TRAUMATIC BRAIN INJURY IN THE CRIMINAL JUSTICE SYSTEM: IDENTIFICATION AND RESPONSE TO NEUROLOGICAL TRAUMA

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A causal relationship between neurological trauma and criminality has yet to be established, but a correlation does appear to exist. It is estimated that as many as 87% of incarcerated individuals have experienced a traumatic brain injury. These injuries often are associated with behavioral and personality changes such as depression, anxiety, substance abuse, and aggression. This population also experiences higher rates of cognitive deficits such as memory loss and difficulty maintaining attention following their injuries. Traumatic brain injury currently is not being addressed on a wide scale within the justice system. This has created difficulties for this population as incarcerated individuals with head injuries frequently receive longer sentence lengths, have more rule infractions, and recidivate at higher rates than their peers. This article describes the unique challenges confronting this population while incarcerated and what changes can be made by correctional entities to help this group more successfully reintegrate into society.

Keywords: traumatic brain injury, acquired brain injury, criminal justice, incarcerated individual

Traumatic Brain Injury (TBI) is relatively rare in the United States' general population. About 2.5 million Americans suffer from a TBI each year, which is less than 1% of the population (Centers for Disease Control and Prevention [CDC], n.d.a). However, the rate for incarcerated individuals is much higher. Juvenile offenders were found to be 3.38 times more likely to sustain a TBI than similarly matched control groups (Farrer, Frost, & Hedges, 2013). About 25-87% of the adults who are being held in secure custody, such as jails and prisons, have sustained a TBI at some point in their lives (Admire & Mitchell, 2010; Health Resources and Service Administration [HRSA], 2011; Piccolino & Solberg, 2014; Ray, Sapp, & Kincaid, 2014; Slaughter, Fann, & Ehde, 2003). Rates of TBI are estimated to be as high as 100% among incarcerated adults and juveniles who have received the death penalty (Freedman & Hemenway, 2000; Hughes et al., 2015). Given the high prevalence of TBIs in incarcerated populations, it is important to know how these individuals are affected by complicated, mild TBIs, as well as moderate and severe TBIs. Uncomplicated,

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mild TBIs will not be discussed as these typically heal quickly without lasting, negative effects and without the need for special interventions (Greiffenstein, 2013).

EXPLORING TBI

Traumatic Brain Injuries can occur after an individual receives damage to the head. During the initial blow to the head, the brain receives damage from the direct impact and from colliding with the skull. This primary injury results in damage to the soft tissue of the brain (Coetzer, 2010) that cannot be negated even when TBIs are quickly identified (Gean, 2014). Commonly cited causes of brain injury include car accidents, physical altercations, and falls. Child abuse and neglect is also a common cause of TBIs sustained during infancy (Keenan et al., 2003).

The damage that the brain sustains does not end with the damage inflicted upon the soft tissue (primary injury). Following a primary injury, the brain also becomes susceptible to secondary injuries. These are the chemical changes that begin to take place in the brain as a result of the injuries sustained. For example, lack of oxygen getting to the brain after an injury could coincide with pressure being put on the brain due to internal bleeding (Coetzer, 2010). The secondary injury usually manifests within 24 hours of the primary injury and, if the patient receives appropriate medical interventions, can be preventable (Gean, 2014).

While secondary injuries can be prevented, this is only possible when the primary injury is identified. In assessing the nature and severity of a possible TBI, physicians consider whether or not the individual was rendered unconscious, has experienced memory loss or changes in mental state, or has suffered impaired neurological functioning (Silver, McAlister, & Yudofsky, 2011). Physicians are more likely to see patients with more severe symptoms as those individuals are more likely to seek treatment than individuals with milder symptoms. This is a concern since a single TBI makes an individual twice as likely to experience a second TBI, and a second TBI makes an individual eight times as likely to sustain a third TBI (Gualtieri & Cox, 1991). The consequences of multiple injuries could be severe as even multiple mild TBIs can have the same negative side-effects as a single severe TBI (Diamond, Harzke, Magaletta, Cummins, & Frankowski, 2007). If several mild TBIs are sustained within a short time frame (e.g., a matter of weeks) the individual can even die as a result of their injuries (CDC, n.d.b).

In addition to the severity, the location of the TBI affects whether or not an individual will present for treatment. The frontal lobes are an area in the brain that frequently are damaged as a result of a TBI (CDC, 2014). The frontal lobes are responsible for executive functioning, emotional regulation, and behavioral control (Stuss, 2011). The symptoms associated with frontal lobe damage are often more noticeable than when damage is sustained elsewhere in the brain, and severe damage may interfere with the patient's daily functioning. These patients with frontal lobe damage exhibit higher levels of aggression, act more impulsively, experience increased irritability, struggle to accurately predict emotions in others, and have difficulty imagining situations from another person's perspective (Blair &

Cipolotti, 2000; Brower & Price, 2015; Silver et al., 2011). While interacting with others, particularly family members, these personality changes become apparent as the patient begins to display symptoms such as difficulty concentrating on conversations or exhibiting aggressive behaviors. In such cases the patient often seeks treatment after recognizing the changes in the personality or at the urging of loved ones who have noticed the changes.

The damage that is inflicted by TBIs is particularly problematic for those who are most likely to experience them, specifically 15 to 25 year olds (Fleminger & Ponsford, 2005), as their brains often still are developing when the injury is inflicted. This damages normal brain growth which similarly affects emotional and cognitive development. This is a time of transition when adolescents begin to go through a number of life changes, including choosing whether or not go to college, to become involved in a romantic relationship, and to change residences. Depending upon the severity of the TBI, these typical changes can be difficult, or even impossible, for this population to accomplish. These negative consequences combine to leave the TBI population vulnerable to negative life events. This vulnerability, combined with increased aggression and impulsivity, increases the likelihood of these individuals coming into contact with the criminal justice system. Up to 83% of offenders sustained a TBI prior to becoming involved with the legal system (Sarapata, Herrmann, Johnson, & Aycock, 1998). Additionally, one-third of men and 25-42% of women who are incarcerated sustained TBIs prior to turning 16-years-old (Ferguson, Pickelsimer, Corrigan, Bogner, & Wald, 2012; Hawley & Maden, 2003). They also face the risk of sustaining multiple TBIs since it has been found that between 13% and 45.8% of juveniles who are involved with the criminal justice system have sustained two or more TBIs (Hughes et al., 2015).

Other groups that are at-risk of sustaining TBIs include drug users and African Americans (Bjork & Grant, 2009; Schofield et al., 2006a; Shiroma et al., 2010). Soldiers are also more likely to experience a head injury with as many as 20% having experienced a TBI (Gean, 2014). It is difficult to discern whether men or women are at greater risk of sustaining a TBI as the majority of the research conducted involved only male populations. Groups that are at risk of sustaining TBIs from violent altercations include males, minorities, those without a high-school diploma or GED, individuals who are single, and people who are unemployed (Bogner, Corrigan, Mysiw, Clinchot & Fugate, 2001). Among juveniles, however, ethnicity has not been shown to be a significant factor in the incidence of traumatic brain injuries (Hughes et al., 2015). Genetics and environments also can increase the chances that individuals will come in contact with the legal system after sustaining a TBI. Individuals who have parents or other immediate relatives with substance abuse issues are themselves more likely to become users as they mature (American Psychiatric Association [APA], 2013). This places them at greater risk of being injured while using substances. Similarly, the environment in which individuals live can place them at great risk of receiving a blow to their head. In areas where there is a high amount of violence, an individual is far more likely to engage in, or become the victim of, physical altercations. Such persons also may be more likely to engage in risky behaviors, such as drug usage when such substances are readily available.

TBI IN A PRISON POPULATION

Although incarcerated individuals have higher rates of TBIs, it is difficult to identify how many people actually have sustained such an injury. There are multiple working definitions for TBI (Menon, Schwab, Wright, & Maas, 2010). Without a standard definition it is difficult to accurately classify people in lockup in a systematic fashion. Additionally, there is currently no standard screening process for TBI across states or within the federal corrections system (HRSA, 2011). Many correctional entities, particularly jails, fail to utilize even basic screening instruments because of limited funding, lack of awareness about TBI among administration, limited staff, and high population turnover among inmates. In rare instances where screening tools are used there has been a wide variety in what assessment methods are employed, how information is gathered, and what is done with that information.

While it has been difficult to find accurate rates of TBI among incarcerated individuals, there has been some success in identifying the origins of their injuries. Non-delinquent youth sustain TBIs primarily from sporting events, while commonly cited causes of TBI among the incarcerated juvenile population include sports injuries, falls while under the influence of drugs, motor vehicle accidents, and physical altercations (Farrer et al., 2013; Ray et al., 2014; Williams, et al., 2010a). Among incarcerated adults, these factors along with explosions, gang fights, and substance abuse, account for the majority of TBIs (Barnfield & Leathem, 1998; Ray et al., 2014; Schofield et al., 2006b; Schofield, Butler, Hollis & D'Este, 2011; Williams & Evans, 2003; Williams et al., 2010b). These causes suggest that many individuals within the correctional system who have a history of TBI already were engaging in risky or illegal behaviors prior to sustaining their injury.

Few incarcerated individuals (between 28.5-37%) seek medical attention prior to being arrested (Ray et al., 2014; Schofield et al., 2011), possibly because their TBIs negatively have affected their relationships (Barnfield & Leathem, 1998; Jorge et al., 1993; Schofield et al., 2006b). This means that affected individuals may not have others upon which to rely to point out difficulties that they are having as a result of their TBIs. Without others to draw attention to these problems, many people lack enough self-awareness to recognize their own difficulties (Baldry, Clarence, Dowse, & Trollor, 2013; Ownsworth, McFarland, & Young, 2002; Williams & Evans, 2003). In other cases, the cost of neurocognitive assessments may mean that care is cost-prohibitive (Leon-Carrion & Ramos, 2003; Walker, Staton, & Leukefeld, 2001) as a CT scan can range anywhere from $310 to $508, and an MRI can range from $615 to $881 (Healthcare Bluebook, 2015). When this population does seek medical attention, it typically is the result of a physical altercation or multiple TBIs in the past (Henning, Frangos, Simon, Pachter, & Bholat, 2015; Walker et al., 2001). Unfortunately, even when treatment is sought, the cognitive deficits that frequently accompany head injuries can lead to the TBI being misdiagnosed as a learning disability (HRSA, 2011). This ultimately harms both the patient and society since prompt medical attention could help curtail later illegal activities (Sarapata et al., 1998).

PERSONALITY, AFFECT, AND BEHAVIORAL CHANGES

There are many physical and mental changes that individuals can experience following a TBI. Physically, individuals may experience structural damage to the brain and a reduction in mobility. After experiencing a TBI it is not uncommon for people to partially or completely lose their ability to move their limbs (Mumford & Wilson, 2009). They also can experience symptoms such as being unable to control their muscle movements and falling due to losing their balance (Walker & Pickett, 2007). Mentally they may have to endure changes such as poor concentration or memory. The likelihood that a person will receive a psychiatric diagnosis is also more elevated after a TBI (Ray et al., 2014), with the most commonly diagnosed mental health disorders being depression, substance use (Admire & Mitchell, 2010), and anxiety disorders (Williams & Evans, 2003). In addition to the difficulties that accompany these diagnoses, many individuals also experience shifts in their mental state such as a being less satisfied with the quality of their life (Elliot & Underhill, 2009). Specific symptoms, typically anger and aggression, also increase during this time. While these symptom patterns are more likely to follow a moderate or severe TBI, they can begin to manifest as a person begins to acquire multiple mild TBIs (Ferguson et al., 2012).

Depression. An individual who sustains a single, mild TBI is likely to suffer few obvious lasting negative side-effects. In spite of this, it has been found that even a mild TBI is associated with greater levels of depression and anxiety (McCrea, 2007). Among individuals with a severe TBI it has been found that as many as 53% meet criteria for Major Depressive Disorder during the first year after they sustain their injuries. Usually the depressive symptoms are evident within three months of the injury (Bombardier et al., 2010). Depression among TBI positive individuals has been associated with poorer return to pre-injury levels of functioning, pain and discomfort, poor physical health, and an inability to perform tasks that were once part of their regular lives (Bombardier et al., 2010; Schofield et al., 2006b; Wood & McMillan, 2001). During this time many individuals with depression experience a loss of independence due to physical limitations caused by their injuries. Additionally, individuals with TBIs are more likely to report being depressed when they lack social relationships with friends and loved ones (Hart et al., 2012). This leaves this population with few people they can depend upon for help during a period when they need assistance. For many, this decrease in social support has been found to correlate with lower levels of self-esteem, increased feelings of hopelessness, and poor self-ratings of their quality of life (Bombardier et al., 2010; Fleminger & Ponsford, 2005; Jorge et al., 1993; Sarapata et al., 1998; Silver, Kramer, Greenwald, & Weissman, 2001). Eventually depressive symptoms can become severe enough for TBI positive individuals that they begin engaging in self-harming behaviors and suicidal ideation at increased levels (Gunter, Philibert, & Hollenbeck, 2009).

Anxiety. Anxiety disorders are similar to depression in that they commonly are experienced by individuals following TBIs (Ashman et al., 2004b; Gunter et al., 2009; McCrea, 2007). Among individuals incarcerated in a jail within a year of their TBIs, 40% reported experiencing generalized anxiety disorder, and 21% reported an unspecified anxiety disorder (Slaughter et al., 2003). This is compared to 2.9% of Americans in

the general population who are diagnosed with generalized anxiety disorder (APA, 2013). Individuals with long-term depression after a TBI reported experiencing a greater number of anxiety symptoms such as worrying, feelings of foreboding, and nervousness (Jorge et al., 1993). Anxiety levels increase following a TBI when an individual has to readjust to their new levels of functioning (Williams & Evans, 2003). Two complications that often are associated with depression and anxiety include an increase in aggression and substance abuse usage.

Substance abuse. The relationship between TBI and substance abuse is complicated. Rather than thinking of it in a single direction, it is more accurate to think of this as a bidirectional relationship where both TBI and substance abuse contribute to one another (Bjork & Grant, 2009; Bogner et al., 2001). Abusing alcohol and drugs increase the risk of obtaining a TBI (Barnfield & Leathem, 1998; Bjork & Grant, 2009; Ponsford, Whelan-Goodinson, & Bahar-Fuchs, 2007; Schofield et al., 2006a; Williams & Evans, 2003). Drug use, particularly marijuana, is also higher among incarcerated individuals who have sustained a TBI (Williams et al., 2010b). This often makes it difficult to predict accurately whether the substances contributed to the TBI, or if the TBI was a catalyst for substance usage.

As many as 51% of incarcerated individuals with TBIs, as compared to 31% without TBIs, engaged in substance abuse. Most incarcerated individuals with TBIs endorse using multiple drugs at the same time (Schofield et al., 2006a). The drug this population reports using most frequently is marijuana, and they report using marijuana at significantly higher rates than their peers with no past history of TBIs (Williams et al., 2010a). The rate at which this population uses substances is alarming since only 9.4% of Americans reported using drugs in 2013 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). Unfortunately, no direct comparison substance abuse rates between incarcerated individuals with TBIs and non-incarcerated individuals with TBIs were found, so the differences between these populations are unknown.

When someone begins (or continues) using substances after they experience a TBI, it is likely that they will receive a mental health diagnosis (Admire & Mitchell, 2010). This becomes a complicated relationship since each element in this triad (TBI, mental health diagnoses, and drug usage) can exacerbate the effects of the others. For instance, drug usage negatively affects return to pre-injury functioning by compounding the negative effects of brain injuries (Bjork & Grant, 2009; Walker et al., 2001). Similarly, individuals with TBI who use drugs report being less satisfied with their lives than those who abstain from using substances (Bogner et al., 2001). This dissatisfaction then can contribute to greater levels of depression and anxiety.

Anger/Aggression. Multiple studies have found that individuals who experience a TBI are more likely to become angry and act out on their hostile feelings. The question of whether the TBI causes the anger or merely coincides with it has yet to be adequately answered. Similar to substance abuse, the relationship between TBIs and aggression is likely bidirectional. For instance, increased levels of anger and anti-social behavior prior to a

TBI are a greater indication of post-TBI violence than the injury itself (Turkstra, Jones, & Toler, 2003). Neurological deficits, such as reduced restraint, caused by the injury correlate with an increase in post-injury violence (Leon-Carrion & Ramos, 2003). Similarly, aggression often has been found to increase as impulsiveness increases among individuals with TBIs (Dyer, Bell, McCann, & Rauch, 2006). Sustaining multiple TBIs also can increase the likelihood that a person will begin to act violently. Incarcerated individuals who had sustained a TBI within the previous year were more likely to self-report as being angry or aggressive (Schofield et al., 2006b). In instances when TBI positive individuals have disorders, such as substance abuse, and symptoms, such as aggression, it is important to be able to identify whether or not all of the mental health needs are being addressed concurrently. Unfortunately, there is a lack of research that identifies whether or not TBI-positive, incarcerated individuals are receiving services for more than one diagnosis at a time.

HOW TBIS AFFECT BEHAVIOR INSIDE OF PRISONS AND INCREASE RATES OF CONFINEMENT

The unfortunate reality for many individuals with TBIs is that they may not have the cognitive skills necessary to help them understand the negative consequences that could result from their actions (Kelly & Winkler, 2007). This means that the threat of incarceration is not an effective deterrent since it is likely that such individuals may not consider possible consequences at the time of their actions. This appears to be true even after such consequences are endured as inmates with TBI have higher rates of reoffending than their peers (Ray et al., 2014; Williams et al., 2010b). Experiencing multiple TBIs increase an individual's risk of coming in contact with the justice system, and individuals who have experienced TBIs are more likely to be convicted of a violent offense than incarcerated individuals without TBIs (Schofield et al., 2015; Williams et al., 2010b). Additionally, multiple TBIs have been shown to correlate with higher conviction rates (Farrer et al., 2013).

One of the glaring differences between those involved in the justice system with TBIs and their non-head injured counterparts is the length of the sentences they receive, as inmates who have TBIs receive longer sentences (Ray et al., 2014; Williams et al., 2010a). It may be that the symptoms they experience as a result of their TBIs render them incapable of contributing to their own defense (Sarapata et al., 1998), but individuals with TBIs commit offenses that are more violent than their peers (Hawley & Maden, 2003). Another possible explanation could be that, due to this population's higher rates of recidivism, the courts are less inclined to show them leniency than their non-head injured counterparts. Once sentenced, individuals with untreated TBI serve more time than their peers (Shiroma et al., 2010). TBI patients in involuntary treatment facilities have been denied release at statistically higher rates than those without head injuries due to fears that they will pose a risk to the community if released (Hawley & Maden, 2003). If this is true for prisoners as well, then this could mean that they serve longer sentences due to receiving parole less often and less quickly than other inmates.

While they are incarcerated, individuals with TBIs experience ongoing symptoms from their TBIs (Ferguson et al., 2012). Commonly cited difficulties experienced by this

population during their incarceration include problems concentrating, poor reading comprehension, struggles in understanding conversations, not following instructions, increased irritability, low emotional regulation, poor memory, and distractibility (Johnson & Enge, 2013; Schofield et al., 2006a; Williams et al., 2010ab). Sometimes these TBI symptoms are so severe that these individuals are unable to respond to directions and must have help initiating tasks (Kelly & Winkler, 2007). Incarcerated individuals who have higher IQs appear to be more capable of recognizing these problems and controlling their behaviors. Those who do not recognize the negative symptoms, such as memory deficits and increased aggression levels, that they experience as a result of their TBIs typically encounter more difficulties since they are unable to prepare for and identify potential problems that could result from their symptoms (Ownsworth et al., 2002). This is especially important for individuals with TBIs as they generally have lower intellectual abilities than peers who have not sustained TBIs.

Incarcerated individuals with TBIs, both treated and untreated, have more rule infractions than their peers (Piccolino & Solberg, 2014; Shiroma et al., 2010). Males in this population are 86% more likely to have rule infractions (both violent and non-violent) during their time in lockup than their counterparts. Incarcerated females who have a TBI are 144% more likely to have violent infractions than their peers. The risk that this population poses can grow into a larger safety problem when they have poor cognitive functioning as a result of their injury and are physically larger and stronger (Kelly & Winkler, 2007).

RECOMMENDED CHANGES FOR ADDRESSING TBI WITHIN THE CRIMINAL JUSTICE SYSTEM

In 1996 the HRSA, which is a part of the United States Department of Health and Human Services, began focusing specifically on how to better assist individuals with TBI ("Traumatic Brain Injury Program," n.d.). This ultimately led to grants being offered to criminal justice entities so that they could begin better serving this population. To date, the only state to benefit from this grant and implement its standards statewide is Minnesota (HRSA, 2011). Minnesota has used these funds to attempt to identify individuals in custody who have TBI, train correctional staff about TBI, and successfully reintegrate this population into society (Johnson & Enge, 2013). This has helped create a framework for states to begin creating better treatment programs for TBI patients in prison as well as in the community.

Unfortunately, not every state has made policy changes to address TBI among incarcerated individuals. Many people who have sustained a TBI do not receive appropriate treatments. In the general population, it has been found that as few as 10% of TBI sufferers receive the mental health treatment that they need (Gunter et al., 2009), putting untreated individuals at greater risk for criminal activity. Quickly identifying and treating TBIs within children and teenagers reduces the chances of them committing crimes later in life (Williams et al., 2010b). Unfortunately, prompt responses are not always possible. In cases when services cannot be provided promptly after the injury, there is still hope for the injured party. Treating TBI within prison reduces recidivism rates and helps the criminal

justice system reduce the number of individuals within their care (Korb, 2011; Slaughter et al., 2003).

Assessment. The first step toward properly identifying and addressing TBI within a prison population is identifying its presence. Institutions could begin screening incarcerated individuals for TBI upon their entry into the criminal justice system. A simple, cost-effective approach that correctional institutions can utilize when first attempting to identify TBIs involves self-report screeners (Ashman, Schwartz, Cantor, Hibbard & Gordon, 2004a). This population is able to accurately and honestly report their TBI history (Schofield et al., 2011), although in some instances the incarcerated individual may be unable to accurately report TBI symptoms due to a lack of self-awareness or memory problems. Due to this, trained staff members who interact regularly with this population, such as correctional officers or nursing staff, would be able to record incidents that could be indicative of a TBI in order to recommend progression to the next stage of the TBI screening process.

Following the initial screeners, staff can conduct follow-up interviews with individuals who are likely to have TBIs according to their responses or based upon their interactions with staff. The follow-up interview serves two purposes. First, it helps identify individuals who are malingering in order to receive access to additional services (Appelbaum, 2008). Malingering should be suspected if the incarcerated individual reports lasting negative effects from a mild, uncomplicated TBI as such injuries typically resolve within three months without intervention (Greiffenstein, 2013). Additionally, this step allows staff to identify the extent of the brain injury. Staff likely can begin creating a treatment plan for the incarcerated individual that appropriately addresses deficits that they may possess (Gunter et al., 2009; Vanderhoff, Jeglic, & Donovick, 2011).

Another step that could be utilized to substantiate TBI injuries is to have trained staff seek supplemental information to help validate self-reports completed by incarcerated individuals (Schofield et al., 2011). Unfortunately, there are numerous obstacles to implementation of this step. Obtaining corroborating reports from third parties, such as family members or spouses, is not ideal within the correctional setting, as this may breach confidentiality. The family also may be motivated to help the individual malinger. An alternative is to have waivers signed so that medical staff within the prison can contact hospitals and other medical entities to obtain documentation of any treatment the incarcerated individuals received after they sustained their brain injury. Depending on the severity of the TBI, questions could be raised regarding whether or not the incarcerated individual is capable of providing informed consent to the correctional staff (Vanderhoff et al., 2011). Even when consent is obtained, it may not lead to results if the incarcerated individual cannot accurately recall the year or location of their treatment. Additionally, third party verification can be costly as it requires staff involvement. Thus, supplementary reports of the brain injury are useful, but may not be viable.

In cases where severe deficits exist it may be appropriate to complete a brain scan in order to determine if there is visible damage to the brain (which may be referred to as

a complicated TBI, moderate TBI, or severe TBI). This can be useful since complicated TBIs are accompanied by an increase in difficulties for the individual across a variety of areas such as memory and applied logic. Additionally, those with complicated TBIs recover more slowly than individuals who have less severe brain injuries (Iverson, 2006). It is also possible to identify what specific difficulties the person may experience based upon the location of the injuries. Staff can then use this information to create an individualized treatment plan to help the incarcerated individual work toward recovery within the prison system rather than delaying the healing process until after their release.

Psychoeducation and treatment. As previously stated, a lack of self-awareness among individuals with TBI often means that such individuals are more likely to struggle due to their symptoms (Baldry et al., 2013; Ownsworth et al., 2002). It is important to educate clients on what TBI is; the social, emotional, and cognitive changes that can accompany head injuries; and what they can do to begin overcoming those difficulties. The first step in education is to help incarcerated individuals recognize any coping-related denial that they may possess (Blair & Cipolotti, 2000). Once individuals begin to recognize difficulties that they experience, they then can begin recognizing their limitations. Understanding limitations is vital to TBI treatment since this helps motivate the TBI sufferer to work toward change (Ownsworth et al., 2002).

In addition to helping educate incarcerated individuals about what TBI is, it is also important to identify and treat any mental health issues that they may possess. In many cases they may have dual diagnoses such as depression and substance abuse. Being able to recognize the presence of multiple mental health needs when they exist is invaluable in TBI treatment planning. This is because treating mental health needs concurrently, rather than consecutively, leads to greater gains for the individual (Baldry et al., 2013; Piccolino & Solberg, 2014). Being able to recognize the presence of dual diagnoses is also important since comorbidity of conditions often correlates with slower recovery periods (Iverson, 2006). Including this knowledge in the psychoeducation component of treatment can benefit individuals by giving them a better idea of what they can expect during care while also helping offset future frustration if improvement is not sufficiently rapid.

Psychoeducation is important, but it is most effective when it is paired with other approaches. Some individuals who have sustained a TBI are not interested in engaging in treatment. An effective approach that should be utilized by trained individuals within the criminal justice system to encourage this population is motivational interviewing (MI). This technique helps counselors or other trained individuals encourage their clients to move from the pre-contemplation stage to the action stage of change (Skinner & Cooper, 2013). It has been found to be effective at encouraging individuals with TBI to participate in treatment and has been shown to increase the positive effects that this population experiences from subsequent treatments (Hsieh et al., 2012).

Cognitive behavioral therapy (CBT) is one treatment approach that has been employed successfully with this population and, when it follows MI, it has been found to help reduce negative symptoms such as anxiety (Hsieh et al., 2012). Another reason why CBT

is a useful therapeutic approach within the justice system is that it can be implemented in either an individual or group setting. When properly utilized with individuals who have experienced TBIs, CBT has been found to reduce depression (Williams & Evans, 2003) and anger ratings (Medd & Tate, 2000; Slaughter et al., 2003). While CBT is a promising treatment, it may not be appropriate for individuals with more severe symptoms as a result of their TBIs. This therapy requires that each session build upon work completed in previous sessions, and it utilizes techniques such as Socratic questioning (Fefergrad & Zaretsky, 2013). Memory deficits and an inability to understand abstract language are barriers that should be considered when identifying potential modes of treatment (Korb, 2011).

Other treatment approaches that have shown promise in helping reduce negative symptoms among individuals with TBI include anger management that raises self-awareness and encourages participants to identify personal triggers (Medd & Tate, 2000); psychotherapeutic drugs utilized in tandem with conventional therapies (Slaughter et al., 2003); and teaching the individual to forgive the circumstance(s) or individual(s) that contributed to their head injury (Gisi & D'amato, 2000). Drug treatment also should be considered if the incarcerated individual has a substance abuse problem. If the correctional system begins utilizing these treatment approaches concurrently for individuals with TBI as needed, then it could be possible to help this population successfully reintegrate into society upon their release.

Staff trainings. Another necessary element to begin affecting positive change within the lives of incarcerated individuals is the training of correctional staff about TBI. During this training, staff should be educated about what TBI is and what symptoms incarcerated individuals may exhibit while in custody (Johnson & Enge, 2013; Piccolino & Solberg, 2014). This is a worthwhile investment for two reasons. First, training staff helps them feel more successful while also encouraging greater staff retention (Kelly & Winkler, 2007). Second, it has the potential to improve the lives of incarcerated individuals by leading to more positive interactions with criminal justice staff.

One training that could benefit staff and the individuals they work with is learning how their behavior affects the behaviors of incarcerated individuals. For instance, if there is inconsistency among staff in regard to how to run programs or enforce rules, then it is likely that TBI positive individuals will become triggered to engage in externalizing behaviors. This population requires structure and consistency within their daily lives and schedules (Kelly & Winkler, 2007). When their schedules and regular routines are disrupted, they are more likely to act out. Being aware of this could enable staff to strive for greater uniformity in their own actions. This small change should create a more positive environment for incarcerated individuals who have experienced a TBI. Another concern that staff should be aware of is how overstimulation from noises, lights, and the movement of others can make it difficult for individuals with TBIs to attend to directives or maintain positive behaviors. Staff may be unable to rid the areas they supervise of these distractions, but they can allow incarcerated individuals to retreat to areas such as their cells for a "time out" when needed so that they can return to a more relaxed state (Kelly & Winkler, 2007).

In addition to this, staff should learn de-escalation techniques and how to effectively address negative behaviors with TBI positive inmates (Ferguson et al., 2012).

Staff also should be trained in how to effectively communicate with individuals who have experienced a TBI. Giving verbal directives to this population will not always be sufficient depending upon the severity of the head injury. Correctional staff should be prepared to repeat themselves as it is possible that they will not be heard or understood when they first speak (Johnson & Enge, 2013; Korb, 2011). Staff can attempt to ensure that they are understood by asking this population to repeat what they were told in their own words (Vanderhoff et al., 2011). If the incarcerated individual is unable to do this, then staff should consider that this could be due to a lack of comprehension rather than immediately identifying an absence of cooperation as defiance. It is also important for correctional workers to be aware that they may have to go through this process multiple times due to the cognitive and memory deficits that this population frequently experiences (Schofield et al., 2006b). Staff also are encouraged to be mindful of the tone of voice they use when they interact with this population (Korb, 2011). If staff members begin to raise their voices in what could be construed as a threatening manner, then it is possible for personnel to unwittingly create a situation where the TBI positive individual begins to act out.

CONCLUSION

Traumatic brain injuries often are associated with personality changes, depression, anxiety, substance abuse, and aggression. The presence of these traits and behaviors can then increase the likelihood that an individual will become involved with the legal system. After becoming involved in the justice system, this population faces many difficulties resulting in higher rates of recidivism than their peers. These are real issues, but they are not insurmountable. Appropriately identifying TBI, creating and implementing individualized treatment plans for those with TBI, and training correctional staff has the potential to help this population more successfully reintegrate into society.

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