

Americans with Traumatic Brain Injuries and the Vocational Rehabilitation Process: Strategies for Meeting the Needs of Emerging Consumers

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This article describes the traumatic brain injury (TBI) epidemic that is facing America and its implications for vocational rehabilitation (VR) services. Following an overview of the incidence, prevalence, and impact of TBI, the authors suggest strategies to meet the employment and career development needs of Americans with TBI across the phases of the VR process. The importance of individualized case planning, cognitive support technology, and interface with medical and mental health professionals is emphasized throughout the article. Implications resulting from the ongoing Coronavirus pandemic are discussed.

The tripartite purpose of this article is to (a) describe the nature and needs of Americans with traumatic brain injuries (TBIs), (b) examine the unique effects that TBI has on employment and career development, and (c) suggest strategies that rehabilitation professionals can use to improve vocational rehabilitation (VR) services and outcomes for this growing but underserved clientele. Established best practices in VR services for people with emerging disabilities such as TBI are emphasized throughout the article.

Traumatic Brain Injury

The World Health Organization (WHO, 2020) considers traumatic brain injury (TBI) to be a critical global public health problem. TBI is responsible for approximately one-third of all injury-related deaths worldwide, and it is the number one cause of death and lifelong disability among Americans under the age of 45 (Centers for Disease Control and Prevention [CDC], 2020). The most recent statistics from the CDC (2020) indicate that approximately 2.5 million Americans sustain TBIs annually, and that as many as 5.3 million people in the United States are currently living with the disabling effects of TBI. These incidence and prevalence figures may be underestimates given the fact that the majority (75%) of TBIs are classified as mild (Taylor & Seebeck, 2020) and are often treated outside of hospital settings or not treated at all (American Speech-Language-Hearing Association [ASHA], 2020). Wehman (2017) asserted that some 500,000 of the Americans who acquire TBIs each year receive no medical treatment whatsoever for their injuries.

The Shepherd Center (2020) reported the four most common causes of TBI in the U.S. as falls, motor vehicle accidents, being struck by or against an object, and assaults or abuse. The causes of TBI vary widely according to age. For example, falls disproportionately impact children and older adults, accounting for half of TBI-related emergency room visits by children and 80 percent of visits by adults 65 years of age and older (CDC, 2020). On the other hand, motor vehicle accidents are the leading cause of TBI-related hospitalizations for Americans between the ages of 15 and 44 (CDC, 2020). Recent years have seen particularly sharp increases in the incidence of TBI among children, young adults, and American military personnel (Dillahunt-Aspillaga et al., 2015; Faul, Wald, & Coronado, 2010). The Korey Stringer Institute (2020) reported that more than 1.6 million sports related TBIs occur each year, noting that this figure is also likely to be an underestimate due to underreporting and the tendency for people with mild TBIs to not receive medical treatment.

Rifle and bomb blasts are the leading cause of TBI for active duty military personnel in war zones (Shepherd Center, 2020). According to the Defense and Veterans Brain Injury Center (2020), more than 413,000 United States military service members have received first-time diagnoses of TBI since 2000. Younger people are especially vulnerable to combat-related TBIs; more than two-thirds of American military personnel who have sustained TBIs during the Iraq and Afghanistan conflicts were under the age of 30 at the time of their injuries (Wojcik et al., 2010).

Falvo and Holland (2018) described common physiological symptoms of TBI including fine and gross motor disturbances, spasticity, tremors, diminished strength and stamina, fatigue, sexual dysfunction, chronic pain, and speech dysfluencies. They also described sensory symptoms such as visual and perceptual impairments and hearing loss. Frain, Lee, Roland, and Tschopp (2012) noted that TBI is often characterized by cognitive impairments in such areas as short, intermediate, and long-term memory; attention control and task adherence; executive function; social cognition; analytical abilities; self-management capabilities; and information retrieval. Frain et al. (2012) and Dillahunt-Aspillaga et al. (2017) also noted that people who experience TBIs have elevated risks for depression, anxiety disorders, post-traumatic stress disorder (PTSD), suicidal ideations, and substance use disorders. They are also likely to evince emotional lability, low frustration tolerance, irritability and impatience, hypersexuality (especially males), disinhibited speech and behavior, and feelings of persecution and isolation (Dillahunt-Aspillaga et al., 2017; Falvo & Holland, 2018; Taylor & Seebeck, 2020).

In addition to the physiological, sensory, neurological, cognitive, and psychological effects that stem directly from TBI, people with TBI are at high risk for secondary complications of their injuries in the form of chronic disease. Indeed, some 43% of American TBI survivors experience TBI-related long-term disability, which can include hypertension, diabetes, obesity, dementia, stroke, and other related conditions (Cetty et al., 2017). An examination of disability patterns among people with TBI by Yi et al. (2018) revealed that having a history of a TBI with a loss of consciousness significantly increases one's lifetime risk of having any type, each type, or a greater number of disabling chronic diseases. For example, in their study, Dreer et al. (2018) found that a majority of individuals with TBI who

required acute rehabilitation had excess weight gain and associated chronic disorders including hypertension and diabetes. Factors that have been shown to impact the long-term health outlook for survivors of TBI include level of mobility impairment, severity of cognitive impairment, smoking, level of education, access to healthcare, employment status, financial resources, stress levels, and diet/nutrition (Cetty et al., 2017; Dreer et al., 2018; Jourdan et al., 2012).

With its role as a conduit to health insurance and therefore healthcare, community participation, financial resources, and overall quality of life, employment is an important factor in the long-term health of Americans with TBI (Dillahunt-Aspillaga et al., 2017; Wehman, 2017). Unfortunately, it has been reported that 75% of individuals with TBI who return to work after injury lose their jobs within 90 days if they do not have adequate job retention supports such as assistive technology and other reasonable accommodations (National Association of State Head Injury Administrators, 2006). Frain and colleagues (2012) estimated the rate of labor force participation among working-age Americans with moderate and severe TBIs to be less than 40 percent.

For the growing numbers of young people with TBIs, their injuries occur during critically important developmental periods when they are attempting to acquire training and make initial career choices (Wehman, 2013). For veterans with TBI, these complications arise when they need to refresh their employment skills and re-enter civilian life. In fact, Dillahunt-Aspillaga et al. (2017) reported that employment-related issues were the number one concern for military personnel who had recently acquired TBIs.

Higher education has long been viewed as a career equalizer for disadvantaged individuals. This is especially important in light of the well-documented positive influences that advanced education and economic self-sufficiency have on mental health, physical health, and life expectancies among people with and without disabilities (Strauser, 2014; Wehman, 2017). However, postsecondary students with TBIs, many of whom are young adults or returning combat veterans in the midst of other life transitions, face numerous academic and career preparatory challenges related to their cognitive, psychosocial, and overall health problems. The aggregate of these challenges results in lower grades in college and higher dropout rates compared to those reported by non-disabled students (Todis, Glang, Bullis, Ettl, & Hood, 2011). Among the most prominent concerns reported by college students with TBIs are (a) limited access to assistive technology to compensate for cognitive limitations, (b) unawareness of community mental health and medical resources, (c) managing TBI symptoms and overall health, and (d) the limited availability of career preparatory services (Hendricks et al., 2015).

The reciprocal impact of the personal, social, educational, vocational, and environmental implications of TBI appears to lead to a higher incidence of long-term health-related consequences and premature death for survivors of TBI. Weight gain and poor health maintenance can stem from direct effects of TBI such as issues in executive functioning that lead to deficits in abilities to manage health-related conditions like diabetes and psychiatric comorbidities (e.g., depression, anxiety, PTSD). These conditions, in turn, can lead to

sedentary lifestyles, social isolation, substance abuse, poor immune health, and lower academic and vocational achievement.

Americans with TBI constitute a vulnerable and vastly underserved consumer population that is often in dire need of quality healthcare, mental health, and VR services. These individuals stand to benefit from the same VR services as those provided to people with other disabilities. However, they often experience barriers (e.g., mixed messages received from physicians regarding their capacity to work, lack of identification as persons with disabilities, unawareness of the availability of services, lack of knowledge on the part of VR professionals regarding the medical and vocational aspects of their conditions, exclusionary eligibility criteria) to accessing and receiving VR services that could improve their employment outcomes. Troublingly, less than one-third of Americans with TBIs have ever heard of the state-Federal VR program, and less than five percent take part in that program (Hendricks et al., 2015). Moreover, Rubin, Roessler, and Rumrill (2016) reported that less than half of state-Federal VR clients with TBIs nationwide are competitively employed at the end of their VR programs.

It should be of little surprise that people with TBI are worried about their long-term employment prospects. Surveys of this growing population repeatedly document concerns related to enrolling in and completing formal training, workplace discrimination, the risks and benefits of employment, home-based employment, legal protections and employment-related resources, health insurance coverage and access to quality health care, the availability of assistive technology in the workplace (especially technology to help people compensate for cognitive impairments), and self-advocacy strategies to aid in employment and community participation (Hendricks et al., 2015; Koch & Rumrill, 2017).

Strategies for Supporting People with TBI across Phases of the VR Process

Rehabilitation counselors must remain current regarding the constantly changing needs of consumers with TBI. They should have a basic understanding of common causes, symptoms, and effects of TBI before meeting with consumers for the first time. In qualitative research with individuals with emerging disabilities including TBI, participants have consistently reported frustration with having to educate service providers about their conditions (Koch & Rumrill, 2017). Having some basic knowledge while also being honest about what the rehabilitation counselor does not know and being open to ongoing education is extremely important in providing services to individuals with TBI and other severe disabilities. Adopting these postures will enhance the rehabilitation counselor-consumer relationship, and it can also improve employment outcomes and career pathways for people with TBI.

Because of the multi-systemic effects of TBI, VR planning in both the private and public sectors is likely to be a complex process that ideally includes an interdisciplinary team and a combination of medical and vocational supports such as early intervention, psychosocial support, independent living services, proactive planning to prepare for future changes in functioning, and post-employment services. In this section, we examine specific strategies

that can be implemented at each phase of the rehabilitation process to improve services to individuals with TBI.

Outreach, Screening, and Eligibility Determination

Though rapidly growing in number, people with TBIs are a vastly underserved consumer population. There are a variety of individual, environmental, and systems barriers (e.g., unawareness of cognitive support technology options, limited access to transportation, lack of awareness of the availability of rehabilitation services, exclusionary eligibility criteria, stigma and lack of understanding on the part of service providers, policies and procedures that are nonresponsive to the long-term and changing needs of people with TBI) that could account for their underrepresentation in the VR system (Koch & Rumrill, 2017). Medical and health care professionals may give people mixed messages regarding their capacity to enter or continue employment and are often unaware of the availability of VR services. Therefore, education and outreach efforts should target both individuals with TBI and their medical and health care providers. Physicians and other health care providers need accurate information about the benefits of work, assistive technology, reasonable accommodations, and the role of rehabilitation professionals in promoting long-term vocational success (Koch, Rumrill, & Conyers, 2012). In particular, outreach and education should target the medical specialists who treat individuals with TBI (e.g., neurologists, physiatrists, physical therapists, occupational therapists, speech and language pathologists, psychiatrists, neurosurgeons). Awareness of and access to VR services can also be improved by decentralizing VR services and stationing VR specialists in settings where individuals with TBI receive health, medical, and social services (e.g., pain clinics, public health agencies, mental health agencies, physicians' offices, VA medical centers, rehabilitation hospitals).

Because many individuals with TBIs do not identify themselves as persons with disabilities (Koch & Rumrill, 2017), they are unlikely to view rehabilitation programs and agencies as potential resources. Therefore, it may be necessary to use language such as "people with brain injuries" in replacement of or in addition to "people with disabilities" in marketing materials, outreach efforts, intake interviews, and eligibility criteria (Fujiura, 2001).

Additionally, it has been estimated that 70-90% of TBIs are mild (Lingsma et al., 2015). For most individuals with mild TBIs, symptoms will dissipate. However, 5-15% of individuals with mild TBIs will have ongoing physical, behavioral, and/or cognitive problems three to six months after their injuries that can impair their ability to perform activities of daily living, schoolwork, and/or job duties (Lingsma et al., 2015). The more subtle functional and cognitive difficulties associated with mild TBI often go undetected or do not become apparent until long after the injury has occurred (Traumatic Brain Injury, 2019). In such cases, clients may express frustration at work, in school, and at home without knowing the source of their frustration. They may not attribute their difficulties with these activities to having experienced TBI. In such cases, the rehabilitation professional may want to consider asking specific questions about whether or not the individual received any kind of trauma to the head and if she or he is having any of the symptoms of TBI. Then, appropriate referrals for further evaluation may be indicated.

Rehabilitation professionals often make medical referrals to establish program eligibility, but it is critical that they do some research to identify medical professionals in the community who are most knowledgeable about the consumer's TBI to ensure a comprehensive assessment. Here we remind readers that as many as 500,000 Americans sustain TBIs each year without ever receiving medical treatment (CDC, 2016; Wehman, 2017). Making appropriate referrals is imperative so that duplicative and unnecessary tests and procedures that only exacerbate stress, further undermine the applicant's health, and extend the time from eligibility determination to plan development are avoided. In some cases, the applicant is already being treated by appropriate specialists who can expedite the eligibility determination process by providing the necessary documentation. For those who are not being treated or who are receiving inadequate treatment, it is important to expedite eligibility determination by gathering enough information to establish eligibility first and then continue with referring individuals for additional assessments because the evaluation process may take a substantial amount of time.

Assessment and Planning

Assessment and planning with people with TBI must be approached as an interdisciplinary venture, one requiring a collaborative team of medical, health care, mental health, and rehabilitation experts. The complex, multi-systemic nature of TBI necessitates flexibility in sequencing rehabilitation service delivery so that the assessment phase can be recycled in response to changes and fluctuations in the individual's health status and functional abilities. In assessing the client's service needs, rehabilitation professionals must be cautious not to use instruments that could be biased against individuals with TBI. They must also take into account factors related to the administration of the assessment. For example, a test of cognitive ability could be compromised if the examinee is experiencing TBI-related fatigue during the assessment. Accommodations should be considered that provide the most accurate representation of the client's skills, abilities, attitudes, and values.

Neuropsychological evaluations can provide valuable data to inform VR planning. These are conducted by either neuropsychologists or rehabilitation psychologists and may be indicated if the individual has never been evaluated or if a substantial amount of time has passed since he or she was evaluated. The Neuropsychology Division of the American Psychological Association (APA, 2020) provides a description of what is involved in a neuropsychological evaluation. In neuropsychological evaluations, clinicians collect relevant historical information about the examinee in a clinical interview and from the results of a battery of standardized tests that is integrated into a report that is provided to the referral source.

The neuropsychological clinician reviews medical and other records as well, and, with consent of the consumer, family members or other knowledgeable persons may be interviewed and asked to share their perspectives on the consumer's history and symptoms (APA, 2020). Standardized tests include the use of oral questions, paper and pencil tests, computers, manipulation of objects such as blocks and puzzles, and other procedures. Testing examines a wide range of cognitive abilities and limitations (e.g., attention, memory, language, academic skills, reasoning, problem solving, visuospatial

ability, sensory-motor skills). The clinician may also evaluate the consumer's mood, emotional style, behavior, and personality. The information obtained from neuropsychological evaluations provides a comprehensive snapshot of the examinee's abilities and limitations as well as strategies to ameliorate limitations and improve functioning. This information will be especially informative if the VR counselor asks specific referral questions that can be addressed in the evaluation. Likewise, it is helpful for the neuropsychologist to interpret the evaluation to both the consumer and the VR counselor so that both understand the functional strengths and limitations of the consumer as well as potential services to include in the rehabilitation plan.

In identifying employment goals, educating consumers about reasonable accommodations and assistive technology, especially cognitive support technology (Rumrill et al., 2019), will expand their perceived career options. Transferable skills analyses, particularly for those consumers who acquire mid-career TBIs, can further inform the goal-setting process. In guiding people with TBI in establishing vocational goals, VR professionals should include consideration of occupations that allow employees to maintain flexible work schedules as well as the ability to work from home. Physical restoration services (e.g., pain management, physical therapy, medications, follow-up appointments with medical and health care specialists) are likely to be necessary if individuals are to achieve the intermediate objectives (e.g., participate in and successfully complete training programs) that are indicated in the rehabilitation plan. Both standard and complementary therapies such as acupuncture, chiropractics, and massage therapy may be indicated. Psychological support services to (a) deal with the stress and stigma associated with TBI, (b) facilitate development of pain coping skills and generalization of these skills to employment settings and job tasks, and (c) treat secondary mental health conditions may be necessary, as well.

Counseling and Guidance

Most importantly, when counseling individuals with TBI, practitioners should take caution not to underestimate the abilities of these individuals. With the support of assistive technology and reasonable accommodations, opportunities for education and employment substantially increase. Relatedly, Smart (2009) indicated that the ambiguity of disability often creates a sense of discomfort among others because of a fear of the unknown and an inability to understand the appropriate social dynamic or way of interacting with the person. Furthermore, people (including rehabilitation professionals) may have the tendency to ascribe negative attributes or greater limitations to people with disabilities such as TBIs that are ambiguous. The ambiguity of TBIs can be heightened by the fact that they are often invisible, and their effects vary among and even within individuals (Falvo & Holland, 2018).

In providing counseling and guidance to individuals with TBI, VR professionals need to reassure these consumers that their range of emotional responses are "normal" for their circumstances and commonly experienced by others coping with medical uncertainties (Smart, 2009). Those with mild TBIs are likely to be more aware of changes in cognitive functioning than those with moderate to severe TBIs; therefore, counseling and guidance may be especially indicated for these individuals who may experience a sense of loss and compare their pre-injury functioning to their post-injury functioning. (Dillahunt-Aspillaga

et al., 2017). Many people with TBIs do not realize that others are going through similar responses and challenges. Rehabilitation professionals can provide information regarding adjustment to disability and explore referrals to appropriate support groups and self-help literature to help clients put their personal experiences into perspective and reduce feelings of isolation and alienation. Counseling sessions and support groups can focus on a number of different topics including: (a) adjustment to disability issues, (b) coping with lack of support or understanding from others, (c) coping with loss of bodily functions and associated loss in self-esteem, (d) grief issues, (e) avoiding helplessness, hopelessness, and victimization, (f) impact of TBI on interpersonal relationships, (g) employment issues, (h) cognitive functioning, (i) sexuality, and (j) health promotion and prevention of secondary complications.

Postsecondary Education and Training

An important component of rehabilitation plans for many individuals with TBI should be postsecondary education that spans from training in a particular trade to obtaining a bachelor's or advanced degree. Participation in postsecondary education can increase the likelihood of moving out of poverty and obtaining employment that provides livable wages and crucial health care benefits. VR professionals must work with consumers with TBI to evaluate their abilities, interests, and potential limitations regarding postsecondary training, including the need for classroom accommodations and cognitive support technology (CST).

Common functional limitations associated with TBI that can create challenges to successful participation in college include Impairments in memory, attention, concentration, word finding, and visual perception; difficulties with reading, arithmetic, reasoning, vocabulary, writing, and spelling; trouble mastering new information and applying this information to novel situations; unpredictable periods of improvement and setbacks, medical complications such as chronic disease (e.g., diabetes, hypertension, substance abuse); medication side effects; and the presence of physical, sensory and/or motor deficits (Hux et al., 2010; Kreutzer & Hsu, 2011). Students with TBI may also experience physical, social, and emotional impairments that, combined with other symptoms, are likely to affect not only their academic performance but also social relationships (Hux et al., 2010).

The multitude of cognitive challenges associated with TBI may be unfamiliar to many trainers and college instructors, so outreach and technical assistance to faculty members may be necessary to correct misperceptions and ensure that students with TBI are provided the classroom accommodations they need. Hux et al. (2010) also underscored how important it is for individuals with TBI to recognize their learning strengths and challenges and achieve a level of independence in identifying, developing, implementing, and modifying compensatory strategies and accommodations (especially CST) to achieve academic success. When working with individuals to assist them in developing classroom accommodation plans, it is empowering to first ask them what compensatory strategies and accommodations they are already using, help them translate these into classroom accommodations, and then work together to identify additional accommodations that may be needed. The accommodations that can be provided to students with TBI are extensive. Examples include memory books or planners; cognitive enhancement software and tablet

computer or smart phone applications or 'apps;' visual learning materials to supplement lectures (e.g. handouts, pictures, diagrams); audio recordings of textbooks; notetakers; course substitutions; extended time for completing tests or assignments; priority registration; and testing in a distraction-free environment. Accommodation plans must also be periodically reviewed and adjusted to specific course requirements.

With effective accommodations, postsecondary students with TBI have abundant achievement potential. Rumrill et al. (2019) reported the outcomes of Project Career, a five-year initiative that served college students with TBIs by providing training in CST in the form of iPads and apps and career preparatory services to promote academic and employment success. The 150 students who took part in the project had a 91% retention rate in their degree programs. Their average GPA was 2.65 at the time they enrolled and 3.25 when they exited. Of the 41 students who graduated from their degree programs during the project, 98% were competitively employed or attending graduate school at a 12-month follow-up.

Job Development and Placement

In exploring employment options, rehabilitation and job placement professionals must first explore quality of life issues with individuals with TBIs because these can have a huge bearing on their willingness and capacity to work. The symptoms of many TBIs (e.g., chronic pain, mobility limitations, severe fatigue) may make it difficult for these individuals to participate in any activities other than employment. As a result, their ability to carry out activities of daily living may be severely compromised. Likewise, they may have no energy left after work or on weekends to socialize with family and friends or to participate in leisure activities that they enjoy. In these instances, it may be pertinent to explore options other than employment such as applying for long-term disability benefits offered by employers or Social Security Disability Insurance. Other individuals may be so isolated that employment can improve their quality of life by providing opportunities to socialize with co-workers and increase their sense of purpose and self-worth. Additionally, job development and placement may also require consideration of home modifications to increase the likelihood of employment satisfaction and satisfactoriness. This may be especially true in the foreseeable future as society moves through the aftermath of the Coronavirus pandemic and many workers will be required to work from home.

For job seekers with TBIs, barriers to employment may occur in five areas: accessibility of the worksite (both physical and attitudinal), performance of essential functions and requirements of the job, relationships with employers and co-workers, employment policies, and necessary work supports. Although traditional approaches to job placement and accommodation planning target each of these areas, concepts such as accessibility, reasonable accommodations, and universal design take on new meaning for workers with TBI. In targeting employment opportunities, the client and placement specialist need to consider invisible barriers (e.g., discriminatory behaviors of co-workers, workplace incivility) as well as those that are readily apparent. It is also important to consider telecommuting, home-based employment opportunities, and social distancing

requirements that will shape the American economy for many years to come in the wake of the Coronavirus pandemic.

Because individuals with TBIs often do not perceive themselves as people with disabilities, they may not be aware of their legal rights under Title I of the Americans with Disabilities Act (ADA) or procedures by which to invoke their rights. These individuals may be in need of specific information and assistance regarding such processes of ADA implementation as requesting reasonable accommodations, documenting their disability status, and making formal complaints of employer discrimination. The emphasis of all ADA-related training should focus on helping people to invoke their legal rights to non-discriminatory treatment in the workplace while maintaining non-adversarial relationships with employers and co-workers.

Even when equipped with an accurate understanding of the provisions of the ADA, however, individuals with TBI may be hesitant to invoke their rights because of prior unsuccessful experiences with attempting to do so. It has been well documented that employer responses to requests for worksite accommodations from these individuals are often negative, ranging from denial of the request to outright hostility and harassment (Hendricks et al., 2015). Complicated issues related to disclosure of disability, accommodation requests, workplace climate, and co-worker relationships will need to be explored in-depth and revisited throughout the job search process. The risks and benefits of disclosure must be weighed, and careful consideration must be given to the content and timing of disclosures as well as to whom to disclose.

Assistance to employers in implementing reasonable accommodations is another critical component of the job development and placement process. The process of identifying appropriate workplace accommodations is complicated by the multiple effects of TBI and the presence of cognitive impairments. The job placement specialist is uniquely positioned to guide the employee and employer in addressing concerns such as job performance, reactions of co-workers, absenteeism, and reasonable accommodations. Employers also may need to be educated about the low cost and ease of most accommodations (e.g., flex-time, flex-place, telecommuting, natural supports) for workers with disabilities in general and for people with TBI in particular. The Job Accommodation Network (JAN) is a useful resource for exploring possible accommodations for individuals with TBIs.

In fact, JAN features a TBI-specific portal called the Students, Technology, Accommodations, and Resources (STAR) network that serves as a vehicle for electronic information and technical assistance related to postsecondary education and employment for people with TBIs (Rumrill et al., 2019). The STAR network provides TBI-related information regarding assistive technology supports and resources for postsecondary students and employees with TBI, college and university personnel, rehabilitation professionals, occupational therapists, employers, and other stakeholders. The site features multiple filters that may be applied by users to target their most immediate needs. The site receives approximately 15,000 hits per month. Visit the STAR portal at <http://www.projectcareertbi.org/>

Job Retention, Follow-Up, and Return-to Work Services

The high rate of disengagement from the workforce after TBI underscores the need to prioritize job retention services and follow along supports beyond 90 days after initial placement. Many individuals are successfully employed with solid work histories when they acquire TBIs, and the provision of employment supports in a preventative, early intervention context reduces the likelihood of premature departure from the workforce and precludes the negative consequences of unemployment (e.g., financial difficulties, psychological distress, worsening of symptoms, secondary health problems; Strauser, 2014).

Regular monitoring of changes in one's health status, performance of job tasks, and accommodation needs is often required if these individuals are to maintain employment and advance in their careers. Immediate changes to the work environment through proactive accommodation planning can enable individuals to continue working for indefinite periods of time. Again, however, because employers are often reluctant to provide accommodations to individuals with TBI (and especially so for accommodations that address cognitive limitations), rehabilitation professionals must take on strong advocacy roles to garner their cooperation in implementing necessary changes. There is no clear-cut successful formula for helping people who acquire TBIs in mid-career to return to work. However, employers who are supportive and willing to modify the work environment contribute to increased success in return to work plans (Saeki, 2000; Kwan & Schultz, 2018). Thus, it behooves rehabilitation counselors and placement specialists to assess the organizational culture of potential placement sites. Because individuals with TBIs have far too often experienced negative reactions from others in response to their conditions, it is crucial to their success that they work in inclusive work settings that value diversity and have a strong history of hiring and promoting individuals with disabilities. Taking advantage of volunteer and part-time work opportunities and gradually transitioning to full-time work can be a helpful strategy, and the benefits of long-term part-time work or even volunteer activities should not be overlooked in helping people re-establish a sense of purpose and psychosocial well-being (Conroy, Milani, Levine, & Stein, 2009). Developing and implementing creative job accommodation strategies or changing positions to less cognitively demanding roles may be particularly helpful. Finally, because TBI often compromises one's ability to drive, transportation to and from work and for required on-the-job travel is often an important return-to-work issue.

Conclusion

TBI is a major public health concern in the United States and worldwide, and people with TBI are a growing yet underserved clientele for rehabilitation professionals. With that in mind, this article has presented considerations for providing responsive VR services to individuals with TBI across the phases of the VR process. We provide a summary of these considerations and recommendations in Table 1. Each of the sequential phases of the VR process (i.e., outreach, eligibility determination, assessment, case planning, counseling and guidance, training, job development and placement, accommodation planning, post-employment and job retention follow-up; Roessler, Rubin, and Rumrill, 2018) requires careful examination of the medical, psychosocial, career development, and community living issues that inhere to the TBI experience. We hope that our discussion of these issues

in this article has provided some insight into the growing population of Americans with TBI and how VR services can be adapted to optimally respond to the expressed needs of these individuals.

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References

- American Speech-Language-Hearing Association. ASHA. (2020). Traumatic brain injury in adults. Retrieved from https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589935337§ion=Incidence_and_Prevalence#General_Statistics
- American Psychological Association (2020). Clinical Neuropsychology. <https://www.apa.org/ed/graduate/specialize/neuropsychology>
- Cetty, L., Abdin, E., Vaingankar, J. A., Jeyagurunathan, A., Chua, B. Y., Picco, L., ...Subramaniam, M. (2017). Prevalence and correlates of traumatic brain injury (TBI) in older adults: Results from the Well-being of the Singapore Elderly (WiSE) study. *International Psychogeriatrics*, 29(11), 1899–1907. <https://doi-org.proxy.library.kent.edu/10.1017/S104161021700134X>
- Conroy, B. E., Milani, F., Levine, M., Stein, J. (2009). Vocational rehabilitation after a stroke. In J. Stein, R. L. Harvey, R. Macko, C. Winstein, & R. Zorowitz (Eds.), *Stroke recovery and rehabilitation* (pp. 735-746). New York, NY: Demos Medical Publishing.
- Dillahunt-Aspillaga, C., Nakase-Richardson, R., Hart, T., Powell-Cope, G., Dreer, L. E., Eapen, B. C. ... & Silva, M. A. (2017). Predictors of employment outcomes in veterans with traumatic brain injury: A VA traumatic brain injury model systems study. *Journal of Head Trauma Rehabilitation*, 32(4), 271-282.
- Dillahunt-Aspillaga, C., Smith, T. J., Hanson, A., Ehlke, S., Stergiou-Kita, M., Dixon, C. G., & Quichocho, D. (2015). Exploring vocational evaluation practices following traumatic brain injury. *Behavioural Neurology*, 2015, Article 924027, 11 pages. Retrieved from <http://dx.doi.org/10.1155/2015/924027>
- Dreer, L.E., Ketchum, J.M., Novack, T.A., Bogner, J., Felix, E.R., Corrigan, J.D., ... Hammond, F.M. (2018). Obesity and overweight problems among individuals 1 to 25 years following acute rehabilitation for traumatic brain injury: a NIDILRR traumatic brain injury model systems study. *Journal of Head Trauma Rehabilitation.*, 33(4):246–56.
- Falvo, D. R., & Holland, B. E. (2018). *Medical and psychosocial aspects of chronic illness and disability* (6th ed.). Burlington, MA: Jones and Bartlett Publishers.
- Faul, M., Xu, L., Wald, M. M. and Coronado, V. G. (2010) *Traumatic brain injury in the United States: Emergency department visits, hospitalizations and deaths 2002-2006*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- Frain, M. P., Lee, J., Roland, M., & Tschopp, M. K. (2012) A rehabilitation counselor integration into the successful rehabilitation of veterans with disabilities. In P. J. Toriello,

M. L. Bishop, & P. D. Rumrill (Eds.), *New directions in rehabilitation counseling: Creative responses to professional, clinical, and educational challenges* (pp.255-281). Linn Creek, MO: Aspen Professional Services.

Fujiura, G. T. (2001). Emerging trends in disability. *Population Today*, 29(6), 9-10.

Hendricks, D. J., Sampson, E., Rumrill, P., Leopold, A., Elias, E., Jacobs, K. ... & Stauffer, C. (2015). Activities and interim outcomes of a multi-site development project to promote cognitive support technology use and employment success among postsecondary students with traumatic brain injuries. *Neurorehabilitation*, 37, 449-458.

Hux, K., Bush, E., Zickefoose, S., Holmberg, M., Henderson, A., & Simanek, G. (2010). Exploring the study skills and accommodations used by college student survivors of traumatic brain injury. *Brain Injury*, 24(1), 13-26.

Jourdan, C., Brugel, D., Hubeaux, K., Toure, H., Laurent-Vannier, A., & Chevignard, M. (2012). Weight gain after childhood traumatic brain injury: a matter of concern. *Developmental Medicine & Child Neurology*, 54(7), 624-628.

Koch, L., & Rumrill, P. (2017). *Rehabilitation counseling and emerging disabilities: Medical, psychosocial, and vocational aspects*. New York, NY: Springer Publishing Company.

Koch, L. C., Rumrill, P. D., & Conyers, L. M. (2012). The nature and needs of people with emerging disabilities. In M. Bishop, P. Toriello, & P. Rumrill (Eds.), *New directions in rehabilitation counseling: Creative responses to professional, clinical, and educational challenges* (pp. 115-139). Springfield, IL: Charles C. Thomas.

Korey Stringer Institute. (2020). *Traumatic brain injury*. University of Connecticut. Retrieved from <https://ksi.uconn.edu/emergency-conditions/traumatic-brain-injury/#>

Kreutzer, J. & Hsu, N. (2011) *Accommodations Guide for Students with Brain Injury* <https://www.brainline.org/article/accommodations-guide-students-brain-injury>

Kwan, H. C., & Schultz, I. Z. (2018). Work accommodations: A social perspective. In R. J. Gatchel, I. Z. Schultz, & C. T. Ray (Eds.), *Handbook of rehabilitation in older adults* (pp. 271-288). New York, NY: Springer Publishing Company.

Lingsma, H. F., Yue, J. K., Maas, A. I., Steyerberg, E. W., Manley, G. T., & Mukherjee, P. (2015). Outcome prediction after mild and complicated mild traumatic brain injury: external validation of existing models and identification of new predictors using the TRACK-TBI pilot study. *Journal of Neurotrauma*, 32(2), 83-94.

National Association of State Head Injury Administrators. (2006). *Traumatic brain injury facts: Vocational rehabilitation and employment services*. Alabaster, AL: Author.

Roessler, R., Rubin, S., & Rumrill, P. (2018). *Case management and rehabilitation counseling: Procedures and techniques* (5th ed.). Austin, TX: Pro-Ed.

Rubin, S., Roessler, R., & Rumrill, P. (2016). *Foundations of the vocational rehabilitation process* (7th ed.). Austin, TX: Pro-Ed.

Rumrill, P., Hendricks, D.J., Elias, E., Jacobs, K., Leopold, A., Minton, D. ... & Taylor, A. (2019). An organizational case study of a five-year development project to promote cognitive support technology use, academic success, and competitive employment among civilian and veteran college students with traumatic brain injuries. *Journal of Applied Rehabilitation Counseling*, 50(1), 57-72.

Saeki, S. (2000). Disability management after stroke: Its medical aspects for workplace accommodation. *Disability & Rehabilitation*, 22(13), 578-582.

doi:10.1080/09638280050138241

Shepherd Center. (2020). Common causes for brain injury. Retrieved March 1, 2020 from <https://www.shepherd.org/patient-programs/brain-injury/about/causes>

Smart, J. (2009). *Disability, society, and the individual* (2nd ed.). Austin, TX: Pro-Ed.

Strauser, D. (2014). Introduction to the centrality of work. In D. R. Strauser (Ed.), *In Career development, employment and disability in rehabilitation: From theory to practice* (pp.1-10). New York, NY: Springer Publishing Company.

Taylor, J., & Seebeck, R. (2020). Preinjury psychological factors and case formulation in mild traumatic brain injury rehabilitation: A case report. *Rehabilitation Counseling Bulletin*, 63(3), 156-167.

Traumatic Brain Injury (2019). Mild TBI Symptoms <https://www.traumaticbraininjury.com/mild-tbi-symptoms/>

Todis, B., Glang, A., Bullis, M., Ettel, D., & Hood, D. (2011). Longitudinal investigation of the post-high school transition experiences of adolescents with traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 26(2), 138-149.

U.S. Department of Defense, Defense and Veterans Brain Injury Center. (2020). DoD worldwide numbers for tbi. Retrieved March 3, 2020 from <http://dvbic.dcoe.mil/dod-worldwide-numbers-tbi>

U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Injury Prevention and Control and Prevention. (2020). Traumatic Brain Injury & Concussion. Retrieved March 7, 2020 from <https://www.cdc.gov/traumaticbraininjury/data/rates.html>

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. (2016). Traumatic brain injury & concussion. Retrieved September 20, 2016 from <https://www.cdc.gov/traumaticbraininjury/data/rates.html>

Wehman, P. (2017, May). Transitional polytrauma rehabilitation: Community competence, inclusion, and integration. Keynote Address presented at the National VA Polytrauma Conference. Orlando, FL.

Wehman, P. (2013). *Life beyond the classroom* (5th ed.). Baltimore, MD: Paul Brookes.

Wojcik, B. E., Stein, C. R., Bagg, K., Humphrey, R. J., & Orosco, J. (2010). Traumatic brain injury hospitalizations of U. S. army soldiers deployed to Afghanistan and Iraq. *American Journal of Preventive Medicine*, 38(1S), S108 –S116.

World Health Organization. (2020). Neurological Disorders: Public Health Challenges. Retrieved March 1, 2020 from http://www.who.int/mental_health/publications/neurological_disorders_ph_challenges/en

Yi, H., Corrigan, J. D., Singichetti, B., Bogner, J. A., Manchester, K., Guo, J., & Yang, J. (2018). Lifetime history of traumatic brain injury and current disability among Ohio adults. *The Journal of Head Trauma Rehabilitation*, 33(4), E24–E32.

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