Work 58 (2017) 3–14
DOI:10.3233/WOR-162601
IOS Press

Qualitative case studies of professional-level workers with traumatic brain injuries: A contextual approach to job accommodation and retention

Richard T. Roessler[a], Phillip D. Rumrill, Jr[b,*], Stuart P. Rumrill[c], Deborah L. Minton[b], Deborah J. Hendricks[d], Elaine Sampson[d], Callista Stauffer[b], Marcia J. Scherer[e], Amanda Nardone[f], Anne Leopold[g], Karen Jacobs[f] and Eileen Elias[g]
[a]*Rehabilitation Consultant, Fayetteville, AR, USA*
[b]*Kent State University, Kent, OH, USA*
[c]*University of Arkansas, Fayetteville, AR, USA*
[d]*West Virginia University, Morgantown, WV, USA*
[e]*University of Rochester, Rochester, NY, USA*
[f]*Boston University, Boston, MA, USA*
[g]*JBS International, North Bethesda, MD, USA*

Received 14 July 2017
Accepted 26 July 2017

Abstract.
BACKGROUND: Traumatic brain injury (TBI) is a multi-systemic disability that causes a wide range of difficulties with personal and social functioning.
METHODS: Four individuals with TBI participated in an evaluation of barriers to their continued employment following graduation from college. A trained interviewer completed the Work Experience Survey (WES) in teleconsultation sessions with each participant.
RESULTS: Researchers applied a qualitative case study research design. Participants reported a wide range of difficulties in performing essential functions of their jobs (3 to 24) that have the potential to significantly affect their productivity. Career mastery problems reflected outcomes associated with TBI such as 'believing that others think I do a good job' and 'having the resources (e.g., knowledge, tools, supplies, and equipment) needed to do the job.' Indicative of their wish to continue their current employment, participants reported high levels of job satisfaction.
CONCLUSIONS: The WES is a cost-effective needs assessment tool to aid health and rehabilitation professionals in providing on-the-job supports to workers with TBI.

Keywords: Traumatic brain injury, workplace accommodations, needs assessment, job retention

1. Introduction

Traumatic brain injury (TBI) produces multiple cognitive, emotional, psychosocial, and physical symptoms [1, 2] that can have far ranging negative effects such as loss of a personal sense of identity,

*Address for correspondence: Phillip Rumrill, Ph.D., CRC, Kent State University, Center for Disability Studies, 413 White Hall, P.O. Box 5190, Kent, OH 44242-0001, USA. Tel.: +1 330 672 0600; Fax: +1 330 672 2512; E-mail: prumrill@kent.edu.

contracted view of self and the future, unemployment, and deterioration in quality of life [3]. Given the fact that the incidence of TBI, as measured by emergency room visits, has increased significantly over the past decade [4], and considering the deleterious impact that TBI has on an individual's prospects for desirable life outcomes, the need to provide comprehensive and timely post-injury rehabilitation services is critical.

The purpose of this article is to describe a service designed to improve the job retention outcomes of adults with TBI. The intervention combines: (a) an assessment of areas of incompatibility between worker abilities and job demands and (b) development of a job accommodation plan to increase worker productivity [5, 6]. As Muenchberger et al. [3] noted, without rehabilitation interventions, adults with TBI are easily overcome by the unpredictability of their symptoms and the ensuing self-doubt that is one of the primary reasons for their high post-injury unemployment rates.

1.1. TBI's impact on personal functioning and job retention

The potential for a lack of fit between a person and a job is obvious in any review of TBI symptoms, which include cognitive difficulties (e.g., memory, reading, listening, organizing, and reasoning difficulties), emotional issues (e.g., problems with depression, anger management, and anxiety), physical effects (e.g., headaches, speech problems, lack of coordination, and fatigue), and psychosocial problems (e.g., feeling misunderstood, being bullied or teased, and being perceived by others as malingering or not performing consistent with capabilities [2, 5, 7]. Most people with TBI are employed at the time of their injuries, but only 31 percent are employed one year later [8]. For individuals with TBI to make a successful post-injury transition into (or back into) the worker role, they require periodic monitoring of the extent to which TBI symptoms are disrupting worker/job congruence as described in the Minnesota Theory of Work Adjustment [6]. Muenchberger et al. [3] described this resumption of the worker role as a struggle to maintain a tentative balance between person and environment that requires adaptation on the part of the person and the job (i.e., job accommodation or modification).

Other researchers have emphasized the importance of viewing outcomes of any transition into life roles following TBI from this person-in-environment holistic or contextual perspective [9–11]. They advocated assessing the requirements of contexts in which the person with a TBI participates to identify mismatches between personal skills and task demands that threaten role retention. Research suggests the need for just such an assessment of the extent of fit between adults with TBI and work role demands given the high post-injury unemployment rates of people with TBI [12]. In one study of adults with TBI, Coetzer et al. [1] reported only a 27% employment rate 8 years following injury. Based on follow-up research, Catalano et al. [13] described adults with TBI as typically unemployed, with as many as two-thirds of those sampled unemployed at 1, 5, and 10 year follow-ups. Equally troubling, Hawthorne et al. [12] reported that as many as one-third of those adults with TBI who returned to work were employed in lower level jobs for reasons including lack of access to workplace accommodations and employers' lack of awareness of the effects of TBI.

Addressing high unemployment rates for adults with TBI is important for many reasons. Dillahunt-Aspillaga et al. [14] reported the results of a needs assessment in Florida in which participants with TBI identified employment as their number one priority. As reiterated in multiple sources, returning to work provides people with access to income, self-esteem, identity, and social status [7, 14, 15], yet traditional vocational rehabilitation services have only partially succeeded in helping people with TBI return to work. As Dillahunt-Aspillaga et al. stressed, a need exists for vocational rehabilitation interventions that directly address the problems that individuals with TBI encounter in employment. This recommendation is consistent with the previous emphasis on a holistic or contextual view of functioning in the job setting following TBI. One example of such a specialized vocational program providing a contextual perspective on job retention following TBI is an assessment of the way in which symptoms are interfering with on-the-job performance, career mastery, and job satisfaction.

1.2. A contextual job retention intervention

In a study comparing life outcomes of adults with TBI with those of a matched sample of uninjured adults, Hawthorne et al. [12] found that the TBI group had poorer general health and higher levels of unemployment, depression, and social isolation. Viewing these effects of TBI as remediable, they recommended long-term rehabilitation services and supports to enable adults with TBI to maintain

important life roles. As previously noted, one of these roles is that of an employee, which implies that assessments are needed periodically to determine whether adjustments are needed (i.e., job accommodations) to enable the person to fulfill job duties because personal skills and abilities change with TBI and job duties change with employer requirements. This type of periodic assessment is consistent with a holistic or contextual person-in-situation strategy to identify specific ways in which lack of job/person match could place the person at risk for termination or demotion. What this means specifically is that an assessment intervention is needed to enable the person to identify the job demands that are problematic as well as the potential job accommodations that are needed [14]. Proper accommodation restores the necessary correspondence between personal skills and job demands, resulting in greater productivity, career mastery, and job satisfaction for the person and continued value as a worker for the employer. Recent research pertaining to outcomes of the State-Federal Vocational Rehabilitation (VR) system in the United States underscores the importance of services with a close relationship to the process of getting and keeping a job for adults with TBI. Catalano et al. [13] reported that VR clients with the highest probability of successful (i.e., employed) case closure were those who received on-the-job training, job search and placement assistance, and on-the-job supports. Assessment of the person's abilities to satisfy job requirements with or without accommodation is one example of an on-the-job support that would benefit adults with TBI.

1.3. The Work Experience Survey

The Work Experience Survey (WES [16]) was designed to assess person-in-situation compatibility, specifically employee and job compatibility, in relation to barriers to worksite accessibility, barriers to performance of essential job functions, job mastery concerns, and job satisfaction ratings. Developed in research with adults with multiple sclerosis, arthritis, and TBI [16, 17], the WES assessment concludes with the development of a job accommodation plan drawing on knowledge of the employee, employer, rehabilitation professional, and information from resources such as the Job Accommodation Network (JAN [18]). The employee, employer, and rehabilitation professional should evaluate these accommodation strategies to determine the extent to which they restore the compatible relationship between worker and job and are perceived by the employer as practical and cost effective. When these conditions are met, individuals with TBI experience an increased probability of retaining satisfying employment, a meaningful adult role fundamental to one's sense of personal identity [10]. Empirical findings regarding the significant relationship between number of worksite accessibility and essential function barriers and extent of job satisfaction support the importance of a rehabilitation intervention based on results from a job/person contextual assessment such as the WES [19].

1.4. Purpose

The purpose of this study was to demonstrate the application of this person-in-situation or contextual assessment of job/person compatibility in the case of four employed college graduates with TBI. During their undergraduate studies, these students had participated in a Federally-funded academic and career enrichment project implemented by several of the authors of this article. The jobs that these participants held at the time of this study were obtained as part of the placement component of the grant-funded project [20], and they represented participants' first steps into their chosen professions. Success or failure at this juncture in their careers would have significant implications for their long-term ability to manage a personal career while coping with the effects of TBI, hence the need to adopt a holistic and contextual perspective on barriers to workplace accessibility and performance of essential functions and the accommodation plans needed to reduce or remove these barriers.

2. Method

Applying purposive sampling techniques from the qualitative research paradigm [21], the authors selected the four participants for this study to represent a range of career fields and job duties. The sample was limited to four participants to enable an in-depth description of each participant's job retention profile (see Results section).

2.1. Participants

Ranging in age from 25 to 32 years, this study's sample included three males and one female. Three participants identified their race/ethnicity as Cau-

casian and one participant identified himself as African American. All four participants had earned bachelor's degrees. Each participant was employed full-time at the time of the investigation, with weekly gross salaries ranging from $680 to $1,084. The job titles reported by participants in this study were Contract Specialist, Project Coordinator/Engagement Specialist, Readjustment Counseling Therapist, and Administrative Assistant. Participants had been coping with the sequelae of TBI for three to 13 years at the time of this investigation.

2.2. Instrumentation

In one telephone interview with the interviewer, each participant completed the six sections of the WES: background information, barriers to worksite accessibility, barriers to performance of essential job functions, job mastery concerns, job satisfaction ratings, and job accommodation plan (top priority barriers and feasible solutions [16]). In responding to the section on worksite accessibility, participants indicated whether they encountered any barriers created by public walks, parking lots, steps, and elevators. The essential functions section included job functions or conditions in six areas: physical abilities, cognitive abilities, task-related abilities, social abilities, working conditions, and company policies.

An abbreviated version of the Career Mastery Inventory (adapted with permission [22]), the self-report measure of job mastery consisted of 24 items addressing six areas of career mastery: getting the job done, fitting into the workplace, learning the ropes, getting along with others, getting ahead, and planning the next career step. Sample job mastery items are listed below:

- Believing that others think I do a good job
- Scheduling and planning my work ahead of time
- Knowing who to go to if I need help
- Eating lunch with friends at work
- Having a plan for where I want to be in my job in the future
- Considering what I will do in the future.

Previous research supports the internal consistency of the adapted and abbreviated job mastery scale (Cronbach's Alpha = 0.78 [19]).

The job satisfaction rating scale presents 20 work reinforcers from the Minnesota Theory of Work Adjustment [6]. With respect to their current employment experiences, participants used a three-point scale to indicate whether their access to a specific reinforcer was: (a) too little, (b) about right, or (c) too much. Examples of reinforcer items used in the WES are provided below:

- The job gives me a feeling of accomplishment
- I do something different every day
- I get recognition for the work I do
- My co-workers are easy to make friends with
- The company administers its policies fairly
- My pay compares well with that of other workers.

In previous WES research [19], the internal consistency reliability (i.e., Cronbach's Alpha) of the job satisfaction scale was 0.91.

The final section of the WES asks the worker to identify his or her three top-priority barriers from the previous sections of the WES, suggest a solution for each high-priority barrier, and generate a list of resources that could be enlisted in implementing those solutions. With input from the interviewer, this final section constitutes the essential elements of an accommodation plan that can be used as a basis for requesting needed workplace modifications from the worker's employer.

2.3. Procedure

Each WES telephone interview (one per participant) required 30–45 minutes to complete, and they were all conducted by the same interviewer. Based on the original plan developed at the end of the WES interview and information from the JAN website, the interviewer provided each participant with an accommodation plan. The participant and interviewer decided on a final accommodation plan, and the interviewer suggested strategies for participants to use in requesting needed accommodations from their employers [23]. Where feasible, these accommodations were implemented in the job setting and monitored to determine the extent to which they improved the individuals' job performance and satisfaction. Results from the WES interviews and the accommodation plans are presented in the results section to follow.

3. Results

The following case studies describe results from WES interviews with four employed college graduates with TBI. The intent is to illustrate how

health and rehabilitation professionals such as occupational therapists and vocational specialists can use the WES as a post-employment needs assessment strategy.

3.1. Case #1

The first case is that of a 29-year old Caucasian male who acquired his TBI at age 23 while serving in the United States Army in Afghanistan. Holding a bachelor's degree in Political Science, this honorably discharged veteran works full-time as a Contract Specialist for the Federal government. He earns approximately $825 per week before taxes. Specifically, this participant's job entails operating computers, attending briefings with contractors, and sorting and filing past contracts for military merchandise. When asked what symptoms associated with TBI pose functional limitations at work, this participant noted issues with multitasking, short-term memory, and coping with stress.

3.1.1. Accessibility

This participant reported that his workplace is almost entirely accessible, noting only two barriers – lighting in the workplace (lights too bright causing headaches) and barriers in public walks. The participant stated that he avoids public walks because several people using them at once can make him anxious.

3.1.2. Essential functions

With respect to performance of essential job functions, this participant mentioned a total of 24 problems – Seeing well, hearing well, handling, raising arms above shoulders, immediate memory, short-term memory, interpersonal judgement, thought processing, problem solving, work pace/sequencing, variety of duties, performing under stress/deadlines, little feedback on performance, reading written instructions, following specific instructions, remembering, speaking/communicating, initiating work activities, working around others, working with others, working with hostile others, heat sensitivity, noise, and always being inside. He identified no problematic company policies.

3.1.3. Job mastery

In the job mastery section, the participant noted only two concerns. He identified "believing that others think I do a good job" and "willing to make changes when necessary" as impediments to full mastery of his Contract Specialist position.

3.1.4. Job satisfaction

Generally satisfied with his position, this participant identified only three work reinforcers as problematic. He expressed dissatisfaction with doing something different every day (too little), giving instructions or telling people what to do (too little), and being able to try out some of his own ideas (too little).

3.1.5. Employee-identified accommodations

As noted in the Method section, the WES asks participants to suggest reasonable accommodations for their most prominent career maintenance barriers and identify resources that could assist them in implementing those solutions. This participant reduces his stress level by stepping out to the break room periodically, and he also suggested that he could benefit from self-help classes on managing stress and anxiety at work. Regarding his identified communication barriers, this participant emphasized the importance of taking detailed notes using assistive technology including his smart phone or tablet computer, then highlighting or bulleting instructions and deadlines that are most important. He also explained that he prefers communicating with clients and coworkers via email and that it is helpful for him to proactively disclose this preference to those with whom he works.

3.1.6. Accommodation strategies suggested by the Job Accommodation Network

After completing the WES interview with this participant, the interviewer contacted the Job Accommodation Network (JAN) and visited the JAN website for additional recommendations to address the participant's highest-priority job retention barriers. JAN consultants suggested the following strategies that the participant's employer could implement to help this individual manage stress at work:

- provide praise and positive reinforcement
- refer the worker to counseling and employee assistance programs
- allow telephone calls during work hours to counselors, doctors, and others for needed support
- provide disability awareness and sensitivity training to coworkers
- allow the employee to take periodic breaks as needed to relieve himself of stressful situations

To alleviate this participant's stated difficulties with interpersonal communication, JAN consultants recommended the following as possible accommodation choices:

- a job coach to help him understand different social cues
- identification of areas of improvement for the employee in a fair and consistent manner
- training videos to demonstrate appropriate behavior in the workplace
- minimizing personal conversations, or moving those conversations away from work areas
- encouraging all employees to model appropriate social skills, civility, and support for one another
- allowing the employee to communicate with co-workers and clients in his preferred modality (i.e. email)
- allowing the employee to work from home when necessary.

3.2. Case #2

The second case study involves a 25-year old African American male who acquired his TBI at age 21 as a result of a gunshot injury. Employed as a Project Coordinator/Engagement Specialist with a consulting organization, this participant works full-time with a gross weekly salary of $680. Drawing upon his bachelor's degree in Public Health Administration, his job primarily involves public outreach, organizing focus groups, and strategic planning. When asked what effects of TBI impinge (or have impinged) upon his job performance, he identified fatigue, memory loss, and frequent headaches.

3.2.1. Accessibility and essential functions

The participant conveyed that his workplace is totally accessible and did not indicate any problems getting to, from, or around the workplace on any of the items on the accessibility section of the WES. For essential job functions, the participant checked three conditions that pose problems— short-term memory, remembering, and vague job descriptions.

3.2.2. Job mastery and job satisfaction

In the job mastery section, the participant noted only one concern reflecting his uncertainty about getting the job done, specifically "Understanding how my job fits into the big picture." Of the 20 work reinforcers in the job satisfaction scale, participant #2 did not note any as sources of dissatisfaction.

3.2.3. Employee-identified accommodations

In the accommodation plan section of the WES, this participant identified notetaking and writing things down as solutions to help with his short-term memory issues. He indicated that he uses assistive technology-based reminders and notetaking "apps" that are loaded on his tablet computer to keep track of important work-related information electronically. The participant suggested that he could reach out to fellow staff members to help him with his short-term memory problems by making sure they write tasks down for him or send him emails so he has instructions and reminders that are readily available. With respect to his uncertainty about how his job fits into the big picture, this participant described communicating more frequently and effectively with coworkers, both in-person and electronically, as a possible solution.

3.2.4. Accommodation strategies suggested by the Job Accommodation Network

JAN consultants recommended the following accommodation strategies to help this participant compensate for his short-term memory difficulties:

- allow the employee to tape-record meetings
- provide type written minutes of each meeting
- use notebooks, calendars, or sticky notes to record information for easy retrieval
- provide written as well as verbal instructions
- allow additional training time
- provide written checklists and use color-coding to help identify items
- post instructions close to frequently used equipment

In terms of strategies for clarifying how this person and his job fit into his employer's "big picture," JAN consultants had several ideas about how he could become a more prominent part of the social fabric at work. Noting that tremendous opportunities to learn about corporate culture emerge from deepening one's connections with co-workers and supervisors, consultants offered the following suggestions:

- provide positive praise and reinforcement
- write clear expectations of responsibilities and the consequences of not meeting them
- allow for open communication with managers and supervisors
- establish written long and short-term goals for all employees and teams within the organization

- develop strategies for dealing with problems as soon as they arise.
- provide written work agreements for group projects
- take part in informal social events and activities during the workday and outside of work.

3.3. Case #3

The third participant is a 32-year old Caucasian male who sustained his brain injury at the age of 19 while serving in the military. Like Case #1, this individual is an honorably discharged veteran. He holds a bachelor's degree in Health and Wellness. He works full-time as a Readjustment Counseling Therapist with the United States Veterans Administration. He has held that job for four years. His gross weekly salary is approximately $800. Specifically, his position involves psychological and cognitive testing, conducting motivational interviews, and making referrals to mental health and social service agencies for other military veterans with disabilities. He identified problems with concentration, balance, and sensitivity to light as his main TBI-related work limitations.

3.3.1. Accessibility and essential functions

Although this participant identified his worksite as generally accessible at the time of the interview, he noted that public sidewalks, steps, and lighting have posed problems for him. As for essential functions, he mentioned several present concerns. These related to physical abilities (seeing well, using left hand), cognitive abilities (thought processing, organizing), task-related abilities (little feedback on performance), social abilities (working around others), working conditions (too humid, slippery surfaces, obstacles in path, odors, outdoors, sometimes indoors), and company policies (vague job descriptions, infrequent reviews of job descriptions).

3.3.2. Job mastery and satisfaction

This participant reported two concerns in the job mastery section: "Having what I need to do my job (knowledge, tools, supplies, equipment)" and "Talking with my supervisor about what I need to do to get promoted." *He* identified three work reinforcers as areas of concern. Specifically, he cited having not enough time to work alone, too little recognition for the work that he does, and too little training from his employer.

3.3.3. Employee-identified accommodations

The third participant generated several possible solutions to his on-the-job barriers. For his issue with lighting in his work station, the participant suggested that he could speak with his supervisor about the matter, explain why the bright lighting causes problems due to his brain injury, and request softer lighting. The participant stated that he could contact his supervisor, the disability services office within the Veterans Administration, or the United States Equal Employment Opportunity Commission regarding these concerns. He also indicated that he could use several alternate routes that are less crowded to enter his workplace. For his third high-priority barrier – not enough time working alone –this participant suggested that he could, again, contact his supervisor about the matter and ask for time in his work schedule to be set aside for him to work independently on reports and other correspondence.

3.3.4. Accommodation strategies suggested by the Job Accommodation Network

To address the issue of bright lighting in this participant's work station, JAN consultants recommended the following possibilities:

- change fluorescent lights to high intensity, white lights
- increase natural lighting
- provide a glare guard for computer monitors.

To alleviate the anxiety that this participant reported when encountering crowded public walkways, JAN consultants identified several potential accommodation strategies, including:

- play soothing music using headphones while traversing public walks
- refer the employee to counseling and employee assistance programs to address social anxiety issues
- ask employer to request that other employees not gather in large groups in or alongside public walks.

Finally, to facilitate this participant's request to his employer that time be set aside in his work schedule to perform concentrated work alone and in a private space, the JAN website lists the following guidelines:

- be specific about the accommodation that is being requested
- consider submitting the request in writing or via email

- explain how the requested accommodation will benefit the worker and the employer
- be prepared to consider alternatives to the requested accommodation if the employer has other ideas
- emphasize that the accommodation can be implemented at no cost to the employer.

3.4. Case #4

The final case is that of a 25 year-old Caucasian woman who acquired her TBI at the age of 22 as the result of several concussions. She has a bachelor's degree in Business Administration and is employed as an administrative assistant at a university. She earns $1,084 per week before taxes. In terms of required tasks, this participant's job entails scheduling, note-taking, and answering telephones and emails. When asked what symptoms of her brain injury present functional limitations at work, she noted issues with concentration and her attention span, reading, and organization.

3.4.1. Accessibility

This participant reported only two concerns about the accessibility of her worksite. The most prominent of these was temperature; she described her building as having "terrible HVAC" and noted that the temperature in the building is usually either too hot or too cold. Her other accessibility issue involved lighting (too bright), which often reflects on her computer screen and makes it difficult for her to read electronic information.

3.4.2. Essential functions

In the essential functions section of the WES, she identified a number of problem areas. These included physical abilities such as fatigue she experiences while working eight-hour shifts and being required to talk too much, which also causes fatigue. She also identified problems with cognitive abilities such as immediate memory, short-term memory, long-term memory, interpersonal judgement, thought processing, and organizing. She also indicated difficulty with task-related abilities (repetitive work, little feedback on performance, reading written instructions, remembering), social abilities (working alone and working around others), working conditions (too hot, too cold, temperature changes, noise), and especially company policies (inflexible work schedules, no "comp" time, vague job descriptions, infrequent reviews of job descriptions, rigid sick/vacation leave policies).

3.4.3. Job mastery and job satisfaction

Across three job mastery categories, this participant checked only two problems, "understanding company rules and regulations" and "knowing what is expected of me socially on the job." This participant identified two work reinforcers as problematic — too little use of her abilities and too few opportunities for advancement.

3.4.4. Employee-identified accommodations

In identifying possible accommodations and resources to conclude the interview, this participant suggested that the socialization difficulties she reported in previous sections of the WES could be lessened by asking her co-workers for advice on how to properly respond to emails or on how her supervisors should be addressed. She noted that she had worked at her present job for only eight months and that she therefore may need additional time to become comfortable in the workplace and learn how the employees interact. To address the problems that she experiences in understanding company rules and regulations, the participant explained that she often contacts the university's human resources office with questions. She does this because the rules and regulations listed on the university's website are difficult for her to read and understand. The participant's concern regarding the utilization of her abilities is addressed by direct communication with her supervisor. The participant has politely conveyed to her supervisor that she feels she is not being challenged enough and is interested in transferring to a higher-level position.

3.4.5. Accommodation strategies suggested by the Job Accommodation Network

To address the issue of social interactions with her coworkers, JAN consultants suggested the following strategies for her employer to consider:

- thoroughly review the organizational conduct policy with the employee.
- provide concrete examples of appropriate and inappropriate interactions between coworkers.
- be available to discuss issues of social etiquette in the workplace with the employee.
- recognize and reward appropriate behavior.
- provide sensitivity training to coworkers to promote disability awareness.

- help the employee "learn the ropes" by providing a mentor.
- make employee attendance at social functions optional.

JAN consultants also recommended several strategies for improving communication with this participant's supervisors regarding university policies and opportunities for advancement:

- point out the specific university policy that is most closely related to each of the employee's assigned tasks.
- make sure that the employee is aware of internal job postings that meet with her qualifications and would constitute a promotion for her.
- identify a mentor within the university who holds a position to which the employee aspires.
- hold regular meetings with the employee to answer questions she has about university policies and about career advancement opportunities within the university.

4. Discussion

Results indicate that the primary purpose of the study was achieved, namely, the demonstration of a strategy (i.e., the WES) that provides an ecological assessment of the interaction between employees with TBI and their immediate work environment. As Dillahunt-Aspillaga et al. [14] stressed, rehabilitation professionals should place greater emphasis on gathering such information (i.e., person-in-situation data) to increase the effectiveness of rehabilitation interventions and the probability of job retention for individuals coping with TBI. Furthermore, sections of the WES are compatible with recommended requirements for vocational evaluation following traumatic brain injury. Stergiou-Kita, Dawson, and Rappolt [24] recommended that vocational evaluations should address aspects of the physical work environment, workplace culture, and available supports and opportunities. They also called for greater involvement of employers in the process of helping individuals with TBI adapt to the work setting in terms of suggesting both changes in the worker and changes in the work environment. The concrete suggestions provided by JAN pertaining to each of the case studies represent valuable information that employers could use in communicating with their employees.

Consistent with the different contexts in which participants worked, a variety of accessibility, essential function, job mastery, and job satisfaction concerns emerged. However, one important similarity among participants is important to note. Participants reported a constellation of cognitive limitations that interfered with their success in the workplace, including difficulties with multi-tasking, short-term memory, memory loss, and concentration. They also experienced the physical and psychological sequelae of TBI such as frequent headaches, fatigue, balance problems, sensitivity to light, and low stress tolerance.

Issues pertaining to balance and light sensitivity emerged in the description of accessibility barriers in the WES interviews. Two of the participants encountered barriers in public walkways such as steps and poor lighting, and one commented that lighting in the workplace (too bright) affected his job performance. Fortunately, they also mentioned strategies to reduce or remove these barriers such as finding less crowded routes to work and discussing needs for softer lighting with the employer.

The impact of the participants' cognitive and physical limitations was evident in the number of essential function difficulties they experienced in their work (e.g., $n=24$, $n=14$, $n=3$, and $n=17$). Obviously, employed participants experiencing 14 to 24 concerns are in a vulnerable position vis-a-vis job retention and, thus, should receive more immediate attention in any "triage" approach to providing on-the-job accommodation assistance. One of the strengths of the WES assessment is that these essential function difficulties are specifically described, which serves to guide discussions among rehabilitation counselors, employers, and employees as well as searches of job accommodation suggestions using resources such as JAN [18].

Job mastery concerns present unique insights into potential problems in job retention. Each of the participants presented different concerns that, in every case, have a direct bearing on their long-term career development and should, therefore, be addressed in rehabilitation follow-along interventions in the workplace. Concerns expressed by participants in this study included believing that others think I do a good job, willing to make changes when necessary, understanding how my job fits into the big picture, having what I need to do my job (knowledge, tasks, supplies, and equipment), and talking with my supervisor about what I need to do to get promoted.

One should note that the participants' career mastery concerns stem from two sources, a) idiosyncratic

aspects of a specific work personality and job setting and b) the more generalized effects of TBI on worker/job outcomes. For example, research suggests that, given the effects of TBI, some workers lose confidence in their ability to satisfy job demands [3, 5]. This lack of confidence may explain why one of the participants was concerned that others might think he was not doing a good job. Another participant's impression that he did not have what was needed to do a good job suggests some possible difficulties in requesting and receiving job accommodations. On the other hand, difficulties speaking with a supervisor about what is needed to be promoted and understanding how one's job fits into the big picture represent concerns faced by all workers.

Participants reported high levels of job satisfaction. One individual reported no areas of dissatisfaction, one participant reported two areas of dissatisfaction, and two participants each reported three areas of dissatisfaction among the 20 work reinforcers. The importance of this finding is underscored in research based on propositions of the Minnesota Theory of Work Adjustment documenting that job satisfaction is a predictor of job tenure. Thus, remediating barriers to job satisfaction, if they exist, is an important step toward increasing the probability of job retention among adults with TBI, although it is important to acknowledge that participants in this study were satisfied with their jobs.

Overall, results of this study underscore the importance of ecological approaches to work assessment [25, 26] and the value of an efficient strategy such as the WES to conduct such an assessment. Such an assessment should be comprehensive in nature, providing insights into what Strauser [27] called for in his tripartite model of work adjustment that includes: a) disability-related barriers to job performance (e.g., physical, cognitive, and psychological symptoms), b) environmental factors (e.g., co-worker attitudes, on-the-job accommodations, employer discrimination), and c) interactive influences of the disability and the environment. Rehabilitation professionals should also note that the data collected with the WES were gathered in telephone interviews with participants rather than in site visits, which speaks to the cost effectiveness of the WES [28].

Although follow-up interventions to aid participants in implementing the accommodation strategies they identified are beyond the scope of this study, data from the WES provide the basis for a discussion among worker, employer, and rehabilitation professional regarding not only threats to job retention but also accommodations needed to reduce or remove those threats. Research on the recommended categories of accommodations that should be considered in discussions to help people with TBI enhance their job satisfaction and productivity is helpful in this regard. In their qualitative study, Stergiou-Kita, Dawson, and Rappolt [29] asked clinical providers to generate principles of vocational evaluation following TBI. From the point of view of clinical providers, quality vocational assessments and reports should include recommendations regarding "accommodations and or job modifications in relation to work activities, work hours, and graduated return to work schedules; workstation modifications (including reductions to distractions) and adaptive aids/devices and opportunities to apply compensatory strategies; availability of workplace supervision (identification of individuals able to provide ongoing feedback regarding work performance; availability of instrumental support from natural sources in the community such as family, volunteer, or hired support); and availability of vocational rehabilitation supports and services and transportation if the individual is unable to drive" (p. 173). Obviously, consultation regarding the breadth of these accommodations is not a one-time event but rather is needed as disability-related symptoms change, as the person ages, and as employers continue to consider the healthiness and inclusiveness of the workplace as important priorities [30–32].

4.1. Limitations

This investigation has several limitations, the first of which is inherent in using a qualitative case study approach. The sample is limited in size, which affects the diversity of the participants in terms of racial-ethnic and socio-economic characteristics. Although the study was designed to investigate the fit between employed individuals with TBI and their jobs, it did not address issues encountered by participants who had recently lost a job secured with the assistance of project personnel. The time frame of the investigation did not allow for follow-up intervention in the workplace to facilitate collaborative accommodation efforts between employees with TBI and their supervisors and employers, nor did it permit the interviewer to engage directly with employers and/or rehabilitation professionals on behalf of participants. Future studies should not only investigate the outcomes of this process but also the effects of training employees

with TBI in strategies for independently requesting and implementing the workplace accommodations that they identify through the WES interview and JAN consultation [8, 23, 33].

5. Conclusion

Individuals coping with the effects of TBI experience a variety of cognitive, psychological, and physical symptoms that affect their abilities to succeed in the workplace. Nevertheless, adults with TBI have not only a strong commitment to the work role but also the potential to succeed as employees given proper job modifications. For this reason, information pertaining to the nature of the interaction between individuals with TBI and the work setting (e.g., an ecological assessment) is critical if proper accommodations are to be identified and implemented.

As demonstrated in the four case studies, the Work Experience Survey (WES) is one practical method for identifying barriers that workers with TBI are encountering and for initiating discussions about ways to reduce or remove those barriers. Four sections of the WES elaborate on the ways in which TBI influences access to the worksite, performance of essential functions, job mastery, and job satisfaction. If left unaddressed, problems in each of these areas have the potential to disturb worker/job equilibrium. In this study, participants with TBI expressed difficulties in each of these areas, with the bulk of issues in the category of performance of essential functions resulting from the multiple cognitive, physical, and psychological symptoms associated with TBI. Participants also indicated job accommodations that have increased or would increase their productivity, which provided a basis for accessing other resources such as JAN consultants and its online database. Suggestions from JAN supplement ideas from the worker and the employer and provide information pertaining to the costs and sources of workplace accommodations. Consequently, combining information from the WES and JAN fills an important gap in the assessment of the needs of adults with severe disabilities such as TBI who wish to succeed and advance in their employment.

6. Author Note

The contents of this article were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR, grant number 90DP0062-01-00). NIDILRR is a Center within the Administration for Community Living (ACL), U.S. Department of Health and Human Services (HHS). The contents of this article do not necessarily represent the policy of NIDILRR, ACL, or HHS, and the reader should not assume endorsement by the federal government.

Conflict of interest

None to report.

References

[1] Coetzer R, Carroll E, Ruddle J. Depression, anxiety, and employment status after traumatic brain injury. Social Care and Neurodisability 2011;2:200-07.
[2] Mealings M, Douglas J, Olver J. Considering the students' perspective in returning to school after TBI: A literature review. Brain Injury 2012;26:1165-76.
[3] Muenchberger H, Kendall E, Neal R. Identity transition following traumatic brain injury: A dynamic process of contraction, expansion, and tentative balance. Brain Injury 2008;22:979-92.
[4] Centers for Disease Control. Get the Facts Sheet. Atlanta, GA: 2016. 1 p.
[5] Hall A, Grohn B, Nalder E, Worrall L, Fleming J. A mixed methods study of the experience of transition to the community of working age people with non-traumatic brain injury. Brain Impairment 2012;13:85-98.
[6] Swanson J, Schneider M. Minnesota theory of work adjustment. In: S. Brown & R. Lent, editors. Career Development and Counseling. 2nd Edition. Hoboken, NJ: John Wiley. 2013. p. 29-54.
[7] Saunders S, Nedelec B. What work means to people with work disability: A scoping review. Journal of Occupational Rehabilitation 2014;24:100-10.
[8] Rumrill P, Wehman P, Cimera R, Kaya C, Dillard C, Chan F. Vocational rehabilitation services and outcomes for transition-age youth with traumatic brain injuries. Journal of Head Trauma Rehabilitation 2016;31:288-95.
[9] Ciccia A, Threats T. Role of contextual factors in the rehabilitation of adolescent survivors of traumatic brain injury: Emerging concepts identified through modified narrative review. International Journal of Language and Communication Disorders 2015;50:436-51.
[10] Cotton, G. Occupational identity disruption after traumatic brain injury: An approach to occupational therapy evaluation and treatment. Occupational Therapy in Health Care 2012;26:270-82.
[11] Wright C, Zeeman H, Biezaitis V. Holistic practice in traumatic brain injury rehabilitation: Perspectives of health practitioners. PLOS One [internet]. 2016[cited January 18,2017];11(6). Available from: URL 0156826.dol10.137/journal.pone.0156826.
[12] Hawthorne G, Gruen R, Kaye A. Traumatic brain injury and long-term quality of life: Findings from an Australian study. Journal of Neurotrauma 2009;26:1623-33.

[13] Catalano D, Pereira A, Wu M, Ho H, Chan R. Service patterns related to successful employment outcomes of persons with traumatic brain injury in vocational rehabilitation. NeuroRehabilitation 2006;21:279-93.
[14] Dillahunt-Aspillaga C, Jorgenson-Smith T, Ehlke S, Hanson A, Sosinski M, Gonzalez C. Disability adjustment and vocational guidance counseling for individuals with traumatic brain injury. Journal of Applied Rehabilitation Counseling 2015;46(1):3-13.
[15] Rubin S, Roessler R, Rumrill P. Foundations of the Vocational Rehabilitation Process. 8th Ed. Austin, TX: PRO-ED;2016. 590 p.
[16] Roessler R, Reed C, Rumrill P. The Work Experience Survey (WES) Manual. Fayetteville, AR: Arkansas Research and Training Center, University of Arkansas; 1995. 32 p.
[17] Allaire S, Li W, LaValley M. Work barriers experienced and job accommodations used by persons with arthritis and other rheumatic diseases. Rehabilitation Counseling Bulletin 2003;46:147-56.
[18] Rich D, Spicer P, Vaughn K. Helping veterans with disabilities transition to employment. Journal of Postsecondary Education and Disability 2009;22:67-74.
[19] Rumrill P, Roessler R, Vierstra C, Hennessey M, Staples L. Workplace barriers and job satisfaction among employed people with multiple sclerosis: An empirical rationale for early intervention. Journal of Vocational Rehabilitation 2004;29:177-84.
[20] Hendricks DJ, Sampson E, Rumrill P, Leopold A, Elias E, Jacobs K, Nardone A, Scherer M, Stauffer C. 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 2015;37:449-58.
[21] Rumrill P, Bellini J. Research in rehabilitation counseling. 3rd edition. Springfield, IL: Charles C. Thomas; 2017. 348 p.
[22] Crites J. The Career Mastery Inventory. Boulder, CO: Crites Career Consultants, Inc.; 1990.
[23] Roessler R, Rumrill P. Enhancing productivity on your job: The 'win-win' approach to reasonable accommodations. New York: National Multiple Sclerosis Society; 2015. 14 p.
[24] Stergiou-Kita M, Dawson D, Rappolt S. An integrated review of the process and factors relevant to vocational evaluation following traumatic brain injury. Journal of Occupational Rehabilitation 2011;21:374-94.
[25] Power P. A Guide to Career Management and Programming for Adults with Disabilities: A 21st Century Perspective. Austin, TX: Pro-Ed; 2011. 419 p.
[26] Wehman P. Life beyond the classroom. Baltimore, MD: Paul Brookes; 2013. 719 p.
[27] Strauser D. Career development, employment, and disability in rehabilitation. New York: Springer Publishing Company; 2013. 504 p.
[28] Fakolade A, Finlayson M, Plow M. Using telerehabilitation to support people with multiple sclerosis: A qualitative analysis of interactions, processes, and issues across three interventions. British Journal of Occupational Therapy 2017;80:259-68.
[29] Stergiou-Kita M, Dawson D, Rappolt S. Interprofessional clinical practice guidelines for vocational evaluation following traumatic brain injury: A systematic and evidence-based approach. Journal of Occupational Rehabilitation 2012;22:166-81.
[30] Roessler R, Rumrill P. Reducing worksite barriers to enhance job satisfaction: An important post-employment service for employees with chronic illnesses. Journal of Vocational Rehabilitation 1998;10(3):219-29.
[31] Koch L, Rumrill P. Assessing consumer satisfaction in rehabilitation and health care settings. Work: A Journal of Prevention, Assessment, and Rehabilitation 2008;31(3):357-63.
[32] Jakobsen K. Making the healthier choice at work the easier choice: From a focus on risk factors to health promotion. Work: A Journal of Prevention, Assessment, and Rehabilitation 2016;53(1):57-60.
[33] Bishop M, Rumrill P. A commentary on employment and community living for Americans with multiple sclerosis. Work: A Journal of Prevention, Assessment, and Rehabilitation 2015;52(4):723-25.