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**PRE- AND POST-ACCIDENT EMPLOYMENT AND
EMPLOYMENT-RELATED FACTORS FOLLOWING
TRAUMATIC BRAIN INJURY**

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ABSTRACT

A total of forty individuals, from three rehabilitation centres in the Auckland area, participated in an exploratory study on return to work following traumatic brain injury. All of the participants were employed in some capacity prior to their injuries. Eleven of these individuals had not returned to work, and twenty-seven individuals had returned to work post-injury. Twelve of the latter group did not sustain their employment. Data analyses revealed that groups of participants did not differ significantly with respect to self-assessments of pre-injury job satisfaction, job performance, and job importance. However, with respect to post-injury job importance, significant differences were found between individuals who were not employed, those who unsuccessfully returned to work, and those who were currently employed post-injury. Single individuals had higher ratings of post-injury job performance, than partnered individuals. The majority of participants considered emotional support from families important for a successful return to work. Conversely, functional support from employers was considered important by more participants than emotional support. Nine employers of the individuals with traumatic brain injury who were surveyed completed employers questionnaires. The implications of the survey results for the coordination and planning of rehabilitation programmes are explored.

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Introduction

The reintegration, where possible, of brain injured individuals into the workplace is a desirable goal within rehabilitation programmes. Although there is a growing awareness of the disorder known as TBI (traumatic brain injury), there remains a general lack of recognition and understanding of associated symptoms, and consequences among professionals and the general public (Accident Rehabilitation and Compensation Insurance Corporation Report 1998; Morse & Montgomery, 1992). Hallauer (1989, cited in Ninomiya, Ashley, Raney, & Krych, 1995) found a surprising lack of experience with the TBI population among vocational rehabilitation counsellors (VCR). In their study of the experience levels of vocational rehabilitation counsellors, only two out of 46 had experience with more than 100 TBI clients. As can be expected, a lack of experience in the part of such professionals could affect both the process, and outcome, of vocational rehabilitation programmes developed for clients.

TBI is one of the leading causes of death and neurological disorder today (Jacobs, 1988; Stambrook, Moore, Lubusko, Peters, & Blumenschein, 1993). Until as recently as the last decade, accidents involving severe brain injury typically resulted in death. However, continued improvements in medical technology and procedures have contributed to a growth in the population of survivors of brain injury in need of support of various kinds.

Brain injury tends to affect the primary working population, usually males, between the ages of 15 to 60. People with TBI's are at increased risk for unemployment due to the severity of their injuries and associated neuropsychologic impairments. In most modern countries, where employment is central to one's identity, the change in roles, from working to being unemployed, is often a very difficult one for people with TBI.

Resnick (1994) argued that TBI is an international public health issue with emotional, financial, psychological, and social consequences for both the victim and society as a whole. Families are confronted with a potential loss of income and consequent economic downturn, and society must bear the protracted cost of care and

rehabilitation. For these reasons, post-injury employment is considered to be of considerable importance, and return to work following TBI has become a popular focus for research.

A study conducted by Webb, Wrigley, Yoels, and Fine (1995) indicated that employment is the strongest contributor to improved quality of life following TBI. Studies on return to work, have in the main, focused on severe TBI. A few studies have compared mild, moderate, and severe injury groups. As would be expected, severely injured individuals tend to have a poorer prognosis for employment than either mildly or moderately injured people. Mildly brain injured individuals, even though they may continue to report problems throughout their lives, have a higher rate of return to work than other groups. Many are able to perform almost normally under most conditions. However, their behaviour may deteriorate under conditions that would trouble a person without brain injury only slightly.

A number of studies on return to work have found correlations between premorbid factors such as education and employment history, and employment outcomes following TBI (Fraser, Dikmen, McLean, Miller, & Temkin, 1988). Nevertheless, the role of such pre-existing influences is often not taken into account in studies of return to work. Whilst post-injury employment status has been found to be of major importance to TBI survivors and their families, few researchers have studied job satisfaction among survivors who are employed across a range of occupations. Identifying the variables that are associated with job satisfaction following TBI could assist in the development of vocational rehabilitation and increase the likelihood that job placement will result in job retention over time.

Few studies have focused on the effects of social support on functional outcomes following TBI. This is despite the fact that the influence of social support on stress level is well documented (Kaplan, 1990). Attending to the multiple demands of daily living often proves difficult for people with brain injuries. In fact, the behaviour of people with TBI tends to deteriorate under stress or fatigue brought on by the rigours of performing simple everyday tasks. When the stresses of home life spread to work, or from work to home, or in both directions simultaneously, this is referred to as spillover (Bromet, Dew, & Parkinson, 1990). Stressors from the home include the

amount of housework that individuals are responsible for over and above their work outside of the home. It is possible that the problems associated with TBI increase the likelihood of spillover.

It seems likely that receiving assistance with daily chores could reduce the spillover effects of home-work stress for people with TBI. For example, expending less energy on daily chores such as washing, shopping, cooking, and other aspects of daily home maintenance, could reduce the level of stress by preventing individuals from becoming over tired. This, in return, should enhance work performance and job satisfaction.

Having a supportive employer and workplace supervisor or mentor is essential for successful post-injury work reintegration. It is important for employers of TBI individuals to have a good understanding of the long-term problems associated with the condition.

The first two chapters of this thesis will provide a definition and overview of traumatic brain injury including some of its consequences, assessments of outcome, rehabilitation following TBI, and returning to work. These chapters will be followed by an outline of the research reported here, which is aimed at gathering information on factors other than neurological ones, that may influence a return to work among victims of TBI within New Zealand.

CHAPTER ONE

Overview and Outcomes of Traumatic Brain Injury

Definition

Traumatic brain injury is an acquired condition that is defined as “a non degenerative, non developmental injury or disease of the brain, resulting in significant physical, cognitive, or psychological loss of function” (Brantner, 1992). Such impairments may be either temporary or permanent and cause partial or total functional disability or psychosocial maladjustment (Spivack & Balicki, 1990)

The National Head Injury Foundation (USA) described traumatic brain injury as the “silent epidemic” (Testani-Dufour, Chappel-Aiken, & Guelder, 1992). It can also be said that “traumatic brain injury happens to a family” (Smigielski & Nelson, 1990, pg. 73). Many cases of mild brain injury go undiagnosed. For example, if an accident victim is admitted to hospital with multiple injuries, a brain injury may go undiagnosed, or may be given lower priority than other injuries requiring immediate medical attention. A patient is not typically diagnosed and coded singularly upon admission as brain injured (Morse & Montgomery, 1992).

A combination of symptomatic deficits in everyday activities, and apparently normal performance on clinical tests is not uncommon. In the light of this, clinicians may be persuaded that a patient is exaggerating the outcome of his or her TBI (Alexander, 1995). Mild TBI causes a variety of functional limitations that are often misunderstood by both clients and professionals (Koch, Merz, & Lynch, 1995). Indeed, it is not uncommon for people with brain injuries to be misdiagnosed as suffering from a psychological disorder. Furthermore, severely injured persons are often treated as persons with developmental retardation or learning disabilities. This misapprehension is often exacerbated by the tendency for TBI individuals to be unaware of their problems even when a clinical diagnosis has been given (Kay & Lezak, 1990).

There are a number of important ways in which TBI can be differentiated from other types of brain damage. Firstly, damage due to TBI is generally acquired by

individuals in the course of what may have been normal development. Secondly, TBI occurs suddenly, and individuals are left significantly changed immediately after the injury. Thirdly, unlike strokes, tumours, or even penetrating brain injuries, closed brain injuries are often not confined to one area of the brain.

Head injuries cause damage partly by subjecting the brain to rotational forces that drive brain tissue against the inside of the skull. As a consequence of the coup and contre-coup action, damage tends to be diffuse or widespread, and therefore it does not usually result in only one kind of deficit (Kay & Lezak, 1990). However, in many cases of TBI, specific cognitive, behavioural, and mood disorders can be attributed to frontal lobe damage, either directly or indirectly (Levin, & Kraus, 1994). The long-term severity of various deficits can be difficult to predict as it tends to vary greatly depending on the nature, location, and extent of the injury.

A major cause of closed head injury today is motor vehicle accidents. Other causes include sports accidents, falls, and fights or assaults. A few years ago many accident victims died from the complications caused by their injuries. Today, however, the combined benefits from increased efficiency in emergency medical services, and the improved effectiveness of neurosurgical procedures, have increased the survival chances of people who sustain even the most severe traumatic brain injuries (Willer, Allen, Liss, & Zicht, 1991).

Survivors of brain injury not only escape death, but can also be expected to live a normal life span. According to Stambrook Moore, Peters, Deviaenes, and Hawryluk (1990), even individuals who have sustained severe head injuries can expect only a 5 year reduction in life expectancy over the next 20 years compared to a healthy person. However, survival often means living with life-long disabilities, because individuals with TBI usually exhibit cognitive and behavioural disabilities many years post-injury.

Classification

Brain injury is generally classified according to the following categories: Acute Primary/Secondary, and Open/Closed brain injury. The physical impact from an accident involving acceleration or deceleration can create immediate injury to both diffuse and focal brain areas. Acute Primary brain injury refers to damage occurring

at the time of injury. Primary brain injury can be further divided into three types. They are: 1) fronto-temporal contusions (where damage results from rough bones at the base of the skull); 2) diffuse axonal injury (due to shearing strain throughout the brain); and 3) coup/contrecoup injury (due to bouncing of the brain off opposite sides of the skull) (Kay & Lezak, 1990).

Secondary damage to the brain may occur due to epidural hematomas (bleeding between the skull and the brain covering) or subdural hematomas (bleeding between the brain covering and the brain tissue) (Kay & Lezak, 1990). In the course of an accident, the brain itself may remain uninjured. However, acute secondary injury may result from systemic non-cerebral origin, such as when the brain is deprived of oxygen and nutrients. Damage to the brain may continue to occur days after initial impact. Damage may also occur due to secondary intracranial processes such as narrowing of arteries, epilepsy, and infection (Morse & Montgomery, 1992).

TBI severity is typically grouped into mild, moderate, and severe. Severity categories are usually determined by establishing the individual's level of unconsciousness as scored on the Glasgow Coma Scale (GCS), and the duration of post-traumatic amnesia (PTA) (Cifu, Keyser-Marcus, Lopez, Wehman, Kreutzer, Englander, & High, 1997; Morse & Montgomery, 1992). The efficacy of these two measures as predictors of prognosis following TBI have been well studied.

Prior to the development of the GCS there was extensive variety and little consistency in the terminology and systems used to describe and assess depth of unconsciousness. Its introduction in 1974 allowed for standardized and precise measurement of depth and length of unconsciousness (Teasdale & Jennett, 1974 cited in Stambrook, Moore, Lubusko, Peters, & Blumenschein, 1993). The GCS is a 15 point scale and is used to determine the level of consciousness based on the complexity of three responses: eye opening, best motor response, and verbal response. The total of the numerical rankings is the overall score which indicates the depth of the patient's coma. The GCS is widely used and is able to distinguish between severe comatose patients and those with minor TBI (Pepero, Snyder, Gotschall, Johnson, & Eichelberger, 1997). However, it has been found to be much less effective in defining the response level in patients considered to have a moderate TBI than an alternative

measure, the Swedish Reaction Level Scale (RLS85) (Brown, Jones, Anderson, & Tocher, 1993; Johnstone, Lohlun, Miller, McIntosh, Gregori,). The GCS has been limited in situations where patients have sustained facial injuries resulting in traumatic swelling, rendering assessment of eye opening difficult, and where prior intubation has made assessment of the vocal component of the scale impossible. The RLS85 has been found to confer some advantage over the GCS in these situations (Johnstone et al., 1993).

Post traumatic amnesia refers to the period between the injury and the recovery of continuous memory for day-to-day events (Morse & Montgomery, 1992). Using the duration of PTA as measure of severity has also been questioned, not least because of its reliance on retrospective information from the patients, but it also has its supporters. In his article on assessment of the severity of head injury, Jennett (1976) concluded that although no one method of assessing severity is appropriate for all types of head injury, description of severity should always include reference to duration of coma and PTA.

Generally, individuals with a GCS score of 12 or higher at acute hospital admission, and a PTA score of less than 1 hour, are considered to have a mild head injury. A score of 9-11 on the GCS, with PTA duration of 1-24 hours defines moderate TBI, while a score of 8 or less on the GCS, and PTA duration of one day or more defines severe TBI (Brown & Nell, 1992; Morse & Montgomery, 1992).

Epidemiology

Definitive data regarding the incidence and prevalence of TBI are difficult to establish. Some of the issues that have contributed to this include inconsistent definitions of TBI, and lack of standardised reporting mechanism. (Spivack & Balicki, 1990). Some of the most extensive epidemiological data on TBI are based on surveys and studies carried out in the United States, where brain injury is reported to be a leading cause of death and disability for individuals under the age of 35 (Jacobs, 1988). Its incidence in this age group exceeds that of epilepsy, Parkinson's disease, Multiple Sclerosis, Huntington's disease, and Amyotrophic Lateral Sclerosis combined. It is also four times more likely to occur than mental retardation (McMordie, Barker,

& Paolo, 1990). The only neurological disorders with a higher frequency in the number of individuals affected are cerebrovascular accidents or strokes (Morse & Montgomery, 1992).

In the United States, an estimated 8 million people receive closed head injuries each year. Of these between 350,000 to 500,000 people are subsequently hospitalised with a diagnosis of TBI (Abrams, Barker, Haffey, & Nelson, 1993; Greenspan, Wrigley, Kresnow, Branche-Dorsey, & Fine 1996; Morse & Montgomery, 1992; Webb, Wrigley, Yoels, & Fine, 1995). Approximately 50,000 to 100,000 survive, but are left with severe and permanent physical, cognitive, and behavioural impairments. Many suffer from the continuing effects of TBI that interfere with various aspects of daily living (Jacobs, 1988).

The most recent New Zealand investigation on the number and needs of TBI was carried out in conjunction with the Accident Rehabilitation and Compensation Insurance Corporation (ACC) and the Brain Injury Association, Auckland (ACC, 1998). Interviews were carried out with 154 randomly selected individuals residing within Manukau City, whereby 26% reported that they had sustained a brain injury. The ACC survey found that many participants felt that they had not received adequate information about brain injury and its effects. A lack of ongoing support in relation to the effects of brain injury was also identified. Hospital discharge records between May 1996 to April 1997, showed that the incidence of brain injury was 167 per 100,000 for the South Auckland patients, and 147 per 100,000 for patients resident in Central Auckland.

The use of seatbelts have been found to reduce the incidence and severity of closed brain injuries from motor vehicle accidents (Smith-Seemiler, Lovell, Franzen, Smith, & Townsend, 1997). A Massachusetts study found that some 82% of individuals involved in motor vehicle accidents and who consequently suffered TBI, were not wearing seat belts. Furthermore, alcohol was found to be a frequent contributor to those accidents. One epidemiological survey found that 25% of patients with TBI reported previous treatment for alcohol abuse (Morse & Montgomery, 1992). Failure to use seatbelt restraints has been found to be associated with more

severe impairment on tests that are sensitive to frontal lobe dysfunction (Smith-Seemiller, Lovell, Smith, Markosian, & Townsend, 1997).

Profile of Individuals with TBI

Several characteristics that have been observed in TBI patients relate to educational level, socioeconomic status, and marital status. A University of Virginia survey revealed that 50% of people who sustained brain injuries had between 8-12 years of education, earned an income of less than \$10,000, were generally of a lower socioeconomic status, and tend to be single (Morse & Montgomery, 1992). There have been no comparable studies within the New Zealand population.

Within the profile of individuals with TBI in overseas studies, men outnumber women in a ratio of 2 or 3 to 1, and are generally aged between 15 and 24 (Abrams et al. 1993; Englander, Hall, Stimpsons, & Chaffin, 1992; Roessler, Schriener, & Price, 1992). Greenspan et al. (1996) reported that 63% of all TBI occur in teenagers and adults ranging in age from 15 to 64 years, thus encompassing the primary working population.

Post-Injury Changes Following TBI

It is generally understood that, with a few exceptions, when a neuron dies a new neuron will not grow to replace it. The assumption that other areas of the brain take over the function of the damaged areas is only valid in a limited sense. The commonplace notion of "recovery" is not strictly appropriate when applied to TBI. Unlike injuries and illnesses such as broken bones, or a viral infection, an individual rarely "recovers" from brain injury (Kay & Lezak, 1990).

The speed with which progress occurs, and function is regained, has been found to be influenced by age and previous health history. Prognosis tends to be most favourable for young, healthy adults (Russell & Smith 1961, cited in Gronwall & Sampson, 1974). Garoutte and Aird (1984) reported that persons over 50 years of age suffer more serious and longer lasting after-effects than younger adults.

Rappaport, Herrero-Backe, Rappaport, and Winterfield (1989) studied head injury outcome on 63 severe traumatic brain-injured victims up to ten years post

injury. Interviews were conducted to establish participants' current disability levels. Information on level of arousability, awareness, and responsiveness; cognitive ability for self-care activities; dependence on others because of physical and/or cognitive limitations; psychosocial adaptability involving memory, judgment, and other cognitive abilities was obtained using the 1987 revision of the Disability Rating (DR) scale. Their findings suggested that patients admitted to an intensive hospital rehabilitation programme 60 days or earlier post injury showed significantly greater long-term improvement, as indicated by their DR scale score, than those admitted later. Furthermore, the long-term outcome for those admitted earlier was better irrespective of the disability rating at time of hospitalization. The findings of this study reinforce the belief that early admission to an intensive rehabilitation programme has a significant positive effect on long-term outcomes for TBI victims.

Reports in current literature on TBI generally agree that brain injured individuals experience and exhibit cognitive, emotional, and behavioural problems to a greater or lesser extent depending on the severity of the injury, and the time post injury (Morse & Montgomery, 1992; Willer et al., 1991). Some of the most common physical complaints reported by people with mild TBI include pain, headaches, nausea, dizziness, double vision, and fatigue.

In view of the fact that damaged neurons cannot be replaced, the exact mechanism by which post-acute progress occurs remains unclear, although several theories have been proposed. Recovery of function may occur as swelling is reduced and tissue around the damaged area begins to heal, or as related tissue which was already associated with the same function, begins to recover. The role of synaptic reorganisation and axonal sprouting is uncertain. Another possibility is that the adoption of compensatory strategies, such as the use of note books or diaries, may also contribute to the overall recovery of function (Morse & Montgomery, 1992).

Cognitive Progress

The primary aetiology of cognitive impairment generally evidenced in TBI is diffused axonal injury (DAI) (Alexander, 1995). The reduced speed of neuronal

processing created by diffused axonal injury is usually manifested in slowed speed of thinking, analyzing, processing, and integrating information.

Damage to the orbito-frontal cortex is common following even minor traumatic brain injury. Although the medical consequences of such an injury can be relatively trivial, it can have potentially catastrophic outcomes on psychosocial competency, ability to maintain employment, and performing activities of daily living. These major problem areas have proven elusive to standard neuropsychological testing, and can coexist with high intelligent quotient (IQ) test scores (Varney & Menefee, 1993).

Cognitive dysfunctions can be divided into five broad categories as follows: (1) learning and memory; (2) attention and concentration; (3) executive functioning (for example, problem solving, planning, sequencing of information); (4) awareness; and (5) behavioural issues (Brantner, 1992). The negative impact of these problems on work life means that employment is often a long term challenge following TBI. Individuals who have suffered from mild brain injury often report having 'lost the edge' when they find that they are not able to perform certain tasks with the same ease as before their accident (Morse & Montgomery, 1992).

Described as a "constellation of symptoms", the nature of disability arising from TBI is multifactorial (Brown & Nell, 1992). Cognitive impairments are usually considered to be the most disabling sequelae of TBI as the domains most severely affected are memory, attention, and information processing speed and efficiency (Capruso & Levin, 1992).

Emotional and Behavioural Changes

Individuals with severe TBI typically manifest numerous complex and enduring problems or deficits (West, 1995). It is not uncommon for depression to occur at different times in the recovery period. This is often associated with "plateaus" in progress, and with occasions when patients begin to evaluate their progress relative to the abilities of others around them. Patients may not only display vegetative signs of depression, but they may also become suicidal (Morse & Montgomery, 1992).

According to a longitudinal study by Lezak and O'Brien (cited in Brown & Nell, 1992) problems with anxiety, depression, and social relationships, increased during

the first two years, but decreased in the following years. Other studies also found that TBI individuals had more cognitive and behavioural problems at follow up than at earlier assessments (Brooks, Mckinley, Symington, Beattie, & Campsie, 1987). Various studies report that behavioural states such as anger, agitation, and depression are present in approximately 50% or more of individuals after TBI (Levin & Grossman, 1978; Lezak 1987, cited in Morse & Montgomery, 1992; and Reyes, Bhattacharyya, & Heller, 1981, cited in Cifu et al., 1997). The samples in these studies were reported to be free of any premorbid psychiatric history. Peck et al. (1984, cited in Kreutzer, Wehman, Morton, & Stonnington, 1988) investigated factors most strongly related to vocational outcome. They found that 78%, out of a sample of 60 severely brain injured individuals, reported problems with depression post-injury.

In a survey intended to identify long-term issues related to functional recovery following brain injury, Jacobs (1988) noted problems of depression, fatigue, anxiety, and general tension in half the population surveyed. Difficulties such as emotional lability, mood changes, restlessness, and temper tantrums were present in approximately one third of all cases. Executive function deficits (e.g. problems with the planning, initiation, and sequencing) of behaviours are also reported and can cause people with TBI to be judged as lazy or lacking in motivation.

Recent studies have shown that improvements following TBI continue to be made three years post injury (Ponsford, Olver, Curran, & Ng, 1995; Willer et al., 1991) and, according to Morse and Montgomery (1992), when individuals are motivated improvement may never plateau. In fact, two major factors which most frequently affect TBI individuals' entry into the vocational rehabilitation process are motivation and attitude. Significant barriers to rehabilitation success can arise when unresolved issues to adjustment to disability work together with problems in motivation and attitude (Ninomiya et al. 1995). Nevertheless, even when individuals are highly motivated, premorbid levels of functioning in all areas of life may never be fully regained, and in most cases neither mildly, moderately, or severely injured groups attain full recovery post TBI (Brown & Nell, 1992).

The emotional and behavioural problems experienced by some individuals with TBI greatly reduce their chances of maintaining employment. This is because these

problems often manifest themselves in poor work habits, such as tardiness, lack of motivation, and aggression. The long-term psychosocial problems associated with TBI affect not only employment, but all areas of life, and injury severity alone cannot predict the emotional and financial burden on families (Smith, 1992).

Physical Progress

Following TBI, physical activities are also affected, so that the brain-injured person will take much longer to perform tasks as simple as eating or getting dressed (Gronwall, Wrightson, & Waddell, 1990). Temporary tissue dysfunction may occur as a result of intracranial pressure, bleeding, and hypoxia (Morse & Montgomery 1992). In these instances, healing may take days or even months, after which recovery of full function usually returns.

A very common aftereffect of TBI is fatigue. Not only will individuals with TBI tire more quickly after very minor physical activities, but they become tired doing what is normally relaxing, such as watching TV. Sleep, or a good nights rest, does not appear to solve the problem of fatigue, in that individuals with TBI may wake up refreshed, but their energy level deteriorates very quickly. There is no clear explanation for this occurrence, although there is a possibility that TBI may damage the part of the brain that controls the rhythm of sleeping and waking (Gronwall et al. 1990). Other common initial complaints could include forgetfulness, neck pain, headache, and dizziness (Alexander, 1990).

Persistent impairment of executive functions and speed of psychomotor processing are major factors associated with loss of social autonomy and inability to return to work long after a TBI (Mazaux, Masson, Levin, Alaoui, Maurette, & Barat, 1997). Some research findings suggest that cognitive and behavioural deficits may actually be more limiting than motor impairments (Willer et al., 1991). This may be due partly to the greater persistence of cognitive and behavioural deficits than of motor functions (Greenspan et al., 1996).

Following TBI the most dramatic improvement tends to occur in the early stages. This is followed by more gradual changes which can occur sporadically interspersed with periods of apparently little change (Kay & Lezak, 1990). Research findings

suggest that physical complaints tend to predominate soon after injury, whilst psychosocial complaints tend to predominate one year post injury (Webb et al., 1995; Smith, 1992).

The existing body of literature on TBI has contributed much to the understanding of long-term outcome and neuropsychologic impairments arising from traumatic brain injury. Still more research is required to address outstanding questions regarding functional capabilities, productivity, interpersonal relations, and the capacity to care for oneself independently at home (Sander, Kreutzer, Rosenthal, Delmonico, & Young, 1996). In many cases the extent of any long-term deficits are not revealed until the immediate consequences of the physical changes have been dealt with, and the individual attempts to resume a normal life. Data from the Kansas City Head Injury Survey indicate that the long-term needs of people who have experienced a traumatic brain injury will vary according to their levels of progress, dependencies, living situations, support systems, and resources. In addition, the services that are available will further shape a person's destiny (Beals, Mathews, Elkins & Jacobs, 1990).

Assessment of Outcome

Measurement of functional outcome is a complex problem because functional outcome can be defined using any number of different indicators including employment, physical independence, and cognitive abilities (Boake & High, 1996). Generally assessment measures of functional outcome from TBI can be identified as either unidimensional or multidimensional.

Unidimensional assessment scales such as the Disability Rating Scale (DRS) and Glasgow Outcome Scale (GOS), are designed to summarise many specific outcome indicators by a single score. On the other hand multidimensional measures consist of multiple rating scales, each designed to measure a different outcome dimension (e.g. the Craig Handicap Assessment and Reporting Technique, Boak & High, 1996). Boak and High (1996) suggest that multidimensional measures are needed to provide a comprehensive assessment of outcome from brain injury and that no single rating is likely to be adequate.

Neuropsychological Assessments

Neuropsychological tests produce reliable and valid assessments of cognitive dysfunction following TBI (Teasdale, Skovdahl Hansen, & Gade, 1997). However, neuropsychological testing can over- or underestimate real-life performances, and projecting real-world performance from test results alone may be misleading (Fraser & Baarslag-Benson, 1994). Although some significant correlations have been established between variables such as the Glasgow Coma Scale score, neuropsychological measures of psychomotor speed, and a range of other measures, each variable on its own usually accounts for, at most, 25% of the variance between groups categorised in terms of individual demographic, physiological, and neuropsychological variables (Ponsford et al., 1995).

A limitation of neuropsychological testing is that it is designed to measure specific components of cognitive functioning, such as memory, attention, and concentration, not ability to perform functional tasks. Unfortunately, in rehabilitation settings, neuropsychological testing, which has demonstrated only limited ecological and predictive validity, is often utilized as a tool to predict functional abilities (Cifu et al., 1992). For example, some gains and improvements made through use of compensatory strategies (e.g. the use of a diary to aid memory) will not necessarily manifest themselves in improved scores on classical neuropsychological tests (Ho & Bennett, 1997). Thus, cognitive improvements during rehabilitation, as measured by neuropsychological tests, may have little bearing on subsequent return to employment. Instead, positive employment outcomes may be influenced by other factors (Fabiano, Crewe, & Goran, 1995).

Assessment Instruments for TBI

Clearly return to work requires TBI individuals to have recovered cognitive and other skills to cope with the demands of employment. Table 1 provides a list of some useful tests for measuring cognitive and emotional changes following TBI.

The tests listed in Table 2 are often used in assessments of return to work following TBI. Tests other than those measuring cognitive and emotional changes that may also be used included the Functional Independence Measure, and the Disability

Rating Scale. Psychosocial measures used include the Sickness Impact Profile (SIP). All the tests listed above are time consuming to administer and require the expertise of trained neuropsychologists for the accurate interpretation of obtained scores. Both time and financial resource constraints operating for the present study eliminated the use of any of these tests. In addition, as previously mentioned, the present study is concerned with aspects of return to work following brain injury which would not be captured through administration of these tests. However, many of the individuals involved in the present study have already been assessed using one or more of the above-mentioned tests as part of the rehabilitation process they underwent. Clearly these tests, singularly or in combination, can provide valuable information on the state of readiness for return to work following TBI.

Deficits in executive functions are not necessarily related to injury severity, as measured by length of coma. Mildly injured individuals with frontal lobe damage will generally have some problems of executive functioning. Unfortunately, the formal and very structured nature of some psychological testing may not reveal certain cognitive problems such as initiation difficulties. Therefore, some people will often perform well and obtain good scores on extended neurological examinations (Kay & Lezak, 1990) but encounter real problems upon returning to work. Quite simply, some cognitive deficits could remain undetected until TBI individuals resume with normal life consisting of work, family, social and leisure activities. Information gathered from interviews with the clients, their families, significant others, and employers, is essential for the assessments of some cognitive dysfunction (Morse & Montgomery, 1992).

Table 1

Tests for measuring cognitive and emotional changes following TBI

Attention/concentration	Intelligence/reasoning
Cancellation Test	*Ravens Matrices
Continuous Performance Test	Shipley: Abstraction subtest
WMS-R Mental Control subtest	Language
Trails A and B	Boston Diagnostic Aphasia Exam (BDAE), including Complex Ideation Material and Cookie Theft subtests
WMS-R (Supplement): alphabet curves, alphabet rhymes	*Boston Naming Test
*Digit Span	Controlled Word Association Test (FAS)
*Visual Span (WMS-R)	Shipley Vocabulary subtest
*Arithmetic (WAIS-R)	**Wide Range Achievement Test - Revised (WRAT-R)
Wisconsin Card Sorting (WCST)	Spelling and Reading subtests
**Paced Auditory Serial Addition Test (PASAT)	Token Test
Attention Capacity Test (ACT)**	Mathematics
*Digital-Symbol (WAIS-R) Incidental Learning	
* Memory/learning	WRAT-R: Math subtest
**Wechsler Memory Scale - Revised	Boston Parietal Lobe Math Test
*Rey Auditory Verbal Learning Test (AVLT)	Stanford-Binet: Quantitative, Number Series, Equation Building subtests
*Rey-Osterreith Complex Figure: recall	Visuospatial abilities
Benton Visual Recognition Test	Cancellation Test
Randt Memory Test	WAIS-R: Block Design, Object Assembly subtests
(Booklet) Category Test	Line Bisection Test
Albert's Famous Faces	Rey-Osterreith Complex Figure: copy
Executive functions	Hooper Test of Visual Organization
*Controlled Word Association Test (FAS)	Porteus Mazes
*Ruff Figure Fluency Test	Boston Parietal Lobe Drawings Test
*Porteus Mazes	Motor
*WCST	Finger Tapping
*(Booklet) Category Test	**Luria Serial Hand Positions
Picture Arrangement (WAIS-R)	**Recurrent Series Writing (M's and N's; Multiple Loops)
Tinker Toy Test	Digit-Symbol (WAIS-R)
Executive Functions Behavioural Rating Scale	Grip Strength
Emotional/behavioural	Grooved Pegboard
Becks Depression Inventory	Tests of Apraxia
Minnesota Multiphasic Personality Inventory	Other
Portland Adaptability Inventory	Galveston orientation and Amnesia Test (GOAT)
	Neurobehavioural Cognitive Status Exam

Notes to Table 1:

* Particularly sensitive to mild TBI problems

** To be included in evaluating mild TBI patients

Social Support as Predictor of Outcome

Social supports are generally understood as a class of external coping resources that are made available through the larger social network in which the individual is embedded (Gore, 1992). The influence of social support on stress has been well researched and there is some evidence that social support influences long-term outcome in a variety of rehabilitation client groups (Kaplan, 1990).

As discussed earlier, people with mild brain injuries are least likely to receive formal rehabilitation. This also means that their families are unlikely to have had any contact with specially trained mental health practitioners. With little information about the sequelae of brain trauma, these families do not know what to expect and are at risk for maladaptive emotional reactions (Bock, 1997). Put simply, lack of understanding limits their capacity to provide positive and appropriate support to their injured family member. This problem may have negative consequences on post-injury progress as the TBI individual struggles alone to deal with his or her inability to cope.

A study by Leach, Frank, Bouman, and Farmer (1994) obtained a significant negative correlation between the family's coping ability and the injured individual's level of depression. In addition, evidence suggests that a person who is depressed may interact with the environment in a manner that erodes even those resources for support that are available. Since depression is often an outcome of TBI, findings such as this underline the importance of providing families with information about the consequences of TBI, with particular emphasis on behavioural and emotional disturbances, in order that they might be better prepared to cope with such problems (Junque, Bruna, & Mataro, 1997).

The study by Kaplan (1990) revealed that levels of emotional distress were related to both social support and vocational outcomes in a sample of TBI individuals. In that study, clients that experienced stronger social support showed less emotional distress, and a greater likelihood of positive vocational outcome. Greenspan et al. (1996) also found that married participants were more likely to have returned to work one year post injury than those who were unmarried.

Webb et al. (1995) carried out a study on quality of life for persons with TBI two years post injury. A path analysis revealed that family support affected quality of life

indirectly through four pathways. In three of them the effect of social support was mediated by residual impairments. Greater family support led to improved functional independence and, hence, an improved quality of life. The authors stated that: “TBI survivors with strong family support had fewer impairments, which (1) directly improved quality of life, (2) improved quality of life indirectly through increased likelihood of employment, or (3) improved quality of life indirectly by reducing the need for rehabilitation and improving functional independence two years after discharge”.

Social support is a multidimensional construct with emotional, cognitive, and instrumental or tangible components. Further research is required to address questions such as; if social support is beneficial, which particular type of support appears to have high positive correlations with vocational outcome?

Undoubtedly, individuals with TBI are at increased risk of unemployment due to some combination of factors such as cognitive deficits, premorbid demographics, physical disabilities, and age.

Summary

This chapter provided a broad overview of traumatic brain injury including description, epidemiology, post-injury deficits, and neuropsychological predictors of outcome.

The findings documented here underline a number of important points relevant to the purpose of the present study. Firstly, TBI tends to affect the primary working population. Whilst finding first time employment, or returning to some form of employment after a brain injury is a high priority goal, the process is often fraught with problems. This will be discussed further in the next chapter. Secondly, the size of the TBI population continues to increase because sophisticated medical procedures reduce the number of fatalities. Taken together these factors imply that there is a need to develop appropriate and adequate guidelines for treatment, services, and care, specific to this population. Some of these guidelines may highlight the need for legislative change. Certainly there appears to be an increase in the demand for specialised rehabilitation services, because traditional methods have not been found to

be entirely effective. Thirdly, it was emphasised earlier that although traumatic brain injury happens to a family, it does not end with the family. The protracted cost of rehabilitation, and long-term government assisted income, such as unemployment and sickness benefit, taxes the resources of society as a whole. In order to minimise the financial and emotional burdens on everyone concerned, it is important to ensure that people with TBI are assisted in every way to achieve a degree of independence and a satisfactory quality of life.

The long-term difficulties associated with TBI are legion. Many of them pose serious barriers to employment. The next chapter will consider predictors of return to work, rates of return to work, and post-injury vocational rehabilitation.

CHAPTER TWO

Return to Work Following Traumatic Brain Injury

Predictors of Vocational Outcome

Employment following TBI has been a popular focus of study. The handicapping effects of the cognitive deficits outlined in the previous chapter are often manifested in daily-life functioning, and this is likely to impact most strongly on the person's employability (Teasdale, Skovdale Hansen, & Gade, 1997). Because, in societies where work is central to one's identity, it affords financial independence, status within the community, and a sense of personal worth, employment status after injury is of crucial importance to TBI survivors and their families (Brooks et al., 1987; Dikmen, Temkin, Machamer, Holubkov, Fraser, & Winn, 1994). Furthermore, employment has been shown to be the strongest contributor to improved quality of life following TBI (Webb et al., 1995).

Predictors of return to work have included pre-injury, injury, and post-injury factors. Some of the most commonly cited are: age, education, emotional and behavioural status, injury severity, cognitive deficits, and physical disability, (Cifu et al., 1997; Dikmen et al., 1994; Ip, Dornan, & Schentag, 1995; West, 1995). Based on consensual agreement between rehabilitation team members, Fraser et al. (1990, cited in Fraser & Baarslag-Benson, 1994) identified the most salient barriers to employment as cognitive deficits, followed by emotional concerns, and physical impairments.

Injury Severity

Early studies suggested that most individuals will return to work following even fairly severe brain injury (Maciver et al., 1958; cited in McMordie et al., 1990). However, more recent studies suggest that individuals who have sustained severe brain injuries are likely to face life without work. Fabiano et al. (1995) made the bleak statement that return to work following severe brain injury is an ambitious endeavour. In a study by Thomsen (cited in Jacobs, 1988) only 8% of 50 patients returned to their former jobs, 72% were reported not able to work at all, even in a

sheltered work environment. A study by Dikmen et al. (1994) found that only a very small percentage of severely injured were employed 18 months to 2 years post injury, whereas those with moderate and mild TBI tend to return to work within the first 6 months after their injuries.

Severity of injury (as measured by scores on the GCS) has been identified as a factor in determining failure to return to work by many studies. In a cohort study, with 1 to 2 years follow-up, involving a total of 461 TBI subjects, Dikmen et al. (1994) found that return to work occurred throughout a two year period. The highest rate of return occurred between one and six months after injury. Mildly and moderately injured individuals returned sooner, whilst only a very small percentage of the most severely injured cases returned to work between 18 months and 2 years post-injury.

Individuals with mild head injury do sometimes return to work within a short time. They are motivated to do so because they feel well enough, but not necessarily because their work performance has been favourably assessed. Under the light demands of daily living outside of work, cognitive capacities are not sufficiently challenged to reveal limitations that may ultimately affect work performance. All 66 patients with minor brain injury studied by Wrightson and Gronwall (1980) returned to work after a mean time off work of 4.7 days. However, they all found capacity for work and other activities impaired to some degree. This may be related to the rate at which information can be processed by the brain, a capacity that has been shown to be reduced after mild head injury. It is worth noting that patients who return to work early tend to report more symptoms such as fatigue, irritability, headaches, and memory and concentration problems, than those who returned later. This is likely to have occurred because too much was asked of the workers when their capacity was still considerably reduced. The findings of Wrightson and Gronwall suggest that there may be an optimum time for mildly injured patients to return to work.

A study by Greenspan et al. (1996) suggests that injury severity per se does not influence return to work. Instead, return to work may be influenced by the relationship between injury severity and functional independence. Regardless of TBI

severity, study participants who reported functional limitations at one year post injury were the ones who failed to return to work.

Webb et al. (1995) found that change in functional independence during the second year after injury appeared to have little, if any, long-term effect on employment. However, functional independence at 12 months was found to have a significant direct effect on employment. Cifu et al. (1992) also found that severity of physical and cognitive functional deficits at rehabilitation admission strongly correlated with return to work one year post injury. A possible explanation is that returning to work too soon following injury, before healing and adjustment have begun, increases the chance of failure. It is not unrealistic to expect that one year post injury, physical and cognitive functions may still be greatly impaired.

A prospective study carried out by Ponsford et al (1995) found that scores on the Disability Rating Scale (DRS), the Glasgow Coma Scale, and age, correlated with employment status. These three factors correctly identified 74% of the sample as either employed or unemployed. A cross validation study correctly classified 68% of the sample's employment status. Cifu et al. (1992) also examined a group of employed and unemployed TBI survivors and reported that neuropsychological testing in the acute phase did not predict work outcome at one year post injury. One explanation for this is that patients must achieve a minimum threshold of functioning to complete neuropsychological testing successfully. This 'basement effect' screens out the most severely cognitively impaired.

As mentioned earlier, neuropsychological tests have only limited ecological validity. People and their abilities can change over time. Thus individuals who perform poorly on such tests in the acute phase may have learned various compensatory strategies by one year post-injury. Being able to use a diary to aid poor memory, or having a structured work environment and/or truncated work hours to address attention and concentration deficits, may increase employment success. Neuropsychological tests are important for vocational planning insofar as they can provide information identifying which specific cognitive abilities are impaired.

Cognitive Deficits, Personality, and Psychiatric Changes Post-Injury

Although some studies stress the importance of motor deficits on failure to return to work, others, as already mentioned, suggest that cognitive deficits and personality changes may have a greater impact than physical impairments on return to work. Emotional and behavioural sequelae observed in most TBI individuals consist of depression, lack of initiation or motivation, difficulty in regulation of emotions, impulsivity and disinhibition, unawareness of problems or denial, insensitivity and unconcern for others (Morse & Montgomery, 1992). In most cases job success tends to hinge on the ability of a worker to interact appropriately with others, be they customers, colleagues, or employers. It is to be expected that emotional and behavioural problems are often the most significant barriers to successful return to work following TBI.

Mazaux et al. (1997) found that persistent impairments of executive functions and speed of psychomotor processing are major factors associated with loss of social autonomy and inability to return to work, long after TBI in adults. Haffey and Lewis (1989) also cite psychomotor and cognitive processing slowness, cognitive-communicative disorders, emotional and social behavioural control problems, and inept or inadequate interpersonal social skills, as primary barriers to employment. Some TBI individuals may possess adequate cognitive capabilities to work, and do not suffer from any significant motor impairments. However, behavioural problems such as aggression, and deficient social skills, could prevent them from being successfully employed post injury. Improving these impairment in concrete social situations represents a major challenge for rehabilitation professionals.

The result of a survey of Los Angeles employers found that the majority of employers regarded good work habits and positive attitudes as crucial to an employee's success on the job. These attributes were defined as "following the rules and working hard". Successful entry-level employees were identified as those who were hard-working and reliable, rather than those with special skills (Wilms, 1984).

Whilst some individuals with TBI may meet all of the above criteria, they could still be disadvantaged in securing long-term employment because of cognitive and motor problems. An individual with poor physical coordination and slowed reaction

times may be passed over for someone who would be able to perform the job faster. Furthermore, it is unfortunate that in the intervening 15 years since Wilms' study, there has been a general decline in the amount of unskilled work available in developed countries. This has greatly reduced the options for paid employment of people with severe TBI, in that the introduction of modern technology, such as computers, has made certain manual tasks, for example filing, obsolete.

Many individuals with TBI were previously employed workers, and the majority of them have not had to live with a disability all their lives (Abrams et al., 1993). Individuals with TBI who manage to return to competitive employment are likely to find themselves taking lower ranked positions, being re-employed in modifications of pre-injury jobs, or acquiring completely different jobs because of persisting injury-related deficits (Preston, Ulicny, & Evans, 1992). Having to adjust to a new level of functioning that may require assistance can have a powerful impact on the individual's emotional functioning and self esteem (Abrams et al.).

An earlier study by Melamed et al. (Melamed et al., 1983, cited in Melamed, Grosswasser, & Stern, 1992) indicated that work involvement was primarily influenced by the severity of psychiatric dysfunctions such as thought disorders, affective disorders, personality disorders, and behavioural disturbances. The ability to perform job-related tasks is obviously an important criteria for employment. However, employers also stress the need for high levels of social skill such as the ability to get along with colleagues and be a part of a team.

A more recent study by Melamed et al (1992) involving a sample of fully ambulated TBI patients with no significant motor disability found that some patients with psychiatric symptoms such as aggression, impulsiveness, and passivity were unemployed, although they possessed suitable cognitive capacities for work. These findings suggest that the degree of psychiatric dysfunction following TBI may have a greater influence in subsequent work involvement than either motor or cognitive disabilities.

Age

The findings of several studies indicate that TBI survivors over the age of 45 are less likely to return to employment than younger individuals (Brooks, et al., 1987). A meta-analysis of 41 post-injury employment studies by Crepeau and Scherzer (1993, cited in Sander et al., 1996) reported that age was a significant predictor only in studies that included persons over the age of 60. A study involving 134 TBI patients by Brooks et al (1987) found no evidence of any differential age effect in return to work for cases under the age of 45. However, they reported that the chances of returning to work reduced dramatically from 39% for 82 cases aged 45 or less, to 12% for 52 cases aged over 45.

The rate of employed TBI survivors over the age of 40 may also be influenced by factors such as personal career aspirations and job availability. To some extent it may be a reflection of the age distribution among the unemployed in the non-disabled population and/or the reluctance of employers to take on cognitively and functionally challenged persons who may have a relatively limited work life (Brooks et al., 1987; Haffey & Lewis, 1989).

Premorbid Factors

Return to work may also be influenced by factors such as premorbid work history and the availability of a social support network system before and after injury. Individuals with socioeconomic disadvantages have been found to have a higher likelihood of unemployment before and after a head injury (Skord & Miranti, 1994). Individuals with lower socioeconomic status who were unemployed before their brain injuries may not have developed the necessary skills to obtain or maintain a job. It is likely that the difficulties associated with TBI increase the chances of unemployment for this group after a brain injury compared to more highly trained individuals. Furthermore, socioeconomic disadvantages may limit the type and extent of rehabilitation that is received, creating further barriers to post-injury employment.

Several studies have found relationships between brain injury, criminal behaviour, and substance abuse. Kreutzer et al. (1995) found that relative to the uninjured population, people with TBI have a high incidence of heavy drinking, both

pre- and post-injury. Both criminal behaviour and drug or alcohol abuse is likely to put individuals in at-risk situations as far as brain injury is concerned, hence their significant representation among cases of TBI. A history of alcohol or substance abuse is likely to have influenced pre-injury employment. The importance of addressing this issue, and setting up appropriate post-injury intervention programmes is fundamental to the success of return to work for some TBI individuals.

Some younger TBI victims may not have worked before their accidents. Thus they have not developed the requisite skills and abilities necessary for successful employment. For that population, Kaplan (1988) suggest that “habilitation” rather than rehabilitation would be more appropriate. Teaching of vocational skills needs to include the basic steps towards obtaining a job, for example preparing for an interview.

Interactions Between Job and Personal Characteristics

Employment outcome has also been found to be influenced by the type and characteristics of the job being sought. Brain injured individuals who return to the same employer were reported to be more likely to be employed and earn a better hourly wage than those who found employment with a different employer post injury (Fabiano et al., 1995). Successful employment outcomes tend to be associated with employers and supervisors who possess certain qualities. These qualities include a willingness to give individuals a chance, and to communicate with vocational counsellors in order to understand the strengths and limitations of their employees. Employers who are flexible in their expectations of employees also have a positive effect in return to work (Kay & Lezak, 1990). An interesting finding in a study carried out by Fraser et al. (1988) was that individuals who were employed in structural occupations, such as carpentry, seem less affected by their injury. A possible explanation for this is that some structural jobs can be performed at a gradual pace and often do not demand great amounts of interpersonal interaction.

Obviously job performance depends on the skills, knowledge, abilities, and attitudes of the individual. However, a number of other factors unrelated to the individual’s personal characteristics could also influence return to work. Successful

return to work may also be influenced by aspects of the work environment. A growing awareness of equal employment opportunities (EEO) policies means that people with physical disabilities need not necessarily be disadvantaged in obtaining employment. For instance, in most modern buildings, wheelchair access is now the rule rather than the exception. Additionally, office equipment designed for the special needs of individual workers is now more readily available.

The expectation that TBI survivors will have a normal life span presages the need for life long services (Roessler et al., 1992). The large burden imposed on families, and society as a whole, in dealing with the long term effects of TBI is well researched (Ip et al., 1995; Stambrook, et al., 1990). The outcomes of several studies indicate that marital relationships may be affected by the outcome of brain injury (Stambrook et al., 1990). Because, on average, men continue to earn more than women, families affected by the head injury of a husband or father are likely to experience a more significant loss of income than when a wife or mother is injured (Willer et al., 1991).

The challenges faced by service providers concerned with the return of TBI individuals to gainful employment is enormous. TBI individuals are among the most difficult group to work with. Post-injury progress can be frustratingly slow, and deficits such as the clients' lack of awareness and non acceptance of their disabilities can hinder the formulation of realistic vocational goals. Furthermore, environmental factors such as the current economic climate, and ensuing fluctuations in employment rates, may increase the competition for any particular job.

Definition and Rates of Return To Work

A major issue to be addressed in research on return to work is the question of an appropriate operational definition for successful employment outcome. Some studies take employment at any time post injury without taking into account employment stability and duration. Actually obtaining a job may be easier than securing ongoing support in the work place, or retaining the job on a long-term basis (Dikmen et al., 1994). The assessment of vocational success should include the securing of a job and the ability to maintain a position on a consistent basis within the work force (Cifu, et al., 1997).

Unfortunately, differences in patient demographics, injury severity, provision of rehabilitation services, verification of work performance status, the nature of any work assistance programme, and the presence or absence of long term follow-up, make between-studies comparisons difficult.

As mentioned earlier, recovery from TBI has been shown to continue over a period of at least 3 years. Thus, a realistic picture of long-term employment outcome could only be obtained over a period of at least the same number of years, and in this sense longitudinal studies may provide the most accurate picture of the employment status of people with TBI. In actual fact, the time required for job performance to return to pre-injury levels is likely to depend on many things, including the type of work as well as the type and extent of brain injury sustained by the individual (Englander, et al., 1992). As can be expected, in cases of severe TBI, job performance may never return to pre-injury levels, since realistically individuals may not be able to return to the type of work they had pre-injury.

A review of the existing literature indicates considerable variability in reported employment rates after traumatic brain injury (Fabiano & Crewe, 1995). This stems, in part, from methodological issues in return to work studies, for example differences in the definition of outcome, and the selection of predictor measures (Sander et al., 1996; Dikmen et al., 1994). Other factors that may influence the variability of the reports include: sampling differences, inclusion criteria with respect to severity of injury, non head injury factors (for example premorbid work history), and the time post injury in which the study is completed. Definitions of employment have included a mix of full- and part-time work and academic study.

Reports on rates of return to work following TBI range from 0% - 100% and, as would be expected, appear to be influenced by injury severity. Because of methodological differences in terms of definition of severity, estimates of employment following TBI are highly variable. For severe TBI some studies estimated the rate to be between 0%-14%, while estimates for return to work for moderate to mild TBI tend to be higher (Fabiano, et al., 1995). Based on the rates of return to work reported by several studies where the samples had not received formal rehabilitation, Haffey and Lewis (1989) suggest that the baseline for return to work following severe TBI is 23-

30%. They defined occupational outcomes as full- or part-time engagement in competitive employment, self-employment, supported work, sheltered work, paid on-the-job training, and nonpaid work trial.

Brooks et al (1987) reported that 85% of their sample of 134 were employed pre-injury. By contrast, 29% were employed post-injury. The study conducted by McMordie and others (1990) on a sample of mixed aetiology with a range of TBI severity, found comparably poor rates of return to work. From a sample of 177, only 19% were reported to be in competitive employment post-injury. Rates of return to work from some recent studies are summarised in Table 2.

Table 2

Summary of studies on return to work for persons with TBI

Authors	<i>N</i>	Severity	Employed post-injury
Peck et al., 1984	60	Severe	48%
Brooks et al., 1987	134	Severe	29%
Fraser et al., 1988	48	Mild, Moderate, Severe	73%
McMordie et al., 1990	177	Mild, Moderate, Severe	19%
Melamed et al., 1991	67	Severe	49%
Englander et al., 1992	77	Mild	88%
Godfrey et al. 1993	59	Severe	75%

Because of physical, personal, and psychological problems, TBI survivors may be more prone to moving in and out of employment than non-injured individuals. The

study by Fraser et al (1988) involved a total of 102 individuals out of which only 48 were working at the time of their injury. They reported that 35 out of the 48 returned to some sort of employment one year post injury. However, many of the 35 often had interruptions in their employment, with 25 reported to have worked 1 to 12 months of the year. The study by Englander et al. (1992) on individuals with mild TBI also reported a relatively high rate of return to work. Of the 88% that did return to work, however, 16% did so with some continuing symptoms. Of the 48% that returned to work in the study by Peck et al. (1984, cited in Kreutzer et al., 1988), only 13% had returned to pre-injury vocational levels. Thirty-five per cent were employed in less demanding or sheltered workshop settings. Godfrey, Bishara, and Partridge (1993) combined study and work and found that 58 % returned full time while 17% returned to work under special conditions. Melamed et al (1991) reported a return to work rate of 49%. However, the definition of employment in their study was broad compared to the definitions used in the other studies mentioned above. Their definition of employment included the categories: full and part-time employed in the open market; employed in the open market, but under protected conditions; full-time student; functions fully as a housewife; or functions satisfactorily as a housewife.

Giving consideration only to the percentage of TBI people employed at any given point in time will provide a distorted view of that population's overall employment adjustment. Far from being stable, employment rates post injury have been found to be dynamic (Sander et al., 1996). The study by Sander and colleagues found that the percentage of employed persons declined after the first follow-up, reaching an overall low at 24 months post injury. By contrast other studies, for example Brooks and colleagues (1987), and Dikmen and colleagues (1994), report employment rates to be relatively stable between the first and second years post-injury.

Because of the lack of a universal definition of return to work, it is difficult to draw a clear picture of the rates of return to work following TBI. Given the long-term effects of TBI, using the traditional definition of work to encompass only paid employment may not be appropriate for research focusing on this area. As previously discussed, for some TBI individuals quality of life may be improved by engagement in occupations or activities that are unpaid.

Vocational Rehabilitation Following TBI

The decline in death rate from brain injury, and the relatively normal life expectancy of TBI individuals, have placed increased responsibilities on rehabilitation providers who assist such individuals to resume life as productive members of society. Traumatically brain injured people do not form a homogeneous population. While the severity of injury plays a major role in predicting outcome, long-term adjustment may also hinge on factors such as social support, motivation, and pre-morbid history. Such complexities mean that rehabilitation professionals face a formidable challenge in predicting outcome following TBI (Ip et al., 1995).

Return to some form of employment following brain injury is typically a high priority for survivors and their families (Teasdale et al., 1997). Although the likelihood of returning to full-time paid work is minimal for very severely injured people, they will still desire to lead productive lives (Gronwall et al., 1990). A major focus of many rehabilitation programmes is to return individuals to a state of productive living. However, return to work is a primary direct target of some rehabilitation procedures (Abrams, et al., 1993; Teasdale et al., 1997).

Clearly, vocational rehabilitation for people with TBI need to take into account many factors, not just those pertaining to injury and post injury statuses. For instance, persons with moderate to severe TBI who had a poor employment history, due to poor social or interpersonal skills, are at high risk of vocational failure post injury. Expectations for successful job placement and retention for persons with TBI must be realistic. Setting too ambitious a goal may result in failure in returning a person to work.

Vocational counsellors working with TBI clients are faced with multiple challenges. Spivack and Balicki (1990) identified four areas in which these challenges occur. These are summarised below.

- 1). The rehabilitation needs of people with TBI differ from those of people with mental retardation or strokes. There is a lack of training and education in TBI for vocational rehabilitation counsellors; as well as a lack of perceived administrative support; and problems associated with regulations which are not specific to TBI. Appropriate training and education on the multiple functional loss caused by TBI

would give vocational counsellors skill and confidence in working with this often very challenging group.

- 2). The rehabilitation needs of people with TBI are generally attended to by several different therapists at different stages of recovery. This could result in incomplete or poor documentation and evaluation of clients medical and rehabilitation history. In addition, some individuals may be several months or even years post injury before they begin work with vocational counsellors. It is important that all relevant information is retained in an accessible form in order to provide the information necessary for the development of effective individual rehabilitation programmes.
- 3). Lack of opportunities in prevocational and vocational training programmes, which continue to operate out of traditional models focusing on populations with mental retardation, mental illness, and physical disabilities. As previously mentioned, TBI individuals have particular vocational needs. There is a need for facilities that will identify and provide services specific to their needs.
- 4). Lack of community support systems providing training in daily living skills, and lack of community re-entry training opportunities to transitional and independent living. The long-term success of vocational rehabilitation programmes may hinge on the availability of community facilities and organisations where TBI individuals can be trained, can practice, and can maintain skills without having to deal with the pressures of being in a competitive work environment. The availability of community support systems by way of trained care givers and accessible transportation is also important for long term success and also serves to alleviate the pressure on family members as primary caregivers.

Research has contributed to public awareness of the particular needs of TBI patients, so that today there are specialised brain injury rehabilitation facilities offering comprehensive services specific to TBI. However, the running such facilities and services requires considerable financial support. Lengthy periods of rehabilitation for individuals with serious deficits may be beyond the resources of either individual patients or health funding bodies. It is important, therefore, to evaluate vocational

rehabilitation programmes to ensure that they are meeting clients' needs as effectively as possible.

Rehabilitation professionals are responsible for setting vocational rehabilitation priorities for people with brain injuries and the knowledge and expertise they provide are undoubtedly valuable. However, in working towards a positive long-term outcome, it is also important to consider the survivor's point of view (Roessler, et al., 1992). What is considered to be a good and acceptable quality of life depends on the expectations each individual has. Some TBI survivors do not return to competitive employment. They may choose instead to become involved in other productive activities such as homemaking, volunteer work, and academic pursuits. Thus, competitive employment may not always be a practical or preferred goal following TBI (Sander et al., 1996).

When setting priorities for vocational rehabilitation for those with brain injuries, it may be helpful to consider "occupations" instead of "employment goals". As pointed out by Gronwall et al. (1990) many women also fill the role of home-makers. Although it is often not recognised as such, managing a household is, in one sense, as much an occupation as paid employment. In situations where paid employment is not a realistic option there are many ways in which a person may be "productively occupied". Thus rehabilitation professionals could assist their clients to explore various occupational options in order to set a realistic goal.

A pilot investigation of problems and coping strategies of TBI individuals and their spouses was carried out by Willer et al. (1991). The loss of employment was rated highly as a concern by both the men and women with TBI. The men reported that finding regular daytime activity, whether paid or unpaid, made them feel productive. Further studies focusing on job satisfaction and perceived quality of life of TBI individuals involved in productive activities other than competitive employment, may be necessary.

Vocational Rehabilitation Programmes

Until the '70s the rehabilitation needs of people with TBI were not differentiated from those of people with mental retardation or who had suffered strokes. Gronwall

et al. (1990) stated that “the traumatically and congenitally disabled have little in common except the disability”. People with TBI were able to participate in many activities until their accident reduced their capacity to cope, or the resulting disabilities prevented participation in some activities altogether. People with TBI generally retain their interests even though they may not be able to participate in certain activities. In addition, unlike individuals with retardation, TBI victims have often had prior competitive employment experience. Despite severe injury prior work skills are often preserved to some extent. Existing skills can facilitate learning a new job as well as maintaining performance (Kreutzer et al. 1988).

Although there have been tremendous improvements in the health sciences, and medical technology has significantly improved the physical restoration of many traumatically brain injured persons, psychosocial, educational, and vocational rehabilitative services have unfortunately not kept pace (Wehman, Kreutzer, Wood, Morton, & Sherron, 1988). Subsequent research has certainly contributed to awareness of the special needs of TBI patients, and today there are brain injury rehabilitation facilities offering services specific to TBI. The running of such facilities and services requires a considerable financial resource. Individuals with serious deficits generally require longer periods of rehabilitation, and are more likely to need ongoing care, than those less severely injured (Whitaker, 1988). The extent, and even quality, of rehabilitation services available to individuals may depend on their personal financial resources.

Research to demonstrate the efficacy of TBI rehabilitation is important especially at a time when cost-containment efforts are intensifying (Davis, Fardanesh, Rubner, Wanlass, & McDonald, 1997). The value of many existing vocational rehabilitation programmes is uncertain, and there is relatively little long-term outcome data to help guide rational programmed development (Devany, Kreutzer, Halberstadt, & West, 1991).

Some of the vocational rehabilitation programmes implemented to assist people with TBI have included sheltered training and supported employment, job-site training and support, transitional job coaching, and advocacy programmes. These programmes

are not mutually exclusive. For instance, a Supported Employment Programme may include both job-site training and advocacy among its components.

Sheltered training programmes are traditional methods of vocational rehabilitation. There tends to be little consideration for issues such as person job match, skills assessments, and development of long-term employment goals. This model was developed specifically to address the needs of the developmentally disabled. However, it is argued that the needs of brain injured individuals differ from those of developmentally disabled persons not least because, as already discussed, many TBI individuals were employed workers before their accidents. Moreover, sheltered training programmes have been criticised as inconsistent with the principles of integrated employment, consumer empowerment, and interdependence.

More consistent with those principles is the supported employment approach, which follow job placement with job-site training and support. This approach is defined as “paid work in a variety of settings, particularly regular work sites, especially designed for handicapped individuals; (1) for whom competitive employment has not traditionally occurred, and (2) who, because of their disability, need intensive ongoing support to perform in a work setting (Kreutzer et al. 1988). However, for individuals with significant brain injury, the supported employment programme may not be sufficient to ensure successful employment (Abrams et al., 1993).

Placement decisions for individuals with TBI should involve consideration of the following issues: The type of work the individual has done before and after their injury, the type of work they are interested in doing, their existing skills, and their potential for learning new skill on the job (Kreutzer et al. 1988). Wehman et al. (1988) suggested that an individualized approach to employment seems better suited to the vocational needs of TBI survivors than sheltered training programmes. The Work Reentry Programme at Sharp Memorial Rehabilitation Centre in San Diego, is one that utilises a highly individualised process aimed a re-employment. Its primary focus is finding the least restrictive employment environment that matches the individual’s interests, skills, and abilities.

The cost effectiveness for 142 TBI individuals, of the Work Reentry Programme mentioned above, was studied by Abrams et al. (1993). The findings reported that the programme, devised explicitly to improve the vocational outcomes of persons with TBI, was of substantial value. Most of these clients were employed before their injuries. The study reported an impressive 75% placement rate. However, no follow-up study to establish employment stability was carried out. The philosophy of the Work Reentry Programme is that there is more than one “blueprint” for return to work for TBI individuals. Its success placing TBI individuals in post-injury employment may lie in the fact that it recognizes the apparently individualistic nature of brain injury and addresses this by “tailoring” the programme for each client.

Cognitive deficits are well accepted as a barrier to employment. However, the effects of social support, self perceptions of perceived barriers, and satisfaction with employment on a long-term basis, is not so well researched (Fraser & Baarslag-Benson, 1994). For individuals with severe TBI, job retention is a difficult and complex problem. It is often wrought with emotional, social, and psychiatric adjustment issues such as suicidal and excessive drinking tendencies. Much more research is required to explore the ways in which success rate may be increased for this challenging group.

Summary

The literature reviewed for this chapter suggests that it is difficult to make predictions about post-injury employment. The challenges faced by rehabilitation professionals are enormous. Return to work is a process that requires a multidisciplinary approach, and vocational rehabilitation should begin right from the outset when an individual is first admitted into acute care.

Each therapist, working with a client at a different level of progress, gathers vital information on functional abilities and state of readiness to progress further. This information must be documented and information must be made accessible for other professionals working with the same client. With regard to return to work, vocational rehabilitation professionals are not simply responsible for placing TBI individuals in employment, they must also ensure that a good long-term outcome is achieved. It is

necessary to assess clients' attitudes, skills, knowledge, and abilities in order to be able to create a good person-job match, and to achieve a good long-term outcome. One of the ways in which a comprehensive profile of a client can be obtained is to include feedback, not only from other professionals, but also from the clients' families, employers, and clients themselves.

Published studies also indicate that there is no single vocational programme that can be identified as most effective for people with TBI. Successful return to work is influenced by many variables including premorbid factors, injury severity, social support, post-injury job characteristics, and environmental factors, including available occupational placements, modification of the physical work environment, employer attitudes, transportation, and funding.

In the light of these observations, the following section explains the rationale for the current study.

Rationale For The Present Study

The impetus for this research was firstly a dearth of studies carried out on the employment of people with TBI in New Zealand, and secondly the fact that few studies have focused on job satisfaction, job performance and their relationship with factors such as social support, and whether an individual returns to part- or full-time work.

As already discussed, an important post-injury goal for many TBI individuals and their families is a return to competitive employment. A review of the literature revealed that successful return to work is often a complicated process that is influenced by many factors. To date there is no evidence that a specific vocational rehabilitation model is best for ensuring successful return to work for this population. Several studies concluded, however, that individualized vocational programmes are most appropriate. The formulation of such programmes necessitates consideration of clients' premorbid history, and accident related variables such as severity of injury, in addition to post accident information.

For individuals with severe TBI, returning to a premorbid occupation may not be an option. However, returning to some form of productive occupation may not necessarily be out of the question. Mildly brain injured people may also encounter difficulties in post-injury employment that could result in their moving frequently from one job to another. In light of these issues, it is important to assist individuals with TBI to explore the occupational options that would best match their particular level of skill and ability. Identification of the factors that relate to job satisfaction could facilitate the development of appropriate and effective vocational rehabilitation programmes.

The type of work an individual returns to, and aspects of the work environment are undoubtedly of importance in long-term employment outcomes. Employers and employees who have an understanding of TBI and the needs of individual clients in the work place should be better able to provide support for their colleagues. There appears to be a need to establish what employers and prospective employers of TBI individuals know about brain injury and whether they would appreciate any further education and information on this subject.

The research methods used for this exploratory study are mainly qualitative. The research questions guiding it are concerned with an exploration of the experiences of people with TBI on issues of employment. The main aim of the study is to examine pre-accident and post-accident employment status, and reported job satisfaction, job performance, and the importance of being employed, in a group of New Zealand individuals with TBI. Some formal analyses will be performed in order to explore relationships among various factors. It is hoped that the study will provide useful information to guide further research on job satisfaction, social support, and return to work following TBI.

The survey method was chosen for the study, and the collection of data was by means of self-administering questionnaires. Since the questions asked usually focused on real-life situations, the external validity of a survey is expected to be high. With the understanding that causation cannot be inferred from correlational analyses alone, the internal validity of surveys is generally good (Lehman, 1991). Given the tendencies of TBI individuals to have difficulties with concentration and memory, their self reports may not always be accurate in the objective sense. However, subjective experiences can influence both the level of stress experienced by individuals, and their motivation to seek help (Smith,1992). Such reports, therefore, provide useful information to those involved with the rehabilitation of brain injured people.

In the present study participants' consent was sought for the completion of an additional questionnaire on the part of their employer. The main purpose of this latter questionnaire was to confirm the employment status of participants, and to gather information on the general needs and concerns of employers of people with TBI.

Definition of Concepts

Job Satisfaction

Job satisfaction is a complex concept and difficult to measure objectively. The complexity of human behaviour makes it difficult to know exactly what each person requires to be happy and successful in a job. The extent to which individuals are

motivated to achieve, and to succeed in their jobs is determined by many factors (Howell & Dipboye, 1986; Muchinsky, 1997; Mullins, 1996). Motivation to work well is usually related to job satisfaction, however the direction of this relationship is not clear. Job satisfaction is an attitude, an internal state that could be associated with a personal sense of achievement, either quantitative or qualitative (Mullins, 1996). The level of job satisfaction is affected by a wide range of variables relating to individual, social, cultural, organisational, and environmental factors. Stress may occur as a result of dissatisfaction involving one or more of the variables mentioned. Stress at work has been found to have a major influence in absenteeism and turnover. In this study, job satisfaction is used in the broadest sense, as the overall subjective feeling of satisfaction participants experience in the workplace.

Job Performance

The relationship between job satisfaction and job performance is an issue of continuing debate. It may seem reasonable to assume that satisfaction leads to performance, however, research evidence has predominantly indicated that there is no strong linkage between satisfaction and productivity (Mullins, 1996). Job performance is of interest in this study because of its possible relationship with long-term employment. Whilst job satisfaction may be of paramount importance to the worker, employers generally value workers who perform well. Consistently poor performance is unlikely to result in long-term employment within one organisation.

For individuals with TBI, levels of job satisfaction and job performance may be influenced by pre-injury employment history and acceptance of post-injury limitations. Therefore, an individual may not be satisfied with his or her lower level job post-injury, but is able to perform well because he or she accepts that it is not possible to return to pre-injury levels of functioning.

Social Support

Most people have an intuitive sense of the meaning of social support, however, it is still an elusive concept to define. One way in which this can be done is by capturing the essential aspects of this construct by integrating common elements

across definitions. Some researchers equate social support with 'resources' provided by others such as information, advice, and instrumental assistance. Others emphasize a sense of belonging within a group or a connection with others, while the component of validation or affirmation is considered by others. Therefore, social support seems to involve three different aspects; connection, resources, and validation (Bates & Toro, 1999). In this study social support includes actual support received and the range of support TBI individuals perceived would help them with a return to work. Thus, social support could include the need to be accepted, to be treated as a worthwhile contributor in a group, as well as the more obvious need for practical help.

Spillover

The diversification of the workplace which is increasingly populated with women, single parents, and dual-career couples, has increased the potential for conflict and stress as many workers struggle with the demands of paid employment and home responsibilities. Over the past 15 years research findings have begun to identify legitimate connections between the two spheres of work and family. One proposed model representing a perspective on how people fill both work and family roles is the '*spillover*' model. In general, spillover is a notion of positive relationships between work and family variables, for example a good family environment would enhance an individual's satisfaction with work (Muchinsky, 1997). Applied to individuals with TBI, it can be argued that easing their workload at home, by providing assistance with chores could enhance their work experience.

Aims and Objectives of The Present Study

This research is exploratory in design. Its objective is to study relationships among various premorbid factors, functional social support, post injury employment, and job satisfaction, performance, and importance, in order to highlight appropriate areas for possible further investigation in the future.

The present study reports on the examination of pre-accident, accident, and post-accident factors, which may influence return to work in a New Zealand sample. The pre-accident factors include demographic features such as patient's age, sex, whether

working full-or part-time, as well as the extent of job satisfaction, job performance, the importance of being employed, and amount of social support received for domestic chores. The one accident-related factor examined was the Glasgow Coma Scale at acute admission.

Post-injury factors include the types of rehabilitation received, whether working part- or full-time, time to first job, job satisfaction, job performance, the importance of being employed, difficulties directly related to return to work, and amount of functional social support received, as well as reports of the actions and attitudes of others that TBI individuals perceived to be helpful in promoting return to work.

CHAPTER THREE

Research Design and Methodology

Source of Study Population

Participants for the current study were mainly recruited from three Auckland organisations offering services for people with TBI. Initial contact was made with the Managers and Rehabilitation Coordinators of each centre in order to discuss the requirements of the study, and to seek an agreement to participate in the research. A number of participants were also recruited by word of mouth. Notices outlining the research were also distributed at Massey University Campus, Albany.

The Sample

The invitation to participate was extended to all individuals who had sustained a brain injury. Volunteers who had sustained a TBI were included in the study if they fulfilled one of the following criteria:

- 1). Currently employed.
- 2). Not currently working, but had worked at some stage after their injuries.
- 3). Not currently working, but had worked before their injuries or were studying and considering future employment.

A total of 40 TBI patients returned completed questionnaires. This was considerably less than planned and was due, in part, to the fact the largest organisation approached did not refer any clients.

Survey Procedures

Prior to distributing the questionnaire it was necessary to obtain ethical approval from both the North Health Human Ethics Committee, Auckland, and the Human Ethics Committee of Massey University. Approval for the study to proceed was granted by both committees.

Prospective participants attending the centres were generally seen by one or more therapists either individually or in groups. Clients were informed of the study and an

invitation to participate was extended verbally or by distribution of invitation sheets by the therapists. The survey method chosen did not necessitate the researcher to be in direct contact with any of the participants. However, it was made clear that the researcher would be available to provide further explanation of the procedure and purpose of the study, to individuals or groups of individuals, upon request. Therefore, a contact telephone number was also provided with the invitation.

Questionnaire Distributions

Collection of data was by means of self-administering questionnaires, one to be completed by the individual with TBI, and another to be completed by their employer if applicable.

The questionnaires were organised into “packs” in order to facilitate distribution. Each questionnaire pack contained:

- An information sheet.
- A consent form
- Three colour coded questionnaires for the participants. A green questionnaire for individuals who had not returned to work post injury, a blue questionnaire for those who had returned to work, but who were not employed at the time they completed the questionnaire, and a yellow questionnaire for those who were currently employed.
- A separate information sheet and questionnaire to be forwarded to employers.
- Prepaid envelopes for the return of the completed questionnaires.

In order to facilitate distribution, a number of questionnaire packs were left with a key contact staff member at each organization. Participants were able to take the questionnaire home to complete and return in their own time. The total number of questionnaire packs distributed was 150.

Questionnaire Development

Construction of the questionnaire was based on the need to obtain information other than neuropsychological data. The limitation of neuropsychological tests as a tool to predict functional abilities was discussed in the previous chapter. The focus of

the current study is not on whether a person has reached sufficient physical recovery to enable a return to some form of employment. Rather, it is concerned with the exploration of psychosocial and attitudinal variables related to work.

A suitable questionnaire specifically addressing the influence of these variables on return to work was not available. Therefore, the questionnaire used here was specifically constructed to meet the aims and objectives of the study. The study called for volunteers who were at the post-acute stage of their injuries, and for whom the focus of rehabilitation had moved beyond the immediate requirements arising from medical problems, for instance regaining and managing physical functions such as mobility and daily self care.

As mentioned by Smith (1992), subjective experiences influence the level of stress felt by individuals. Stress, in turn, can influence performance. It can be argued that having to perform household duties without assistance could result in fatigue and increase stress levels for people with TBI. Therefore, questions were included to establish the amount of housework individuals were responsible for before and after their accident. The questionnaire also included open ended questions regarding the actions and attitudes of others that participants would find helpful for a return to work. Premorbid factors included variables such as pre-injury job satisfaction, job performance, and the importance of being employed, length of tenure, and employment status (full- or part-time work).

A 46-item questionnaire was constructed, and was separated into two sections. The first section included demographic information and pre-accident details. The second section gathered post-accident information. Both sections contained questions regarding the participants' employment status if relevant (i.e. length of tenure, hours worked, title/job description), job satisfaction, job performance, and the importance of being employed.

A questionnaire was also constructed for completion by the employers of the participants. This questionnaire consisted of 12 items and requested information on their needs as employers of people with TBI. The questionnaire was kept brief to increase the likelihood that busy employers would take the time to complete it. The first three items in the employers questionnaire echoed questions asked in the TBI

questionnaire. These questions were concerned with length of tenure, employment title, and hours worked.

Piloting of Questionnaire

The original questionnaire, consisting of 46 items was piloted by five TBI volunteers from two of the participating rehabilitation centres. One person had never worked since the accident, three returned to work post injury, and one was employed part-time. The volunteers completed the questionnaire in the presence of a staff member or the researcher. The process of piloting highlighted a number of areas in which revision of items and restructuring were required.

The volunteers found that the questionnaire was:

1. Too long.
2. The layout was confusing with respect to groups of items that did not apply to some participants, because of different current employment statuses.
3. Too many “go to” statements.
4. Too complicated in some of its wording.

Based on the comments of those who volunteered to pilot the questionnaires, and the observations of the researcher, changes were made to the questionnaire for the study itself.

The Revised Questionnaire

The revised questionnaire was organised into two major sections. The first gathered information pertaining only to pre-accident details, and the second for post-accident information. In the first section participants were required to provide demographic information such as: Age, marital status, ethnicity, and date of accident. The items in section one attempted to obtain information regarding pre-injury employment such as: Job type and status (whether full or part-time), length of tenure, level of perceived job satisfaction and performance, and the importance of being employed.

The second part of the questionnaire mirrored a number of the questions asked in part one. This section attempted to establish how soon individuals return to work

post-injury, as well as their level of satisfaction, perceived performance, and how important being employed was to them personally. Post-injury employment status will tend to differ from person to person, in that some people are likely to return part-time instead of full-time, and some will not have returned to work at all, thus different questions are applicable to different groups. Furthermore, a number of participants who initially did return to work did not manage to sustain employment. As a result of the comments of those who piloted the questionnaire, the second section was separated into three categories, each printed on a different coloured paper for ease of identification of each category. Each respondent completed the questions in only one category. The options were:

- 1). Yellow Questionnaire; for those who were currently working.
- 2). Blue Questionnaire; for those who returned to work at some stage after their injury, but who were currently unemployed.
- 3). Green Questionnaire; for those who had not returned to work at all.

No changes were made to the original employers questionnaire, which was not piloted.

Follow-up

Private addresses for participants were not available, therefore it was not possible to send reminder letters. Instead, staff members at each participating rehabilitation centre were encouraged to remind prospective participants to return the questionnaires if it was their intention to take part in the study. After the initial distribution questionnaire packs continued to be available for any new clients at the rehabilitation centres.

Each of the participating rehabilitation centres was assured that a summary of the findings would be sent to them at the completion of the research.

CHAPTER FOUR

Results

In this chapter demographic information is reported first, followed by formal comparisons between various employment groups. Finally responses to the open ended questions are reported. These pertain to the actions and attitudes of others, that participants considered would be helpful with respect to returning to work.

A total of 150 TBI questionnaire packs were distributed and 40 (26.67%) completed questionnaires were returned. No questionnaires were returned from the largest of the three organisations that originally agreed to participate. One third of the potential pool of employer questionnaires (9/27) were returned.

Demographic Information

The SPSS Frequencies procedure was used to determine the frequencies and percentages of the demographic variables.

There were almost twice the number of male respondents compared to female respondents. The age of the respondents ranged from 18 to 59 years of age ($M = 36.8$, $SD = 9.10$). At the time the questionnaire was completed, six participants were divorced, 23 were single/never married, and 11 were married or in de facto relationships. Time from the accident to the completion of the questionnaire ranged from one year to 29 years and 3 months ($M = 8.4$, $SD = 7.62$). Table 3 provides a summary of the respondents' general demographic information

Table 3
Demographic Statistics

<i>N</i> = 40	Frequency	%
Gender		
Male	26	65.0
Female	14	35.0
Ethnicity		
European	36	90.0
Maori	3	7.5
Other	1	2.5
Marital Status		
Married/De Facto	11	27.5
Divorced/Single	29	72.5

All 40 participants were employed in some capacity prior to their injuries. Three had been full-time students with part-time jobs. Of the 40 participants, 13 (32.5%) did not return to any form of employment post-injury. A further 12 (30%) individuals did return either part or full time, but at the time of completion of the questionnaire they were no longer employed. Thus the participants fell into three distinct groups in terms of post-injury employment status. Mean time in pre-injury employment was three years and eight months, with a range of two weeks to 20 years.

Of the 27 participants who returned to work post-injury, 17 worked for the same employer as they did pre-injury, ten worked over 35 hours per week, a further ten worked between 20 and 34 hours per week, and seven individuals worked under 20 hours per week. Eleven out of the 27 individuals returned to work for companies employing more than 30 people, 14 were worked for companies with less than 20 staff, and two were employed by companies with staff numbering between 20 to 30. Table 4 shows the numbers of participants in full-time and part-time work before and after sustaining a TBI.

Table 4
Pre- and Post-injury Employment Status

	Unemployed	Part-time	Full-time
Pre-accident employment status	0	7	33
Post-accident employment status			
Not-employed	13		
Unsuccessful-return-to-work		6	6
Currently-employed		12	3

Seven out of the 12 unsuccessful-return-to-work individuals worked over 35 hours per week post-injury. By contrast, only three of the currently-employed individuals worked over 35 hours per week post-injury.

All 40 participants reported receiving one or more of the following rehabilitation programmes post -injury: Counselling, Speech/Language Therapy, Physiotherapy, Occupational Therapy. Six people could not recall how soon following their injuries they began rehabilitation programmes. Otherwise the time from accident to rehabilitation ranged from one week to 11 years. Only 11 participants reported that they received professional assistance or advice specifically to help them return to work. Table 5 gives a summary of the numbers receiving each type of rehabilitation programmes.

Table 5
Rehabilitation Programmes (N = 40)

Programme	Frequency	%
Counselling	25	62.5
Speech/Language Therapy	25	62.5
Physiotherapy	29	72.5
Occupational Therapy	31	77.5
Vocational Counselling	11	27.5

The questionnaire asked participants to indicate their involvement in six different types of household duties. They were: Cooking, cleaning, shopping, gardening, childcare, and house maintenance. Table 6 shows the number people indicating involvement in each of those categories pre-injury, and the number of participants who indicated they required help with those same tasks post-injury.

Table 6
Involvement and Assistance with Household Duties

Activity	Pre-injury involvement	Post-injury help
Cooking	32	21
Cleaning	31	27
Shopping	32	23
Gardening	26	14
Childcare	12	6
House maintenance	23	23

Most participants reported receiving some form of help with household duties post injury. Whereas 32 people performed the task of cooking pre-injury, post-injury 21 of them received help with that particular task. Twenty-eight out of 40 reported receiving help from either their partner/spouse and/or other family members, 15 out of 40 received paid help.

Only twenty-one participants gave consent for their hospital medical records, including Glasgow Coma Scale scores, to be accessed. Only eight GCS scores were available. In addition, three of the participants were described in their medical records as having sustained 'severe head-injuries', however no Glasgow Coma Scale was recorded for these. One other person was recorded as having 'mild head-injury'. A further five participants did not have any form of written record of their TBI. One possible reason for this is that those individuals may not have experienced a period of unconsciousness, and were initially admitted for other, more obvious injuries. Hospital records were not available for the remaining four participants. Thus the severity category of participants for whom Glasgow Coma Scale scores or

descriptions were available for were as follows: Severe (GCS < 8) = 6, moderate (GCS 9-12) = 1, mild (GCS >12) = 5.

Pre- and Post-injury Variables

A number of factors that were thought to impact on successful return to work were measured using continuous analogue, rather than Likert scales. These included pre- and post- injury amount of household help received, job satisfaction, perceived job performance, the importance of being employed, and the perceived match between job and ability. The analogue scales were chosen to facilitate parametric analyses. It had been intended to employ a logistic regression analysis, using employment status as the dependent variable, as well as analyses of variance, and t-tests. However logistic regression was not considered viable given the small sample size. Prior to analysis the independent variables were examined to determine their suitability for parametric tests. In particular the distributions of scores on the analogue scales (cm from the left-hand side of the 10cm scale) were examined to ascertain whether they were approximately normal. For this purpose the Wilk-Shapiro, statistic, W, was used, with a criterion probability of $p > 0.05$. When the data were broken down into groups based on employment status, approximately 50% of the distributions of scores proved to be non-normal.

Although many parametric tests are fairly robust with respect to violations of the usual assumptions of normality and homogeneity of variance, given the much smaller than planned overall sample size ($n = 40$), and even smaller individual group sizes, no attempts were made to transform the data to normality, and non-parametric analyses were chosen for all comparisons. The Kruskal-Wallis test was used for comparisons involving three independent groups, and the Wilcoxon Rank Sums 2-sample test with continuity correction of .5 equivalent to Mann-Whitney U-test, was used for comparisons involving two independent groups. Pre- and post-accident comparisons from the same participants were performed using the Wilcoxon Signed Ranks test. It was decided that, if individual nonparametric comparisons came close to reaching significance, the specific data set involved would be re-examined, and submitted to a more powerful parametric analysis, providing the underlying assumptions could be

met. Using these criteria, only one of the analyses reported below was repeated using a parametric test. An alpha level of $p < .05$ was adopted for all comparisons.

Post-hoc power estimates, using Cohen's (1988) conventions, were conducted using G-Power software (Buchner, Erdfelder, & Faul, 1997).

To simplify the reporting of the results, details are provided in the text only where significant results were obtained. Full details of all comparisons can be obtained from Appendix 1.

Household Help

A Kruskal-Wallis test, with correction for tied ranks, was conducted using SAS (Statistical Analysis System) software to evaluate differences among the three employment groups (not-employed, unsuccessful-return-to-work, and currently-employed) with respect to the amount of household help received pre-injury. As expected, the three groups did not differ in the amount of household help received pre-injury. A similar analysis was conducted to evaluate differences with respect to the amount of help received post-injury. There was significant difference between the groups post-injury, $\chi^2(2, N = 40) = 9.54, p = .008$. The medians for the three groups were as follows: Currently-employed 3.2, unsuccessful-return 3.9, and not-employed 9.2. It appears that that individuals who successfully returned to work post-injury received less help with duties than either those who did not return to work, or who made an unsuccessful attempt to return to work.

All three groups responded to a question regarding the importance, for a return to work, of receiving help post-injury. A Kruskal-Wallis test confirmed a significant difference between the groups, $\chi^2(2, N = 40) = 6.12, p = .047$. The currently employed group rated post-injury household help less important, (Mdn = 3.9), than the unsuccessful-return, (Mdn = 8.2), or the not-employed group (Mdn = 9.2).

Follow-up tests were conducted to evaluate pairwise differences among the three employment groups, controlling for Type I error across tests using the Holm's sequential Bonferonni approach. Each pairwise comparison was tested at the .017 level. With respect to the amount of post-injury help received, the unsuccessful-return group did not differ significantly from either the not-employed group or the currently-

employed group. However, the not-employed group differed significantly from the currently-employed group, $z = -2.49$, $p = .001$. The result of the follow-up tests for the importance of post-injury help, indicated one of the three pairwise differences was significant: the difference between the not-employed group and the currently-employed group, $z = -3.12$, $p = .011$

The Wilcoxon Signed Ranks test was conducted to test whether overall (irrespective of employment status) more household help was received after than before accident. The difference was significant, $p = .004$. The median score for amount of help received pre-injury was 3.37, and post-injury was 5.27.

Job Satisfaction, Job Performance, and Job Importance

The questionnaire provided participants with an analogue scale with which they could respond to questions regarding pre-injury, and where appropriate, post-injury, levels of: 1. Job satisfaction, 2. Job performance, and 3. The importance of having a job. Analyses were conducted to evaluate differences between the employment groups with respect to these variables.

Pre-injury

Kruskal-Wallis tests were conducted in order to evaluate whether the three groups were equivalent, post-injury, in their ratings of job satisfaction, job performance, and the importance of being employed. The tests confirmed that the groups did not differ with respect to pre-injury attitudes to work.

Separate Kruskal-Wallis tests were conducted to evaluate whether single or partnered participants differed in terms of their ratings on pre-injury job satisfaction, job performance, and the importance of being employed. No significant differences between the groups was found.

Post-Injury

Separate Mann-Whitney U tests comparing post-injury job satisfaction and post-injury job performance between the currently-employed, and the unsuccessful-return groups did not reveal any significant differences. However, the three employment

groups differed post-injury in their assessment of the importance of being employed, $\chi^2(2, N = 40) = 9.92, p = .007$. The currently-employed group rated being employed of greater importance than either the unsuccessful-return, and the not-employed group. The medians for the three groups were 9.5, 7.85, and 7.7 respectively.

A comparison between the currently-employed and the unsuccessful-return groups with respect to their ratings of the match between their jobs and their abilities produced a marginal result, $\chi^2(1, N = 27) = 3.81, p = .05$. The distributions of the relevant scores were checked and, as they were normal, the more powerful independent groups t-test was applied, giving $t(25) = 2.09, p = .047$. The means were: For the unsuccessful-return group 5.7; and for the currently-employed group 3.6.

Separate Mann-Whitney U tests were conducted to evaluate differences between single and partnered participants in terms of their ratings of post-injury job satisfaction, job performance, and the importance of being employed. No significant outcomes were obtained with respect to job satisfaction and the importance of being employed. However, the groups did differ with respect to post-injury job performance, $\chi^2(1, N = 27) = 4.14, p = .04$. It appears that the single group rated their job performance more highly (Mdn = 7.9) than the partnered group (Mdn = 5.7).

Pre- to Post-Injury Comparisons

Separate Wilcoxon Signed Ranks tests were conducted to evaluate the overall difference between pre- and post-injury job satisfaction, job performance, and job importance, for the currently-employed, and the unsuccessful-return-to-work group. There was a significant difference between pre- and post-injury job satisfaction, $p = .046$. Job satisfaction was significantly different lower after the accident, (Mdn = 7.5, compared to before accident (Mdn = 8.9).

There was also a significant difference in self assessment of pre- and post-injury job performance, $p < .001$. The median rating of performance was higher pre-accident (Mdn = 8.4) than post-accident (Mdn = 6.9).

Pre- and post-injury ratings of the importance of being employed were significantly different, $p = .005$. The median for the importance of being employed was higher pre- injury (Mdn = 9.4) than post-injury (Mdn = 8.9).

Correlational Analyses

Spearman's correlation coefficients were computed among all 10 variables measured on analogue scales. They were: Pre-and post-injury job satisfaction, job performance, the importance of being employed, and help with household duties, plus two additional post-injury factors, the importance of help, and the match between job and ability.

The results of the correlational analyses are shown in Table 7, ten out of the 45 correlations were statistically significant. These correlations ranged from $\rho = .32$ to $\rho = .56$.

Table 7
Correlation Matrix for Items Scored on Analogue Scale

		PreSat	PrePerf	PreImp	PreHlp	PostImp	PostHelp	ImpHlp	PostSat	PostPerf
PrePerf	Corr.	.292								
	N	40								
PreImp	Corr.	.212	.519**							
	N	40	40							
PreHlp	Corr.	.009	.057	-.041						
	N	40	40	40						
PostImp	Corr.	.216	.233	.329*	-.426**					
	N	40	40	40	40					
PostHlp	Corr.	.042	-.009	.216	.270	-.271				
	N	40	40	40	40	40				
ImpHlp	Corr.	.125	.299	.227	.063	-.025	.561**			
	N	40	40	40	40	40	40			
PostSat	Corr.	-.158	.007	.049	-.394*	.450*	.127	.262		
	N	27	27	27	27	27	27	27		
PostPerf	Corr.	-.241	.235	-.128	-.268	.144	-.317*	-.038	.408*	
	N	27	27	27	27	27	27	27	27	
PostAble	Corr.	-.034	-.206	.074	-.060	-.010	.313	.414*	.034	-.429*
	N	27	27	27	27	27	27	27	27	27

*.p<0.05 (2-tailed)

** .p<0.01.(2-tailed).

Actions and Attitudes of Others That Could Facilitate Employment

Participants responded to four questions regarding the actions and attitudes of friends and family, other employees, and employers, and the advice they would like to offer to other people with TBI with regards to return to work. The responses to each question were examined so as to identify common themes. Two post-graduate students (the author plus one other) then separately assigned participants' comments to themes identified under pre-agreed headings. Interrater reliabilities were calculated for the assignment of comments to categories.

Actions and Attitudes of Families

Participants were asked to respond to the following question: *What do you consider the most helpful actions or attitudes your family can have to make a return to work as easy as possible?*

Responses were categorised under four themes: Functional support, Emotional Support, Advice, and Education of others.

In this study functional support refers to practical help that is tangible, and emotional support refers to social support that is intangible (e.g. sympathy and friendship). Advice was included as a category to accommodate responses referring to the need, felt by some participants, to be guided more specifically by those close to them in managing their brain injury.

Some participants also indicated that they felt it very important for people close to them to obtain information and be educated about traumatic brain injury and its consequences. Thus, the category Education was included.

Cohen's kappa (k) measuring interjudge agreement for the categories mentioned above was .92. The number of responses for each of the categories is shown in table 8.

Table 8

Actions and Attitudes of Families ($N = 40$)

Category	n	%
Functional support	19	47.5
Emotional support	27	67.5
Advice	2	5.0
Education	6	15.0

Many participants expressed a need for more than one of the helpful actions listed. Out of all 40 participants, 67.5% indicated that they find emotional support to be helpful. Some of those same individuals also expressed the need for functional support, advice, and education of their families.

Actions and Attitudes of Other Employees

Responses to the question *What do you consider the most helpful actions or attitudes other employees could have in order to make a return to work as easy as possible?* were categorised under the three headings of Functional support, Emotional support, and Education. The kappa score for this question was $k = 0.87$. The number of responses that fell under the three theme headings are given in Table 9.

Table 9

Actions and Attitudes of Other Employees ($N = 40$)

Category	<i>n</i>	%
Functional support	14	35.0
Emotional support	23	57.5
Education	12	30.0

Actions and Attitudes of Employers

Participants were also asked to respond to the following question: *What advice can you offer to help employers of people in your position to understand and meet the needs of head injured employees?* The main themes from the responses were categorised under the headings: Flexible hours, Education, Communication, Emotional support, Workplace adjustment, and Workload adjustment. The interrater reliability for this question was $k = 0.76$.

Table 10 provides the number of responses that fell into each category.

Table 10
Advice to Employers (N = 40)

Category	<i>n</i>	%
Flexi. Hours	11	27.5
Education	20	50.0
Communication	6	15.0
Emotional support	9	22.5
Workplace adjustment	5	12.5
Workload adjustment	11	27.5

Advice to Others with TBI

The final open-ended question was: *What would you like to say to other accident victims that would help prepare them for the experience of returning to work?* The categories for this question are: Return part-time, Use memory aids, Have regular breaks, Consider a job/career change, and Obtain vocational counselling. The kappa score for this question was $k = 0.96$.

Participants' responses that fell into each category are shown in table 11.

Table 11
Advice to others with TBI (N = 40)

Category	<i>n</i>	%
Part-time	9	22.5
Memory aids	2	5.0
Regular breaks	2	5.0
Job/career change	12	30.0
Vocational counselling	6	15.0

Changes to Work Situation

Only eight participants responded to the question "List any aspects of your current working situation you would change if you could".

Four people would like more varied, challenging jobs or longer hours, their responses are as follows:

"More brain work needed".

"Need a more stimulating job than this".

“Would love to work more hours”.

“Would like to spend less time on writing, reading and analyses”.

Changes to the actual workplace or work station was mentioned by a further two:

“A computer would assist with concentration, demanding less mental effort than trying to write and rewrite. A quiet office as noise and light are a problem”.

“Have to negotiate one set of stairs, could do with ramps”.

One participant indicated that a change of personal outlook, rather than the actual work situation would be more positive. The comment was:

“Forgive people around you for not understanding”.

One other participant also indicated a desire for change in attitude, commenting:

“I would like my immediate boss to have more trust and faith in me. [To] forget my mistakes”.

Employers Questionnaire

Nine out of a possible 27 employers completed the employer questionnaire. Seven employers had the individuals working for them before their injuries, and two were new employers.

Four employers stated that they would have appreciated more advice, or assistance in integrating, or reintegrating the employee into the workplace. The types of information included:

“Weekly assistance/visitation by caseworker, and help in understanding effects of head injury”.

“General advice on the after effects of head injury”.

“I was not conversant with the detailed medical situation. Some literature would have helped”.

“Any information, written or verbal, would have helped”.

Of the five employers who indicated that they did not require more advice or assistance, only one gave a reason, commenting that:

“Already knew of implications/effects of head injury with my son”.

Employers were asked the question - *What extra help or advice would you like to see made available to post-injury employees with respect to their performance in the workplace?*

Two employers would like contact or workplace visitation from the professionals dealing with the employee, for example an Accident Compensation case manager, or a

rehabilitation programme manager. One employer indicated that financial assistance, such as an income subsidy, would be beneficial. A further three employers suggested in-house training, and provision of literature on TBI for employers to enable them to provide the employees with appropriate help.

CHAPTER FIVE

Discussion

This study set out to explore factors that were either in actual fact, or in the perception of brain injured persons themselves, related to successful return to work. Return to work in this context should be interpreted broadly, so as to include both full-time and part-time paid employment or even, in some cases, a return to a purposeful occupation of time. The data highlight the poor rate of long-term job retention following TBI, and the need for a holistic multidisciplinary approach to vocational rehabilitation for this growing population. Although over half of the total sample in this study returned to work post-injury, at the time of completing the questionnaire many of these were no longer employed. Very few had received any formal help specifically addressing a return to work. The few who were still employed were working part-time, and at reduced levels of employment. The high unemployment rates among TBI individuals suggest that traditional approaches to physical and vocational rehabilitation have been inadequate (Kreutzer et al., 1988).

The discussion will address several broad areas of concern, each encompassing a factor or factors that are important for a return to work following TBI. These areas include the need for vocational rehabilitation specific for people with TBI, the influence of situational and attitudinal factors on return to work, and the needs of employers of people with TBI.

Demographic Variables and Vocational Rehabilitation for TBI

The present study received responses from almost twice the number of males than females. This is consistent with the findings of previous studies on TBI where men tend to outnumber women in a ratio of two or three to one. With respect to age, previous studies report that TBI tends to affect the primary working population aged between 15 to 64. The age of the respondents for this study ranged from 18 to 59 which also appears to be consistent with the findings of previous studies (Abrams et al., 1993; Englander et al., 1992; Roessler, et al.,1992). Because many individuals with TBI can be expected to have a normal life span, concerted efforts in assisting them to return to a state of productive living will ultimately reduce the financial cost on society as a whole.

The sample consisted of 90% European and/or Pakeha New Zealanders and only 7.5% Maori, with 2.5% made up other ethnic groups. According to a survey conducted by the Auckland City Council (1996), the population of greater Auckland was 1.068 million. Within the city boundary the population was 346,000, of these 74% were European, 11% Maori, 8% Pacific Islands people, and 7% other ethnic groups. The New Zealand Accident Rehabilitation and Compensation Insurance Corporation report (1998) on Traumatic brain injury among adults living in the Manukau city areas did not find a marked difference in prevalence or cause of TBI across different ethnic groups. The report acknowledged that there exists a perception that the incidence of TBI is higher amongst non-Europeans. However, to date there are no data available to challenge this perception.

In the main, this study drew its sample from organisations currently offering services to people with TBI in the Auckland area. It is possible that the fairly low representation of non-European participants may be an indication that the services provided are not reaching other ethnic groups. TBI individuals of ethnic minority groups may not be receiving post-injury rehabilitation either because of a lack of awareness of the services available, or a lack of information on how to access those services. It is important that all necessary interventions are put into action as early as possible, because research has established that most of the recovery tends to occur in the first year, and too large a gap between injury and rehabilitation is likely to reduce the success of programmes (Ninomiya et al., 1995).

Although all 40 respondents were employed or studying full time before their injuries, less than half of the total participants were employed at the time of completing the questionnaire. Previous studies generally reported similarly poor rates of return to work. Studies reporting post-injury employment rates higher than 50% often did not include participants in the severely injured category. In addition, individuals who returned to work reportedly experienced injury-related problems that interfered with performance in the workplace.

Return to work for individuals with TBI is seldom smooth. Many TBI sufferers struggle with injury-related problems long after their injuries. This means that for some, returning to pre-injury levels of employment, and indeed full-time employment post-injury is not possible. Of the 15 participants who were employed at the time of completing the questionnaire, only three had returned full time and to the same level of employment as they held prior to their accidents. The remaining 12 were working

part-time at a reduced level of employment. Nine out of the 15 reported having problems with fatigue, 13 had problems with memory and concentration, and five reported that they had physical limitations that made it difficult to perform at work. Part of preparing individuals for a return to work may need to include raising their awareness of change in abilities post-injury, and their possible impact on their choice of careers. Where possible, setting up work assessments in real work setting may help some individuals to develop realistic occupational goals.

For the twelve individuals who made an unsuccessful attempt to return to work, it would appear that difficulties arising from their brain injury resulted in a number of negative effects on work life. Among the reasons reported by participants for leaving a job included, getting fired, and problems with fatigue and concentration. It is also interesting that a greater number of individuals in the unsuccessful-return group had been working over 35 hours per week post-injury, compared with the currently-employed group. Returning to full-time work before adequate levels of physical, emotional, and neuropsychological recovery have been achieved, may be an influencing factor in failure to sustain employment.

It is clear that many individuals with TBI are not able to return to pre-injury levels of employment. However, effective vocational rehabilitation may reduce the likelihood of returning to work too early, poor match between job and ability, and having employers who are unaware of the outcomes and limitations of a brain injury.

Most of the participants reported undergoing combinations of physiotherapy, speech language therapy, occupational therapy, and psychological counselling post-injury. In a number of cases intervention did not begin until several years post injury, the longest gap being eleven years. One reason for this is that rehabilitation specific to brain injury is relatively new in New Zealand, and it was not available at the time when some individuals first sustained their injuries. In a review of employment after severe brain injury and its relationship to the utilization of Manpower Services Commission programmes, Johnson (1989, cited in Ninomiya et al., 1995) reported that return to work programmes failed because they were too short or use was made of them at too long an interval post injury.

Vocational rehabilitation for people with TBI should not be viewed as separate from other rehabilitative treatment that individuals may have to undergo. The success of vocational rehabilitation could depend on the relative success of other rehabilitative interventions, the time post-injury individuals begin the programmes, and the extent to

which individuals acknowledge and accept any limitations resulting from their injuries. Because TBI sometimes result in outcomes that make paid employment an unrealistic goal, vocational rehabilitation may need to be broadened to encompass counselling and realistic advice on other productive use of time.

Only eleven out of all 40 participants reported receiving counselling specific to a return to work. Because of the multi-faceted nature of TBI, vocational rehabilitation for TBI individuals is a complex process. A positive outcome is dependent upon the experience and nature of personnel involved in assisting their progress (Ninomiya et al., 1995). The apparent difficulties involved in maintaining employment following TBI highlight the importance of having vocational rehabilitation professionals who have a comprehensive knowledge of the effects of brain-injury, and how certain outcomes are likely to impact with employment.

Situational Factors and Return to Work

Most people have to perform a number of necessary tasks out of the workplace. One of these is the daily responsibility of home management. Whilst juggling work and home keeping may not pose a problem for people without a brain injury, difficulties associated with TBI such as fatigue, and lack of organisational skills could result in a negative relationship between housework and return to work for TBI victims. It can be argued, therefore, that individuals with TBI may be better able to cope with employment if the amount of out-of-work duties they have to carry out is reduced, or even eliminated, in the early days of return to work. Thus, receiving assistance with household duties may have a mediating effect on long-term employment by reducing fatigue and stress. Perhaps because a return to work is often taken as an indicator of recovery, home assistance is sometimes significantly reduced or even withdrawn once an individual has returned to work. However, continuing assistance, especially in the early stages of returning to work, may increase the chances of success, and prove to be economical in the long term.

Unsurprisingly, the three employment groups differed significantly on the amount of help received post-accident but not pre-injury. Somewhat surprising was the finding that the currently-employed group received less help than either the unsuccessful-return group, and the not-employed group. This seemed contrary to the expectation that working individuals would require and receive more help. A possible explanation may lie in the severity of injury, in that the working group may have been

less severely injured and consequently be more functionally independent than the two not working groups.

Unfortunately, GCS scores were not obtainable for all of the participation of this study. Thus it was not possible to perform statistical analyses on the possible influence of injury severity on post-injury employment status. However, support for a negative relationship between injury severity and return to work was found from the few GCS scores obtained. Among those whose GCS scores were available, only one out of the six individuals categorised as severely injured (GCS < 8) had returned to work post-injury. All five mildly injured individuals (GCS >12) returned to work post-injury, and only one was no longer employed at the time of the completion of the questionnaire. The one moderately injured person was currently-employed.

The currently-employed group also rated receiving household help post-injury less important than the not employed groups. This may also be related to the level of functional independence of the groups. Twelve out of 15 of the currently-employed group were working part-time. It is possible that the combination of less severe injury, higher functional independence, and part-time work, mitigated the importance of receiving help. As can be expected, however, overall more help was received post-injury than pre-injury.

The fact that there was a strong positive correlation between the importance of receiving help post-injury, and the amount of help received post-injury ($\rho = .56$) indicate that, to some extent, those who require extra help are receiving it, and acknowledge the need for it. The study found that the currently-employed group rated the importance of receiving help post-injury lower than either the unsuccessful-return, or the not-employed group, and less help was received by the currently-employed group than the two not employed groups. A moderate negative correlation was obtained between ratings of post-injury help received and post-injury job performance ($\rho = -.32$). This finding may be influenced by the level of individuals' functional ability. Individuals who are more able may be less likely to seek and receive help than less able individuals, at the same time higher levels of functional ability may be related to higher ratings of job performance.

Rating of pre-injury help received was negatively correlated with post-injury job importance ($\rho = -.43$). Low levels of help pre-injury may be an indication of the independent nature of some individuals. It is possible that highly independent people would consider employment to be more important than those with dependent

personalities. Again, to some extent, post-injury outcomes may be influenced by pre-injury variables.

Attitudinal Factors and Return to Work

Many individuals with TBI believe that in time they will be able to return to the same level of functioning as they had pre-injury (Zuger & Boehme, 1993, cited in Ninomiya et al., 1995). Although this does occur in some cases, many people with TBI struggle with various problems long after their injury, making long-term employment a constant challenge. Lack of insight and acceptance of the change in the level of functioning can affect expectation of post-injury employment. Thirty per cent of the total sample made suggestions that other TBI sufferers may need to consider a career change. Generally this recommendation was made by individuals who had attempted and failed to return to pre-injury levels of employment. Some individuals recognised that full-time work may be unrealistic and the advice to return on a part-time basis was made by 22.5% of the total sample. In order to achieve an optimal job match, it is necessary to have employers who are willing to make reasonable accommodation for employees with TBI, such as procedural changes, physical modification of the work station, or the use of assistive technology equipment (Fraser & Baarslag-Benson, 1994).

Four of the currently-employed individuals expressed a desire to attempt more challenging or stimulating roles. An important implication is that vocational success will greatly depend on ongoing professional support. The role of vocational rehabilitation counsellors will not necessarily end with job placement. Monitoring of clients' progress in the workplace is necessary so that individuals can be given a chance to increase their workload and/or responsibility. For this to work well, vocational rehabilitation counsellors and employers would need to have a good working relationship, which requires employers to be well informed about their employees needs. Almost half of the employers who participated in the study indicated that indeed they would have appreciated advice, or assistance in integrating, or reintegrating TBI employees into the workplace.

It is unlikely that individuals would be satisfied with a job if they held a belief that the job is below their level of ability. The success of vocational rehabilitation programme may in part depend on the success counsellors achieve in raising clients' awareness of their deficits. Once individuals have developed a realistic acceptance of

their level of ability, steps can be taken to match the level of ability with a range of appropriate occupations and activities.

Of the 12 individuals who attempted a return to work, but were unemployed at the time of the completion of the questionnaire, two reported that they terminated their employment because the post-injury job was “too boring”, or that they felt they could do something “more challenging”, and four were dismissed as a result of absenteeism. An example of this was given by a participant who wrote: *“I got fired because I didn’t turn up and got into arguments”*. Another participant was fired three times from three different places of employment, stating the following: *“I didn’t like the way they were running things, I also got bored”*. Four participants resigned because they felt they could not cope with the demands of work. One participant wrote: *“I was afraid of making fatal mistakes. This resulted in lack of sleep, no self esteem, and I couldn’t trust myself”*. Relocating was another reason given for leaving work by two of the participants.

The information obtained through comments such as these, could be utilised as guidelines for the development of individualised vocational rehabilitation programmes, specifically in setting up work placement, with a view to long-term employment. In light of the comments obtained, some of the main issues to consider in vocational rehabilitation should include assessments that would provide an indication of the physical, emotional and psychological readiness of an individual to return to work, followed by exploration of appropriate occupations. For individuals who are able to return to pre-injury levels of employment, a staggered approach to return to work may be necessary. In a staggered approach, individuals could return on a part-time basis, with reduced responsibility, and be provided with a workplace mentor or supervisor. As their confidence increases, work hours and responsibility could be increased, and the level of supervision provided reduced accordingly.

Pre-injury assessment of job satisfaction, job performance, and the importance of being employed did not differ between the three post-injury employment groups. Whether or not individuals return to work, and whether or not employment is maintained, may not, therefore, be influenced by the extent to which individuals were satisfied, performed well in their jobs, or considered being employed as important, before their injuries. There is some indication that injury severity was a major influence in post-injury employment grouping, in that only one of individuals categorised as severely injured returned to work post-injury, whereas all of the mildly

injured individuals returned post-injury. It is also possible that factors such as the importance of being employed post-injury and post-injury levels of job satisfaction, could also play a part. For example, individuals who were less satisfied with their post-injury employment may be less likely to maintain long-term employment, and those who did not rate post-injury employment as important were not motivated to return to work. Neither the not-employed group, nor the unsuccessful-return-to-work group, rated being employed as highly as the currently-employed group. This, however, may simply be a rationalisation, in that those who rated employment as less important did so because they were not working, and that the employed group rated employment as more important because they were working. Individuals who felt that being employed was not important post-injury, may be more disinclined to seek employment than those who rated employment as being more important. Similarly, individuals with higher rating of post-injury job satisfaction and the importance of being employed may be more likely to stay in a job than those who rated those items lower.

The importance of being employed was also rated higher pre-injury than post-injury. There are several possible reasons for this. A number of the participants were several years post injury. Long periods of unemployment may increase dependency on others and on state aided benefits, and reduce the motivation to return to work. This could result in those factors becoming a disincentive to return to work, leading to a personal reduction in the importance placed on being employed. Unsuccessful attempts to return to work because of injury-related deficits may also lead some individuals to become disheartened, and in time to justify their unemployment by believing that a return to work is not very important.

The significant correlations reported in Table 5 provide some insights worth considering. It would not be unreasonable to expect that certain pre-injury attitudes and personality traits may be carried over to post-injury situations. In light of this, pre-injury factors need to be given important consideration in the development of vocational programmes. In addition it is important to involve individual clients throughout the process of programme development in order to clarify their expectations and employment goals and to assist them to align their expectations with the reality of their situation as much as possible. A moderate positive correlation between pre-injury and post-injury job importance ($\rho = .33$) suggests some continuity in an individual's pre- and post-injury attitudes to work. Therefore, individuals who

considered having a job was important before their accident would continue to rate employment as being important post-injury. The moderately strong positive correlation between pre-injury job importance and pre-injury job performance ($\rho = .52$) may suggest that the more highly employment is rated, the more likely individuals are to try harder or to be committed to their jobs, to the extent that job performance is enhanced.

Post-injury rating of job satisfaction was moderately correlated with post-injury importance of being employed ($\rho = .45$). It seems reasonable that the more importance individuals placed on being employed, the more likely they were to be satisfied in a job, or vice-versa. Post-injury ratings of job performance were positively correlated with ratings of post-injury job satisfaction ($\rho = .41$) but negatively correlated with post-injury help ($\rho = -.32$). Thus, individuals who are most positive about their post-injury job performance are those who are receiving the least amount of help. They are also the more satisfied with their work. This may imply that job satisfaction is unlikely if individuals are dissatisfied with their job performance. It is possible that those with high ratings of job satisfaction, and job performance, and receiving little help are the least severely injury participants.

Further support for the influence of pre-injury factors on a return to work is found in the negative correlation between pre-injury help received and post-injury job satisfaction ($\rho = -.40$). Post-injury job satisfaction was higher for those who had received the least amount of household help pre-injury. This may indicate that individuals who, pre-injury, were accustomed to managing their lives with a minimum of assistance, gained the greatest satisfaction afforded by a return to work.

Post-injury perceptions of job-ability match were positively correlated with the importance of post-injury help ($\rho = .41$), and negatively correlated with post-injury job performance ($\rho = -.43$). Individuals may have a high assessment of their job-ability match, however, they may have little confidence in actually performing work-related tasks, and acknowledge the importance of receiving help in order to enhance work performance. Prolonged periods of unemployment could result in loss of confidence in ones ability. As previously mentioned, returning too soon could have a negative effect on long-term employment. Part of the role of vocational counsellors would be to ensure, where possible, that clients are eased back into work, whether by returning on a part-time basis or having a reduced level of responsibility.

The two groups that returned to work post-injury differed significantly in terms of their ratings of the match between job and ability. Surprisingly the unsuccessful-return-to-work group rated their job-ability match higher than the currently-employed group. Six out of the 12 unsuccessful-return-to-work participants terminated their employment because they were either 'bored' or dismissed. It is possible that those individuals held jobs that were well within or even below their perceived ability level, but that boredom and unacceptable work behaviour acted as barrier to long-term occupation. The match between job and ability was negatively correlated with post-injury job performance ($\rho = -.43$), suggesting that participants may have little confidence in themselves with regards to work. However, a positive relationship between job-ability match and the importance of receiving help post-injury ($\rho = .42$) may be an indication that individuals recognised the part played by assistance with daily chores in their successful return to work.

Long-term occupational success does not depend only on whether an individual is physically capable of performing the task at hand. Good interpersonal skills and reliability are also important qualities. Unfortunately, for many people with TBI behavioural problems are only too real. An inability to interact appropriately with others can alienate co-workers. A return to work study conducted by Godfrey et al. (1993) involving 66 severe TBI patients in Dunedin, New Zealand, found that patients who failed to return to work were rated by independent judges to be significantly less socially able than patients who returned to work. Crites (1982, cited in Haffey & Lewis, 1989) reported 75% of job losses in the nondisabled population were attributable to poor interpersonal skills, as opposed to poor task performance. There is no evidence that employers would rate their disabled workers' ability to get along with co-workers as less important than in nondisabled employees. Pen and paper assessments intended to predict whether an individual may be ready to return to work, may not be sufficient to ensure success at work. In some cases a job trial with supervision may be necessary in order to assess how an individual copes in a real work setting.

Overall, for the two groups that returned to work post-injury both job satisfaction and job performance estimates were reduced following their accident. Because most of the participants for the present study did not return to the same pre-injury level of employment, and given that many of them probably felt they could 'do better' this finding is not surprising. Memory deficit is a common problem of TBI, thus to some

extent this finding may be confounded by the accuracy of the participants' recollection of their employment history. Furthermore, people with TBI often have unrealistic expectations regarding suitable employment. Often, victims of TBI overestimate their ability and request work which is entirely unsuitable to it (Kreutzer et al. 1988). Previous employers, and other family members may be able to provide valuable information that would enable vocational counsellors to create a realistic picture of clients' past and present abilities, and in this way assist in the process of creating a good match between job and ability for the client.

Social Support and Return to Work

Individuals, at different times, require different types of social support, from different people. There is some evidence that social support influences long-term outcome in a variety of rehabilitation client groups. Kaplan (1988) found a relationship between ongoing family social support, and successful vocational outcomes one year post-injury in a group of individuals with TBI. Another study by Kaplan (1990) found a negative relationship between emotional insecurity and vocational outcome, and a positive relationship between emotional stability and vocational outcome. Individuals that experienced stronger social support showed less emotional distress, and a greater likelihood of positive vocational outcome than those with negative evaluation of available social support. This finding suggests that social support variables have an effect on an individual's total employability.

An obvious source of potential social support is the family. Greenspan et al. (1996) found that participants who were married were more likely to have returned to work one year post-injury than those who were not married. In this study, at the time of the completion of the questionnaire, six of the currently-employed individuals were married, and only three were married in the unsuccessful-return category. None were married in the not-employed group. Social support resources for individuals with TBI are often greatly diminished because of injury-related problems, such as aggression, and a general lack of social awareness. A study of recovery from diffuse traumatic brain injury in Johannesburg, by Brown and Nell (1992) suggests that family relationships are the area of life-functioning most disrupted by TBI. Unfortunately, they also found that not one of the participants had received supportive psychotherapy or family counselling. Commencing rehabilitation programmes at an early stage, and ensuring that families are included in the programme, may ultimately prevent the

breakdown of relationships, thus ensuring continued social support for the individual with TBI.

In response to the questions regarding helpful actions and attitudes of others, 67.5% of the total 40 participants reported that emotional support from family was important, whereas 57.5% reported receiving the same type of support from other employees was important. With regards to helpful actions or attitudes of other employees, only 15% stated education of others as being important in a family context. By contrast 30% of the total participants reported that having colleagues who are educated about the effects of TBI would be helpful, and half of all the participants indicated that education of employers was important for a return to work.

TBI individuals may have different expectations of support from different people around them. Individuals may be inclined to expect family to provide more emotional support, but not to expect the people at work to provide such support to the same extent. It was surprising therefore, that emotional support from other employees was considered to be important by more participants (57%) than functional support (35%). On the other hand functional support from employers was considered to be important by more participants than was emotional support. Employer support may have a great influence in the success of long-term employment outcome since many TBI employees require special accommodation in the workplace in order to perform effectively. Educating employers on TBI and its consequences would enable them to provide employees with appropriate support in the workplace.

Families were not expected to be educated about the effects and outcome of TBI to the same extent as employers and other employees were expected to be educated. Participants indicated that they would like their family members to be loving, encouraging, and to be good listeners, whilst employers were expected to have an understanding of limitations, and to assist in functional ways. Working with people who have a reasonable understanding of TBI could ease the process of a return to work, because understanding could mitigate helping.

Actions and attitudes from employers considered to be helpful included allowing flexible work hours, and adjusting the workload to suit the individual, providing emotional support, ensuring good communication to enable exchange of information regarding progress and performance, and adjusting the work environment. Emotional support from employers could be given in the form of encouragement, and regular positive feedback about performance. In situations where an individual is lacking in

confidence this type of employer support would be beneficial. Long-term employment may be related to employers and other employees' understanding about TBI, and how much support TBI workers perceive they are receiving in the workplace. Whether or not individuals remain employed may also depend on regular work assessments. A number of participants indicated that they would welcome more challenging tasks, or would like to work longer hours. Since boredom resulting from lack of challenge can be a problem, work assessments could be carried out in order to identify improvements in ability. This in turn would enable vocational counsellors and employers to take appropriate actions, such as increasing the employee's responsibility and work hours.

Traditional rehabilitation counselling practice tends to focus more on individuals clients, neglecting the social environment. Inadequate focus on the impact of social support on the long-term vocational outcome of people with TBI may provide a reason for the limited success of traditional programmes in serving those individuals (Kaplan, 1990). Vocational rehabilitation for people with TBI could benefit from research that identifies the specific dimensions of social support required at different stages of recovery. As mentioned previously, family relationships are often affected by behavioural problems following TBI. An important role of vocational counsellors would be to ensure that the avenues to access this important resource remain open for their clients. This means ensuring that appropriate systems are in place to prevent relationship breakdowns. One way that this can be achieved is by providing education and support to clients and their families about the consequences of the injury. The success of vocational rehabilitation efforts greatly depends on the opportunities that are available for individuals with TBI, and this in turn may be influenced by the extent of receptive attitudes that exist in the community.

Limitations of the Present Study

Traumatically brain-injured individuals do not form a homogenous group. The success with which they return to work and maintain employment does not depend only on factors such as injury severity, length of coma, or the outcome of their psychological assessments. Personality traits, pre-injury factors, and the extent to which they accept changes in their functioning capacity could also play a part. Conclusions that can be drawn from this study may be limited because the sample was relatively small and may not be representative of the general TBI population.

Participants were only recruited through organisations providing services for brain injury in the central Auckland region. Those two factors raise the issue of the representativeness of the sample and the generalisability of the findings.

The relatively small overall sample size, and even smaller individual group sizes, created a further limitation by its influence on the power of the relevant statistical analyses employed. Cohen's (1988) convention for categorising small (0.10), medium (0.30), or large effect sizes (0.50) were adopted. Separate post-hoc power analyses, involving sample sizes of 27, 28, and 40, revealed that Chi Square tests had little power to detect even a medium size effect. With one degree of freedom power for $n = 27$ was 0.34, for $n = 28$ power was 0.35, and for $N = 40$ was 0.48. With two degrees of freedom and a total of 40 participants power to detect a medium effect fell to 0.38.

Job satisfaction is a multidimensional concept. For example, workers may feel satisfied with their remuneration package, job description, and their physical work environment, however, they may not be satisfied with the level of supervision, training, and opportunity for advancement. This study did not identify different dimensions of job satisfaction, focusing instead on overall satisfaction. Distinguishing between the major facets of job satisfaction would help to establish areas that TBI individuals generally find most unsatisfying about their post-injury employment, thus would provide valuable information in setting up job placement.

This study relied on self administering questionnaires for the collection of data. Several of the questionnaire items required participants to recall past events. Because memory deficits tend to be common problems following TBI, the accuracy of some of the information obtained may have been compromised. Gathering information from significant others, and outside sources, such as previous employers, may be critical in documenting changes in behaviour relative to premorbid performance. Different interpretations of the same question, such as the question regarding job satisfaction, would also influence participants' responses. Having interviewer-administered questionnaires would ensure that all participants have the same understanding of each item. Interviewer-administered questionnaires may also increase the return rate of the survey.

Conclusions and Recommendations

The present study was conducted because of an apparent need in New Zealand for research specifically on return to work for people with TBI. In spite of the difficulties

encountered in obtaining sufficient participants, thus limiting parametric assessments, the study highlights a number of important points. Not least of these is the urgent attention needed to the area of vocational rehabilitation for an ever increasing TBI population.

There is consensus in the literature that vocational rehabilitation and return to work for the traumatically brain-injured individual is a very challenging process, and that the more severe the injury, the less likely the patient is to return to work. However, success is not necessarily impossible to achieve. Success may depend on continuing research and a commitment on the part of service providers to work together cooperatively towards a common goal. Therefore, all those involved need to view themselves as an integral part of the vocational rehabilitation process, from those in charge of physical recovery (e.g. physiotherapists, speech/language therapists) to those responsible for improving mental health (psychologists, counsellors). If separate service providers see themselves as part of a team, information on individuals' needs and progress can be shared, and the formation of holistic and individualised vocational rehabilitation may be made possible.

A further challenge in achieving positive long term vocational outcome lies in the fact that problems resulting from brain injury do not always completely disappear, and if they do, they do so over a considerable period of time. This fact makes it difficult to set time limits on TBI rehabilitation programmes (Ninomiya et al., 1995). Since financial limitations are a major issue in the provision of long-term programmes, it is important to involve family members in the rehabilitation process. They need to be provided with information and skills useful for dealing with long-term problems. In this way brain-injured individuals may be ensured of continuing support. Even for brain-injured individuals with major and irreversible impairments, social support can improve quality of life (Boak & High 1996). This highlights the importance for practitioners to address psychosocial problems, and to do so in the family context (Smith & Godfrey, 1995).

Obviously injury-related factors have a major influence in predicting outcome following TBI. However, the long-term outcome of TBI will be determined further by the services that are available, and whether or not they correspond to the services that are actually needed (Beals et al., 1990). The provision and promotion of community services for TBI individuals and their families is important. For instance, families

need to know what is available, and where they can obtain support for brain-injured individuals.

The present study does not presume that vocational rehabilitation would explicitly result in paid employment for all TBI individuals. A return to competitive employment must be an important objective in rehabilitation, however it would be regrettable if rehabilitation services were denied to individuals for whom this is not a realistic objective. Out of the 13 individuals who did not return to work post-injury, seven indicated that they were not attempting to go back to competitive employment. Many severely injured individuals do not fit into advertised and pre-written job descriptions (Brantner, 1992). Some individuals may be deemed vocationally nonfeasible because a return to paid employment is not a realistic goal (Ninomiya et al., 1995). Indeed, injury severity and the degree of neuropsychologic deficit, may prevent some individuals from successfully returning to work. However, for some, there may be many other worthwhile aims to be achieved in the direction of attaining a fulfilling and socially active life.

Failure to return to work and to sustain employment may also be influenced by factors such time post injury, age, job type, and part or full-time work. In addition, successful return to work has been found to be influenced by having supportive and flexible employers (Brantner, 1992). The World Health Organisation states that a person's degree of disability does not directly cause that person's degree of handicap, but rather that this relationship is mediated by the person's social support system and by societal attitudes toward disability (Boak & High, 1996). As pointed out by Skord and Miranti (1993) it would be expedient to ensure that components of the vocational rehabilitation programme for an individual have correctly identified that person's emotional, attitudinal, and physical readiness for work, job suitability, and the hours he/she could realistically cope with.

Research on returning to work is a necessary and worthwhile venture because of the great financial expense associated with failure to return to work, and because being involved in a productive activity is central to maintaining self esteem. Increased understanding of TBI and its consequences would enable more effective provision of appropriate services, including treatment, care, therapy, and long-term support for victims. The capacity to predict employment outcome in the early stages of rehabilitation would facilitate future planning by TBI survivors, their families, and the

rehabilitation team, ensuring the most efficient use of available resources (Ponsford et al., 1995).

Despite the exploratory nature of the study and its limitations, future studies could be built on some of the broad ideas that emerged from this examination. In an environment of limited resources, these data should aid in discussions about the appropriate goals and services for various brain injured subgroups, as well as about the timing of appropriate interventions.

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APPENDICES

Appendix A1

Statistical Analyses Results

Variable		Groups Compared	Result
Pre-injury	Job Satisfaction	NE, UR, CE	$\chi^2(2,40) = 1.17, p = .556$
	Job Performance	NE, UR, CE	$\chi^2(2, 40) = 0.01, p = .991$
	Job Importance	NE, UR, CE	$\chi^2((2, 40) = 0.65, p = .722$
	Help Received	NE, UR, CE	$\chi^2(2, 40) = 2.31, p = .315$
Post-injury	Job Satisfaction	UR, CE	$\chi^2(1, 27) = 0.28, p = .591$
	Job Performance	UR, CE	$\chi^2(1, 27) = 0.46, p = .494$
	Job Importance	UR, CE	$\chi^2(2, 40) = 9.92, p = .007$
	Help Received	NE, UR, CE	$\chi^2(2, 40) = 9.54, p = .008$
	Help Received	NE, CE	$Z = -3.12, p = .001$
	Help Received	NE, UR	$Z = -1.74, p = .087$
	Help Received	UR, CE	$Z = -1.05, p = .300$
	Importance of Help	NE, UR, CE	$\chi^2(2, 40) = 7.67, p = .021$
	Importance of Help	NE, CE	$Z = -2.49, p = .011$
	Importance of Help	UR, CE	$Z = -1.67, p = .103$
	Importance of Help	NE, UR	$Z = -.05, p = .98$
	Job-Ability Match	UR, CE	$\chi^2(1, 27) = 3.81, p = .05$
Pre- and Post-injury Comparison			
	Job Satisfaction	UR, CE	$S = 82, p = .046$
	Job Performance	UR, CE	$S = 130, p = .000$
	Job Importance	NE, UR, CE	$S = 192, p = .005$
Single or Partnered Comparison			
Pre-injury	Job Satisfaction	NE, UR, CE	$\chi^2(1, 40) = 0.018, p = .891$
	Job Performance	NE, UR, CE	$\chi^2(1, 40) = 1.331, p = .248$
	Job Importance	NE, UR, CE	$\chi^2(1, 40) = 1.830, p = .176$
Post-injury	Job Satisfaction	UR, CE	$\chi^2(1, 27) = 0.530, p = .466$
	Job Performance	UR, CE	$\chi^2(1, 27) = 4.137, p = .041$
	Job Importance	NE, UR, CE	$\chi^2(1, 40) = 1.593, p = .206$

NE = Not-Employed

UR = Unsuccessful-return

CE= Currently-employed

Appendix A2: Invitation Sheet



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Appendix A2

A L B A N Y

A survey of the employment status of people with Traumatic Brain Injury

An Invitation

My name is Tiina Alit, and I am a graduate student at Massey University. I have an interest in brain Injury that developed as a result of my employment at rehabilitation centres. In keeping with my interest, and as part of the requirement towards the completion of a Masters degree, I am conducting a study on the employment of people with brain injury. I would like to invite you to take part in this study.

Those of you who wish to participate will be required to complete a questionnaire that requests information about the work you used to do before your injury, and what you do now. You may take the questionnaire home, and take as long as you need to complete and return it. We expect it to take about 45 minutes. We also seek your permission to have your employer complete a separate questionnaire. If you are not currently working or do not wish your employer to complete a questionnaire, your own participation would still be greatly appreciated.

The details you and your employers provide will add to the pool of information available to individuals and agencies interested in providing the best possible advice and assistance to accident victims returning to work, and those who employ them.

If you are interested in participating in this study, please pick up a pack from your rehabilitation centre. The pack contains a more detailed information sheet, the questionnaires, and a consent form for you to sign. Alternatively, if you would like to, please feel free to contact me directly at the phone number below. If you live outside of the Auckland free calling area, please feel free to telephone collect. Thank you for taking the time to consider.

Tiina Alit

Telephone Number: (09) 419 0671 or 025 732 392

Appendix A3: TBI Information Sheet

Consent Form

Instruction Sheet

TBI Questionnaire

Should you wish to obtain a copy of the results of the study once it is completed please feel free to contact the researcher at the telephone number above.

This study has received ethical approval from the North Health Ethics Committee.

Please feel free to contact the researcher if you have any questions about this study.

If you have any queries or concerns regarding your rights as a participant in this research you may contact the Health Advocates Trust, phone 623 5799.



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A L B A N Y

Questionnaire No.....

A Survey of the Employment Status of People With Traumatic Brain Injury

Consent Form

I have read and understand the information sheet for volunteers taking part in the study designed to gather information about people with Traumatic Brain Injury and employment. I have had the opportunity to discuss this study. I am satisfied with the answers I have been given.

I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time and this will in no way affect my future/continuing health care.

I understand that my participation in this study is confidential and that no material which could identify me will be used in any reports on this study.

I have had time to consider whether to take part.

I know who to contact if I have any questions about the study

I wish to receive a copy of the results **YES/NO**

I DO/DO NOT (please circle your option)
give permission for the researcher to obtain my coma details.

I have seen the questionnaire prepared for my employer to complete.

I DO/DO NOT (please circle your option)
give permission for it to be used with my employer or an agreed representative of my employer.

I _____ (full name) hereby consent to take part in this study.

Signature: _____

In my opinion consent was given freely and with understanding

Witness' name (please print)

Witness' signature

Date:

If you have any concerns about the nature of the study, you may contact:

Dr. Dave Clarke
Head of Section, Psychology
Massey University, Albany Campus.
Telephone number: (09) 443 9664

Any general questions about the study (e.g. procedures, instructions, etc.) should be directed to the researcher or the supervisor.

Full name of Researcher: Tiina Alit **Research Supervisor:** Dr. Jennifer Stillman

Return To Work Questionnaire

Instructions

Please fill in the accompanying questionnaires as you are able, it will take about 45 minutes to complete. You have the right not to complete the questionnaire, or to leave any questions or sections blank.

You may correct your answers if, when you have read them over, you wish to do so.

In some cases examples are given in brackets after some of the questions. These are examples only. Please give whatever responses seem appropriate to you, even if they are not among the examples provided.

Where the question asks you to respond on a scale similar to the one below, put a vertical line through it to represent your opinion.



For example, suppose you were asked whether you considered yourself to be short or tall. If you judged yourself to be midway between average height and very tall, you might mark the scale as shown.



If you have given permission for the Employer Questionnaire to be used, please address the stamped envelope labeled “**Employer Pack**” and send it to your employer.

If any part of the instructions remains unclear to you, please do not hesitate to contact the researcher.

RETURN TO WORK QUESTIONNAIRE

Personal Details

Age:

Marital status:

Number of dependent children:

Ethnicity:

Date of accident:

Male

Female

Pre-accident details

1. What was your employment status **at the time of your accident?**
(Please tick)

Self employed

Employed

Student

Unemployed

Other (please state) _____

2. Was the last job you had before your accident

Full time

or

Part-time

If you worked part-time:

How many hours per week did you work

7. Indicate on the line below how satisfied you were with the job you had before your accident.

|-----|

not satisfied completely satisfied

8. How would you rate your overall performance in the job you had before your accident.

|-----|

poor excellent

9. Indicate on the line below how important having a job was to you personally.

|-----|

not at all important very important

10. Which of the daily household duties did you carry out prior to your accident?

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Cooking | <input type="checkbox"/> Gardening |
| <input type="checkbox"/> Cleaning | <input type="checkbox"/> Child-care |
| <input type="checkbox"/> Shopping | <input type="checkbox"/> House maintenance |

Others (please list) _____

11. Indicate on the line below how much help you usually had with household jobs.

|-----|

very little a great deal

12. Did you suffer from any ongoing medical conditions that affected your work performance before your accident?

Yes

No

If "Yes", please list what they are.

RETURN TO WORK QUESTIONNAIRE

Post accident details

All of the following questions refer to your situation after your accident

13. Which of the following rehabilitation programmes did you receive after your accident?

Counselling

Physiotherapy

Speech therapy

Occupational therapy

Others (please list) _____

14. How long after your accident did you begin the programmes?

15. List any rehabilitation programmes you still attend.

Please continue with the questionnaire as instructed below.

If you are **currently working** please continue by filling out the Yellow Forms only.

If you are **not currently working, but have worked at some stage after your accident** please continue by filling out the Blue Forms only.

If you have **not worked since your accident** please continue by filling out the Green Forms only.

RETURN TO WORK QUESTIONNAIRE

Complete this form if you are currently working

16. How long after your accident did you first return to work?

17. Is this the only job you've had since your accident?

Yes

No

If "No" why did you leave the other jobs?

18. Is the job you have now with the same employer as before your accident?

Yes

No

19. How long have you had this job?

20. If your current job is different to the one you had before your accident, would you prefer to return to the same kind of job you used to have?

Yes

No

If "Yes", are you receiving, or have you received any professional assistance or advice specifically to help you return to the same kind of job as you used to have?

Yes

No

21. Is your current job

Full time

or

Part time

22. If part time, how many hours per week do you work?

23. Approximately, how many people work where you are employed?

Less than 20

Between 20 and 30

More than 30

24. Do you have an official title at work? If you do, what is it?

25. Describe what you do on a normal work day at your job.

26. Indicate on the scale below how satisfied you are with your present job.

|-----|

not satisfied completely satisfied

27. How would you rate your overall performance in your current job?

|-----|

poor excellent

28. How well do you feel your current level of ability is suited to your present job?

|-----|

job much too easy job much too hard

29. List any factors that make it difficult for you to perform well at work.

Fatigue

Concentration problems

Memory problems

Physical limitations

Others (please list) _____

30. Indicate on the line below the importance you attach to being employed.

not at all important

very important

31. List any difficulties you encountered (if any) in trying to find work after your brain injury (for instance did you have difficulties in searching for vacancies such as reading the paper, coping with interview, getting to interview, etc.).

32. Which of the daily household duties do you have assistance with?

Cooking

Gardening

Cleaning

Child-care

Shopping

House maintenance

Others (please list) _____

33. Indicate on the scale below how much help you usually receive with household jobs.

very little

a great deal

34. Who is the main provider of assistance to your daily needs

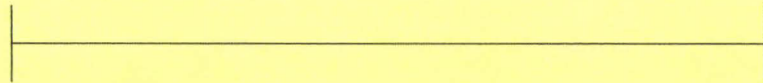
partner/spouse

other family member

paid help

no assistance

35. How important for your work performance is having assistance for daily living?



it is unnecessary

it is essential

36. What do you consider the most helpful actions or attitudes your family can have to make a return to work as easy as possible?

37. What do you consider the most helpful actions or attitudes other employees can have to smooth the way for people returning to work after a head injury?

38. What advice can you offer to help employers of people in your position to understand and meet the needs head injured employees?

39. List any aspects of your current working situation you would change if you could.

40. What would you like to say to other accident victims that would help prepare them for the experience of returning to work?

41. Did you receive any assistance completing this questionnaire?

Yes

No

RETURN TO WORK QUESTIONNAIRE

Complete this form if you are not currently working, but did work at some stage after your accident

16. How long after your accident did you first return to work?
17. If you worked at more than one place after your accident, what are some of the reasons for leaving those jobs?
18. Did you return to work with the same employer as before your accident
- Yes No
19. How long did you stay in the last job you had **after** your accident?
20. Are you hoping to return to the same kind of job you used to have before your accident?
- Yes No

21. Are you receiving/have you received any professional assistance or advice specifically to help you return to work?

Yes

No

22. In the last job you had **after** your accident, did you work

full time

or

part time

23. If you worked part time, how many hours per week did you work?

24. Approximately, how many people worked where you were employed?

Less than 20

Between 20 and 30

More than 30

25. Did you have an official title at your last job? If you did, what was it?

26. Describe what you used to do on a normal work day at your last place of work.

27. Indicate on the scale below how satisfied you were with the last job you had.

not satisfied completely satisfied

28. How would you rate your overall performance in your last job?

poor excellent

29. How well did you feel your level of ability was suited to your last job?

job much too easy job much too hard

30. List any factors that made it difficult to perform well on the job

Fatigue

Concentration problems

Memory problems

Physical limitations

Others (please list) _____

31. Indicate on the line below the importance you attach to being employed

|-----|

not at all important very important

32. List any difficulties you encountered (if any) in trying to find work after your brain injury (for instance did you have difficulties in searching for vacancies such as reading the paper, coping with interviews, getting to interviews, etc.)

33. Which of the daily household duties do you have assistance with?

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Cooking | <input type="checkbox"/> Gardening |
| <input type="checkbox"/> Cleaning | <input type="checkbox"/> Child-care |
| <input type="checkbox"/> Shopping | <input type="checkbox"/> House maintenance |

Others (please list) _____

34. Indicate on the scale below how much help you usually receive with household jobs.

|-----|

very little a great deal

35. Who is the main provider of assistance to your daily needs

partner/spouse

other family member

paid help

no assistance

36. How important do you feel having assistance for daily living was to your job performance?



it is unnecessary

it is essential

37. What do you consider the most helpful actions or attitudes your family can have to make a return to work as easy as possible?

38. What do you consider the most helpful actions or attitudes other employees can have to smooth the way for people returning to work after a head injury?

39. What advice can you offer that would help employers to understand and meet the needs of their head injured employees?

40. What would you say to other accident victims that would help prepare them for the experience of returning to work?

42. Did you receive any assistance completing this questionnaire?

Yes

No

RETURN TO WORK QUESTIONNAIRE

Complete this form if you are not currently working

16. Are you attempting to return to work?

Yes

No

17. Are you hoping to return to the same kind of job you used to have before your accident?

Yes

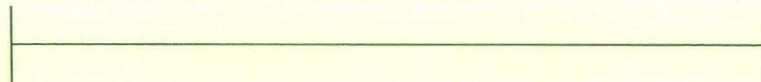
No

18. Are you receiving/have you received any professional assistance or advice specifically to help you return to work?

Yes

No

19. Indicate on the line below the importance you attach to being employed.



not at all important

very important

20. List any difficulties you encountered (if any) in trying to find work after your brain injury (for instance did you have difficulties in searching for vacancies such as reading the paper, coping with interviews, getting to interviews, etc.)

21. Which of the daily household duties do you have assistance with?

Cooking

Gardening

Cleaning

Child-care

Shopping

House maintenance

Others (please list) _____

22. Indicate on the scale below how much help you usually receive with household jobs.



23. Who is the main provider of assistance to your daily needs

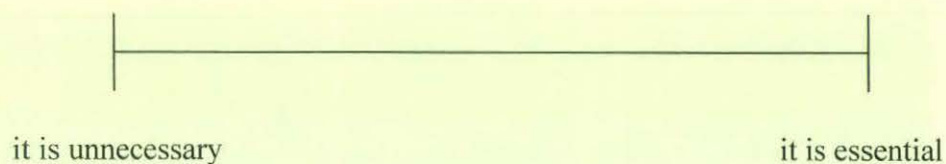
partner/spouse

other family member

paid help

no assistance

24. How important do you feel having assistance for daily living would be for your job performance?



25. What do you consider the most helpful actions or attitudes your family can have to make a return to work as easy as possible?

26. What do you consider the most helpful actions or attitudes other employees can have to smooth the way for people returning to work after a head injury?

27. What advice can you offer that would help employers to understand and meet the needs of their head injured employees?

28. What would you say to other accident victims that would help prepare them for the experience of returning to work?

29. Did you receive any assistance completing this questionnaire?

Yes

No

Appendix A4: Employer Information Sheet
Employer Questionnaire



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A L B A N Y

DEPARTMENT OF PSYCHOLOGY

A survey of the employment status of people with Traumatic Brain Injury.

Employer Information Sheet

Principal Investigator: Tiina Alit

Tel. number: (09) 419 0671

Supervisor: Dr. Jennifer A. Stillman

Tel. Number: (09) 443 9770

I am gathering information on the employment of people who have sustained brain injury. This work is being carried out towards a Master of Arts degree. The study is independent of any rehabilitation centres or organisations providing services to people with brain injury.

The enclosed questionnaire is being sent to you with permission of your employee or past employee, who has agreed to participate in the research. Your participation is entirely voluntary. You have the right not to take part, or to withdraw your participation at any time before data collection is complete, without having to give reason. If you choose not to participate your decision will not nullify the contribution made to the study by your employee or past employee.

You will be provided with a stamped addressed envelope in which to return your completed questionnaire. Please note that your completed questionnaire will be made available to your employee or past employee should he or she request to view it.

It is assumed that filling in the questionnaire implies consent.

Your participation in this study is confidential, neither your employee nor your organisation will be identified in any report arising from the research.

This study has received ethical approval from the North Health Ethics Committee.

Please feel free to contact the researcher if you have any questions about this study.

If you have any queries or concerns regarding your rights as a participant in this research you may contact the Health Advocates Trust, phone 623 5799.

RETURN TO WORK FOLLOWING BRAIN INJURY
EMPLOYERS QUESTIONNAIRE

It is assumed that filling in the questionnaire implies consent

1. What is (was) the official title of the employee?

2. What general duties is the employee expected to perform on normal working day?

3. Did the person whom you have employed following a head injury work for your organisation prior to the injury

Yes

No

If 'No', go on to question 6.

4. What was the employee's official designation before the accident?

5. What general duties did he or she perform on a normal working day prior to the accident?

6. If your employee did not previously work for you prior to his or her head injury, what was the method of recruitment used (word of mouth, newspaper advert, employment agency...)?

7. As an employer, would you have appreciated more advice, or assistance in integrating, or reintegrating, the employee into the workplace?

