.09, 2.01]
Specialist + professional collaboration	0.36	.209	2.89	.09	1.43	[0.95, 2.15]

Note. $N = 2,119$. OR = odds ratio; SSI = Supplemental Security Income; SSDI = Social Security Disability Insurance; CI = confidence interval.

^aReference group is miscellaneous.

agencies use to serve this population, and to evaluate the effectiveness of the models in terms of competitive employment outcomes. Using interview data from administrators of 51 state vocational rehabilitation agencies, we identified four service models: specialist, professional collaboration, specialist plus professional collaboration, and miscellaneous. Univariate analyses revealed significant differences in competitive employment by service model type for all agencies together and for combined agencies but not for blind agencies. Regardless of service model type, blind agencies closed a higher percentage of deafblind consumers with competitive employment, as found in studies of consumers with visual impairments (e.g., Cavanaugh, 1999; Cavanaugh, Giesen, & Pierce, 2000; Giesen & Cavanaugh, 2013).

Consumers served under the specialist and professional collaboration models were more likely to be competitively employed compared to those served under miscellaneous models, even when controlling for consumer characteristics. This finding supports the

recommendations for specialized personnel made by Watson and colleagues (2008) and the 38th IRI (2015). Specialized personnel understand the diverse characteristics, service needs, culture, and communication preferences of individuals who are deafblind; the specialized knowledge and skills of these professionals are invaluable in supporting deafblind consumers in achieving their employment goals. These results also provide some evidence for the effectiveness of the dual-case approach that has been recommended as a way to provide services to consumers who are deafblind (38th IRI, 2015; Watson et al., 2008).

Agencies with specialized personnel served a larger percentage of consumers who are deafblind compared to agencies utilizing other service models. We do not know whether agencies created these specialized positions due to demand or whether the existence of the positions helped create a demand for the services. Having specialized deafblind personnel may not be feasible for all vocational rehabilitation agencies,

particularly in states with small populations. Although agencies that serve more consumers who are deafblind may perceive a greater need for specialized personnel, having specialized personnel could lead to an increase in both the number of deafblind consumers served and the quality of services. For agencies with specialized positions, recruiting qualified personnel with expertise in deafblindness to fill the positions has historically been an obstacle (Perreault, 1993; Watson et al., 2008). Multiple personnel preparation programs for educational professionals offer coursework or specializations in working with deafblind children (“Teacher Preparation Programs,” 2017); however, there are currently no rehabilitation personnel preparation programs specific to deafblindness in the United States (S. Ruzenski, personal communication, November 28, 2017).

Some administrators described collaboration with external providers or agencies, such as HKNC, as an element of service provision for consumers who are deafblind. Because our interview protocol did not include specific questions or probes related to this topic, we believe our numbers do not capture all of the agencies that work with HKNC and other external providers. Service coordination and interagency collaboration across age groups and systems (e.g., state agencies, educational institutions, and private agencies) have been recommended for individuals who are deafblind (e.g., Watson, 1993; Watson et al., 2008; Wittich, Jarry, Groulx, Southall, & Gagné, 2016; Wolf et al., 1982). Research focusing on collaboration models and service coordination between vocational rehabilitation agencies and external organizations could provide insight into ways in which states can optimize resources to improve services and outcomes for this population.

When accounting for consumer characteristics, consumers served under the specialist,

professional collaboration, and specialist plus professional collaboration models had approximately equal odds of competitive employment (i.e., differences between these three models were not significant). However, those served under the specialist or professional collaboration models had higher odds of competitive employment than those served under miscellaneous models. Consumers served under the specialist plus professional collaboration model were not significantly more likely to achieve competitive employment than those served under miscellaneous models. Variability associated with the small number of consumers served under the specialist plus professional collaboration model may partially explain this finding, as its estimated effect was similar to that of the specialist and professional collaboration models, but the higher standard error resulted in less certainty about the size of the effect.

Miscellaneous service models, the most commonly utilized models among combined agencies, were less effective in terms of competitive employment outcomes based on the regression analysis. Agencies utilizing these models served far fewer consumers per agency than agencies utilizing the other model types, which may at least partially explain why these agencies have limited specialized services for deafblind consumers. It is relevant to note that although blind agencies that utilized a miscellaneous model served few consumers who were deafblind, they achieved a high rate of competitive employment.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

One limitation of the study is that the interview protocol did not include a specific definition of “deafblind,” and administrators could have differed in their interpretations of the population in question. In addition,

despite our efforts to identify distinct service models based on prominent elements of service delivery, some variation and overlap existed within and between the service models. For example, specialized deafblind positions could encompass varying roles and responsibilities; however, we classified them into coordinator and direct service provider positions. Some agencies using the professional collaboration and miscellaneous models have staff members with deafblind training despite not having specialized positions. Furthermore, administrators of 10 blind agencies using the specialist and miscellaneous models reported some degree of collaboration with the general agency but did not identify collaboration as their primary method of serving consumers who are deafblind.

We obtained interview data from blind and combined vocational rehabilitation agency administrators in each state but not general agency administrators. General agencies serve a proportion of consumers who are deafblind, so the absence of data from general agencies is an important limitation to consider when interpreting the results of this study. Because we did not determine service models used by general agencies, we were unable to include deafblind consumers who received services from general agencies in analyses of effectiveness of service models. Future research focusing on vocational rehabilitation service delivery for this population should include information about general agency service delivery. Additional in-depth qualitative analysis would be beneficial to understand how services are being provided in the agencies that achieve high employment success rates for consumers, including those blind agencies utilizing miscellaneous models.

Consumers' perceptions of service model effectiveness and communication strategies used by vocational rehabilitation counselors were beyond the scope of this study. These

topics, as well as the use and role of support service providers in vocational rehabilitation and collaboration with HKNC, are important to consider in future research on service delivery for consumers who are deafblind.

IMPLICATIONS FOR AGENCIES

To improve competitive employment outcomes for individuals who are deafblind, vocational rehabilitation agency administrators can explore options for specialized deafblind positions and promote collaboration within and beyond their agency. In agencies that serve few deafblind consumers, rehabilitation counselors for the deafblind could have an expanded role in which they also serve other populations (i.e., blind or visually impaired, deaf or hard-of-hearing), as described by Watson and colleagues (2008). Designating a statewide deafblind coordinator for all age groups is another option, especially in states with a small deafblind population. To increase the pool of qualified personnel to fill these positions, greater emphasis on personnel preparation in the area of deafblindness for vocational rehabilitation counselors and other providers of adult services is essential. HKNC has a national mandate to train professionals to work with people who are deafblind and offers valuable resources (e.g., seminars, online training modules, internships, community of practice) that agencies can utilize to develop deafblind expertise among their staff members. All personnel who work with this population could benefit from training on the significance of dual-sensory loss, communication methods, and professional collaboration strategies.

Conclusion

The study presented here is the first to provide insight into vocational rehabilitation service provision for deafblind consumers in combined and blind agencies in the United

States and to provide empirical evidence that certain service models are more effective for this population. Results support the value of vocational rehabilitation agencies having specialized deafblind positions or using a professional collaboration model. The specialist plus professional collaboration model, which incorporates both of these characteristics, was not superior to the other models but was similar in terms of competitive employment outcomes. Few agencies utilized the specialist plus professional collaboration model, perhaps because the availability of specialized deafblind personnel may lessen the need for collaboration between professionals with expertise in each separate disability. Combined vocational rehabilitation agencies that utilize miscellaneous service models should evaluate their current service model and consider establishing either the specialist or the professional collaboration model.

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