Emotional Distress Following Traumatic Brain Injury

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Abstract

A traumatic brain injury (TBI) is a significant life event that can have serious and long-lasting impacts on neurobehavioral and psychosocial functioning, and may cause disruptions in major life areas. High levels of emotional distress are frequently experienced by persons who have sustained a TBI, and are associated with poorer functional outcomes following injury. Effective assessment and treatment of emotional distress and the "wounded soul" (J Head Trauma Rehabil 1991, 6(4):1–10) in persons with TBI are well-recognized as important components of rehabilitation following TBI. This chapter will focus on the most common types of emotional distress experienced by persons who have sustained a TBI: depression and anxiety. Factors associated with the experience of emotional distress following injury, assessment considerations, and interventions for emotional distress will be discussed. Finally, two case studies that highlight issues that may impact the psychological treatment of emotional distress in persons with TBI will be presented.

Depression

Depression is the most common mood disorder experienced by persons who have sustained a traumatic brain injury (TBI). A recent systematic review found that the prevalence of depression in persons with TBI, diagnosed with structured clinical interviews, was approximately 30 % across varying time-points post-injury [1]. In a prospective cohort study of patients hospitalized for TBI, 53.1 % of the sample met criteria for a diagnosis of depression at some point during the first year following injury [2]. A recent longitudinal study of persons with TBI who received inpatient rehabilitation found that three-quarters of those who were depressed at 1 year post-injury

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experienced clinically significant depressive symptoms at 2 years post-injury [3]. Reported rates vary widely, likely reflecting differences across study samples and in how depression is assessed (e.g., 11.9–64 % within the first year of injury [2, 4–6]), yet the reported prevalence rates of depression in persons with TBI are often markedly higher than the 7 % rate reported for the general population [7]. These findings underscore the large number of persons affected by depression following TBI.

Persons with depression following TBI experience poorer functional outcomes compared to persons without depression following injury, even after controlling for the severity of injury [5]. Post-TBI depression has been associated with decreased life satisfaction and perceived quality of life [2, 8, 9], disruptions in social and family functioning [10–12], and vocational difficulties [11, 13, 14]. A recent study by Hart et al. [5] described a monotonic dose–response relationship between severity of depression and measures of disability, societal participation, and satisfaction with life. Increasing severity of depression was associated with increasing functional deficits in this sample. Rosenthal, Christensen and Ross [15] described depression in persons with TBI as "a barrier to the achievement of optimal rehabilitation goals in the successful reintegration of the patient into the home, family, community, and work environment."

Factors Associated with Depression Post-TBI

Several factors are associated with an increased risk of depression following injury, including younger age [2, 5], lower levels of education [2, 16], a premorbid history of psychiatric disorder [2, 17], premorbid substance abuse [2, 5, 16], depression at the time of injury [2], and poorer pre-injury social [18] and vocational functioning [16]. Findings regarding sex are mixed, with some studies showing that women are at greater risk for depression following injury [5] while others have found higher rates of depression among men [16].

There is consistent evidence that the severity of the injury, which is often defined according to Glasgow Coma Scale scores or duration of post-traumatic amnesia, is not related to depression following injury [2, 5, 13, 16, 19]. Yet other injury-related factors may contribute to depression following TBI. Major depression following TBI has been associated with reductions in hippocampal [20] and left prefrontal gray matter volumes, especially in ventrolateral and dorsolateral regions [17], as well as hypometabolism of the lateral and dorsal frontal cortex and cingulate gyrus, and increased activation in ventral limbic and paralimbic structures [21]. Disruptions to major neurotransmitter systems, including serotinergic, glutaminergic, cholinergic, and dopaminergic systems, and neuroendocrine abnormalities have also been hypothesized to contribute to depression following TBI [21]. A particular lesion location is not considered necessary or sufficient for the development of depression following TBI [21], but biological factors may play a greater role in early onset compared to late-onset post-TBI depression [18, 22]. The development and experience of depression following TBI is likely influenced by biological, psychological, and social factors [21].

The relationship between depression and functional outcomes is complicated, since depression may contribute to poorer functioning via reduced motivation or compliance with rehabilitation or may reflect the emotional response to changes in functioning and participation following injury. Studies that investigated the temporal relationship between depression and functional status suggest that the experience of functional limitations precedes the development of later depression [23, 24]. Pagulayan et al. [23] examined health-related quality of life and depression at 1, 6, and 12 months post-injury in 135 adolescents and adults with complicated mild to severe TBI, and found that early report of health-related impairments was associated with depression at 1 year post-injury. In contrast, there was no significant relationship between early depression and health-related impairments at 1 year post-injury. Schönberger et al. [24] investigated the temporal relationship between depres-

sion and functional status in 122 adults with mild to severe TBI, and found that poor functional status at 6 months post-injury predicted depression at 12 months post-injury. In a consecutive sample of 96 patients with mild to severe TBI, lack of improvement in perceived functioning following hospital discharge was associated with depression at 3 months post-discharge, controlling for age and depressive symptoms at the time of discharge [25]. In a related study, the persistence of disability and the development of disability following initial recovery were associated with depression and decreased feelings of self-worth in a sample of 334 persons 5–7 years following mild, moderate, or severe TBI [19]. These findings suggest that the experience of functional limitations and disability appears to play an important role in depression following TBI.

Depressive Symptoms

The assessment and diagnosis of depression following TBI can be challenging because some of the symptoms of depression, such as poor concentration, decreased energy, and sleep disturbances, may be attributed to the TBI. Concerns regarding inflated scores on self-report measures and inaccurate diagnosis are understandable given these overlapping symptoms. Yet depressive symptoms experienced by persons with TBI are generally consistent with depressive symptoms reported by the general population [13, 26, 27]. Cook et al. [26] investigated responses to the Patient Health Questionnaire 9 (PHQ-9) in a sample of primary care patients versus a sample of patients with TBI to determine if PHQ-9 scores were inflated among patients with TBI and to examine the validity of PHQ-9 items, especially those that assess transdiagnostic symptoms, to assess depression in persons with TBI. They found that all PHQ-9 items were loaded on a single depression factor in both the primary care and TBI samples. There was no differential item functioning that could be attributed to TBI, and no systematic inflation of scores in persons with TBI. They concluded that these findings fail to support the belief that some symptoms of depres-

sion are not valid indicators of depression among persons with TBI.

However, depressive symptoms may manifest differently among persons with TBI. Seel, Macciocchi, and Kreutzer [28] have described how empirically based symptom manifestations in persons with TBI may present in relation to corresponding DSM-IV criteria for a major depressive episode. For example, the symptom of depressed mood may appear as irritability, frustration, anger, or aggression. Lack of confidence, discomfort around others, and social withdrawal may indicate feelings of worthlessness. Regarding the symptom of diminished thinking ability, self-reported attention and memory problems are often greater than objective findings [28]. Symptoms that have been found to differentiate depressed from non-depressed persons with TBI include rumination, self-criticism, distress, guilt, depressed mood, lack of energy, feelings of worthlessness, and suicidal ideation [27, 29]. Although discussion of aggressive behaviors following TBI is beyond the scope of this chapter, it is important to note that among persons with aggression following TBI, depression is often present [17, 30].

Depression and Cognition

There is some evidence that depression impacts cognition, especially executive functioning, following TBI [17, 31, 32]. Schiehser et al. [32] investigated neuropsychological functioning, depression, and symptom-complaints in a sample of 71 noncombatant military personnel with mild to moderate TBI. They found that depression, but not injury severity, was associated with decreased scores on measures of executive functioning and memory. In a study by Jorge et al. [17], 91 patients with mild, moderate, and severe traumatic brain injury underwent comprehensive psychiatric and neuropsychological evaluations at 3 months post-injury. Patients with and without major depression did not differ on measures of injury severity. However, patients with major depression performed worse on two of three measures of executive functioning when compared to

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patients without major depression; no differences were observed on measures of language and memory. In a sample of 74 patients with mild to moderate TBI approximately 6 months post-injury, patients with major depression performed worse on measures of working memory, processing speed, and verbal memory, and showed greater perseveration on the Wisconsin Card Sorting Task [33]. In contrast, in a separate sample of 100 patients with moderate to severe TBI, there was no relationship between depression and neuropsychological functioning at 6 months post-injury [34]. In a related study, Fann et al. [35] reported improvements in psychomotor speed, cognitive efficiency, verbal memory, and flexible thinking following an 8-week treatment trial of sertraline for depression in a sample of 15 persons with mild TBI.

Anxiety

The literature on anxiety following TBI, though smaller compared to that on post-TBI depression, indicates that anxiety is commonly experienced in persons with TBI [36–41]. The reported rates for anxiety disorders, like those for depression, vary due to methodological and sample differences but are generally higher than the rates reported for the general population [7]. Generalized anxiety disorder (GAD) and post-traumatic stress disorder (PTSD) are the most frequently diagnosed anxiety disorders in persons who have sustained a TBI. Gould et al. [40] investigated the development of psychiatric disorders using a structured clinical interview in a prospective sample of 102 persons with predominantly moderate to severe TBI, and found that 44 % met criteria for an anxiety disorder during the first 12 months following injury. The most common anxiety disorders diagnosed were anxiety disorder not otherwise specified (35 %) and PTSD (12.7 %). Whelan-Goodinson used a computerized structured clinical interview to study psychiatric disorders in a sample of 100 persons with medically documented mild to severe TBI who were between 6 months and 5½ years post-injury and found that 38 % experienced at least one anxiety disorder [42]. The most common disorders were GAD (17 %) and PTSD [14 %]. Ashman et al. [36] investigated rates of Axis I disorders in 188 persons with self-identified TBI between 3 months and 4 years post-injury. The rate of PTSD was 38 % among those at 1 year post-injury, 18 % for those at 2 years post-injury, and 33–34 % among those 3–4 years post-injury. The combined rate of other anxiety disorders was 30 % among those at 1 year post-injury, 27 % for those at 2 years post-injury, 21 % at 3 years post-injury, and 26 % at 4 years post-injury. Anxiety, like depression, is also associated with poorer functional outcomes, including occupational activities and interpersonal relationships [43].

There is a high level of comorbidity between mood and anxiety disorders in persons who have sustained a TBI. Prevalence rates for the presence of a comorbid anxiety disorder among persons with depression following TBI range from 41 to 76.7 % [2, 17, 44]. Anxiety is more common in depressed persons with TBI than in nondepressed persons with TBI [2]. The most consistent factor associated with anxiety following TBI is the pre-injury history of anxiety disorder [36, 40, 45]. However, some studies have also reported that older age [45], unemployment [45], and being female [36] were associated with anxiety following TBI. The current evidence suggests that injury severity is not associated with anxiety following injury [40, 45], which is consistent with the findings regarding depression and injury severity. Memory for the traumatic event has been associated with the development of PTSD in a prospective study of 120 persons with mild TBI [46]. Fourteen percent of the overall sample met criteria for PTSD at 6 months post-injury, and persons with memory of the traumatic event were at higher risk for developing PTSD compared to persons with no memory for the event. Memory of the traumatic event, acute post-traumatic symptoms, acute symptoms of depression and anxiety, and history of psychiatric disorder were associated with increased risk of PTSD at 6 months post-injury in this sample.

Much of the recent literature on PTSD and TBI has focused on mild TBI in military samples. The relationship between PTSD and mild TBI is

complicated due to the overlap of symptoms and their association with postconcussive symptoms. A discussion of postconcussion syndrome is beyond the scope of this chapter. Yet it is important to note that reports of postconcussion symptoms and post-traumatic stress are highly interrelated in military samples. For example, Hoge et al. [47] reported that soldiers with injury-related loss of consciousness (LOC) had higher rates of physical and post-concussive symptoms compared to soldiers with other injuries as a result of injury; however, these relationships, with the exception of headache, were not significant after adjusting for PTSD and depression. Other studies using military samples have also found that postconcussive symptom reporting following mild TBI is related to PTSD [48].

Suicide

A number of population-based and clinical studies have documented an increased risk of death from suicide among persons who have sustained a TBI [49–51]. Persons with TBI are at three to four times higher risk for committing suicide compared to the general population [52]. Elevated rates of suicide attempts [53] and suicidal ideation [54] have also been reported among persons with TBI. Persons who sustain a TBI as a result of a suicide attempt had more pre-injury psychiatric and psychosocial problems, including substance abuse, previous suicide attempt, and previous psychiatric hospitalization compared to persons with unintentional injuries [55].

Increased risk of suicide in persons with TBI has been associated with several factors including concurrent psychiatric disorders, substance abuse, and self-inflicted mechanism of injury [49]. Persons with ICD codes indicative of more severe injuries (cerebral contusion, intracerebral hemorrhage) showed an increased risk of suicide compared to persons with ICD codes suggestive of less severe injuries (concussion, cranial fractures) [49]. The findings regarding sex are mixed, with some studies reporting no sex differences with respect to suicide attempt or suicidal ideation [52, 54], while others have reported an increased risk of death by

suicide among females [49]. Persons with TBI with a post-injury history of emotional or psychiatric disorders, substance dependence, or both are more likely to attempt suicide compared to those with no significant psychiatric or substance abuse history [56]. Some neurobehavioral consequences of TBI, such as aggression, depression, and impulsivity, and concomitant disturbances in family and occupational functioning, are also general suicide risk factors and may contribute to increased risk following injury [57].

Tsaousides et al. [54] investigated suicidal ideation (SI), defined as thoughts of dying or suicide with or without plan, in a sample of 356 adults who had experienced TBI. Approximately 28 % of this sample endorsed SI at least once during a 5-year follow-up period. SI was associated with pre-injury substance abuse, post-injury anxiety disorders, and concurrent depressive and anxiety disorders, but was not related to demographic characteristics, injury severity, time post-injury, or pre-injury psychiatric history. SI was also associated with lower perceptions of well-being, quality of life, and perceived social support. The latter is consistent with research with veterans that suggests that social support may serve as a protective buffer against SI [58].

Attention to warning signs as well as knowledge of risk factors is important in the assessment of suicide risk in persons with TBI. Simpson and Tate [56, 59] conducted interviews with 43 persons with TBI who had attempted suicide to identify antecedent circumstances to the attempt. Results of these interviews revealed that warning signs and circumstances that preceded the attempt included feelings of depression and hopelessness (e.g., "sick of being the way that I was"; "wish my life had ended at the accident"), relationship conflicts and breakdowns ("my wife decided to separate and took the children"), instrumental difficulties, social isolation, an intolerable accumulation of stress, and nonspecific references regarding perception of injury (e.g., "nothing can be done to treat the brain injury"). They also found that 48.3 % of those who made an attempt post-injury made at least one other suicide attempt, and that repeated events were often done over a circumscribed

time period. Simpson and Tate [56] argue that persons with TBI who have attempted suicide should be closely monitored for at least 1 year following their first attempt.

There is no evidence for a critical post-injury time period for increased risk of suicide [54, 60]. Rather, this risk appears to persist over time [54, 60]. Given the persistence of elevated risk, Wasserman et al. [61] propose that clinicians utilize a low threshold for screening for suicide among persons with TBI, especially for those with mood disorders and substance abuse, and include inquiries regarding suicidal ideation, behavior, and intent in clinical interviews [28].

There is no significant evidence regarding the validity of screening instruments specifically for suicide in persons with TBI, or for the effectiveness of specific treatments for suicidality in persons with TBI. Therefore, adherence to current general practice guidelines is recommended [57, 60]. Simpson and Tate [60] have described how the Institute of Medicine's three-tiered model of suicide prevention strategies (universal, selected, indicated) can be applied to the TBI population. These prevention strategies are presented in Table 1.

Assessment Considerations

The structured clinical interview remains the gold standard for diagnosing depressive and anxiety disorders in persons with TBI. However, self-report measures are often used to screen for emotional distress and to monitor symptoms over time. Self-report measures are frequently used clinically and in empirical investigations of emotional distress. There are several measures with demonstrated validity as screening measures for depression and anxiety following TBI [28, 62]. These measures include: the Beck Depression Inventory-II [63], the Center for Epidemiological Studies-Depression Scale [64], the Patient Health Questionnaire-9 [65], Neurobehavioral Functioning Inventory-Depression Scale [66], the Depression Anxiety Stress Scales [67, 68], and the Hospital Anxiety and Depression Scale [69].

Self-report measures are best used for ruling out the presence of an emotional disorder [28].

Table 1 Suicide prevention in persons with TBI

Level of intervention	Clinical management
Universal	• Promote positive mental health
• All persons with TBI	• Assess hopelessness and SI proactively
	• Recognize that persons may be at risk at various times post-injury
	• Promote long-term supports
	• Monitor males and females equally
Selected	• Provide treatment for emotional disorders and substance abuse
• Persons with TBI at risk for suicide	• Monitor persons with comorbid conditions and persons who sustained TBI as result of suicide attempt
Indicated	• Reduce lethality of environment
• Persons with TBI for whom suicide is an identified issue	• Provide treatment for emotional disorders and substance abuse
	• For persons with past suicide attempt, be aware that persons may use more than one method
	• Conduct full clinical interview, including structured risk assessment
	• Monitor for at least 12 months following a suicide attempt
	• Provide emergency contact card with crisis numbers

Adapted from Simpson and Tate

Cook et al. [26] suggest that clinicians utilize an "inclusive" approach to the diagnosis of depression following TBI, where all symptoms are counted toward the diagnosis regardless of possible cause (e.g., TBI or depression), and that clinicians not minimize reported cognitive or somatic symptoms when diagnosing depression in this population. Clinicians should use structured clinical interviews following a positive screen to confirm a suspected diagnosis in persons with TBI. The structured clinical interview is also indicated for the differential diagnosis of patients with TBI who present with complex symptoms and with symptoms that can be attributed to multiple disorders [28]. In cases where clinicians

have concerns regarding the impact of impaired awareness on the validity of a patient's responses, use of specific and concrete questions during the clinical interview is recommended [28].

Interventions

Patients with depression and/or anxiety may receive pharmacological and/or psychological treatment for their emotional distress. Unfortunately, the literature suggests that there are large numbers of persons with clinically significant depression and anxiety who are not receiving treatment [2, 42]. There is insufficient evidence regarding the efficacy of a specific class of medications for the treatment of depression or anxiety following TBI [70, 71]. There is not sufficient evidence to support practice recommendations regarding specific psychological treatments for depression or anxiety [70, 71] of persons with TBI. However, there is a growing body of literature investigating the use of psychological interventions validated in the general population, especially cognitive-behavioral therapy, to treat emotional distress in persons with TBI.

Cognitive-behavioral approaches to the treatment of emotional distress have demonstrated effectiveness in many populations, and appear ideally suited for the TBI population because they offer inherent structure and focus. This structure and content can be adapted for use with persons with cognitive deficits [72]. In fact, the majority of psychological interventions for emotional distress following TBI described in the extant literature are cognitive-behavioral interventions that have been modified for use with persons with cognitive deficits following injury [73–76] or include cognitive-behavioral components [77]. Results of these studies suggest that the use of adapted cognitive and behavioral interventions may improve emotional functioning following TBI. However, there are several limitations to these findings including small sample sizes, lack of control group, mixed etiology of injury, and use of convenience samples that may not be experiencing significant levels of emotional distress. Some studies excluded persons with more

Table 2 Adaptations to cognitive-behavioral interventions

• Provision of supplementary written materials	• Built-in repetition and review of key concepts
• Focus on concrete goals	• Providing "extra time" for sessions
• Provision of session summary notes	• Providing within-session breaks
• Limiting the amount of text on worksheets	• Use of larger font size
• Limiting size of group	• Using visual aids and checklists
• Providing multiple choice options on worksheets	• Reducing emphasis on self-directed, higher level reasoning skills

severe cognitive deficits, resulting in improved internal validity, but limited generalizability of findings and prevention of further examination of the impact of cognitive deficits on response to the intervention.

Persons who sustain a TBI, especially a moderate or severe TBI, often experience cognitive deficits that could have a negative impact on their ability to benefit from standard psychological treatments. For example, poor attention and memory could impact learning and recall of session content. Decreased initiation could impact perceived compliance with treatment. Problem-solving deficits could impact completion of homework assignments. Thus, psychological interventions for the treatment of depression and anxiety following TBI should take such deficits into account and be adapted to fit the needs of the individual client. Incorporating cognitive rehabilitation techniques into psychotherapeutic interventions may be important for maximizing response to psychological treatments for emotional distress following brain injury [78].

Reported adaptations to the structure and content of cognitive-behavioral interventions are listed in Table 2. These and other adaptations have also been applied in a recent pilot study of a mindfulness-based stress reduction program for reducing depression in persons with mild TBI and post-concussion syndrome [79]. Findings to date suggest that persons with cognitive deficits can participate in and benefit from these adapted interventions [73, 74, 76].

It is also important to note that psychological treatment of emotional distress is a key component of comprehensive cognitive rehabilitation programs, and there is evidence that participation in these programs is associated with improved outcomes, including community integration, life satisfaction, emotional functioning, and self-efficacy [80, 81]. However, the impact of program components that are specific to the treatment of emotional distress is unknown at this time.

The importance of developing and maintaining a meaningful life following TBI is often an important part of psychotherapy following TBI [82]. Ruff [83] describes some of the unique issues faced by psychotherapy clients with TBI due to the nature of their injury-related deficits and their effects on multiple life areas, including social relationships, vocational functioning, and financial status. Ruff suggests specific topic areas to explore when helping clients to re-establish meaning following TBI. These include identifying expectations for the anticipated future prior to injury, understanding how the TBI has altered the client's life and introduced functional limitations, grieving the loss of the anticipated future, and developing a realistic and meaningful future that involves living in accordance with one's core values. Given the relationship of functional limitations to depression, addressing functional limitations may be of considerable importance for improving and maintaining emotional well-being. Pagulayan et al. [23] suggest that addressing functional limitations may be an important part of treatment for depression in persons with TBI. Finally, consideration of individual preferences regarding treatment types is also important since comfort with and acceptance of treatment type may impact participation and adherence. Fann et al. [84] conducted a telephone survey of 145 persons with mild to severe TBI to explore preference regarding different treatments for depression. Physical exercise and counseling were preferred over other types of treatment including antidepressants, self-help materials, and group therapy or support groups.

There is a strong need for more research in psychotherapeutic interventions for emotional distress following TBI. Specifically, future studies should include larger samples, utilize measures validated for the diagnosis of emotional distress in the TBI population, include an appropriate control condition as well as measures of treatment fidelity, and include long-term follow-up assessments. Investigation of cognitive and psychosocial factors that may impact response to treatment is also warranted so that patients may be "matched" with the treatment most appropriate for them. Examination of interventions validated in other populations, such as behavioral activation approaches, may also be beneficial. Development and evaluation of interventions that target the needs of persons with dual substance abuse and mood disorder diagnoses following TBI is important given the unique needs of this population. Finally, efforts aimed at preventing depressive and anxiety disorders and maintaining emotional well-being over time can have significant and positive impacts on persons with TBI.

Case Studies

The following case studies present different psychological approaches to treating emotional distress in persons who have experienced a TBI, and discuss factors that can inform treatment planning. Case 1 is an example of the treatment of emotional distress in a traditional outpatient setting. Case 2 is an example of the treatment of emotional distress within an interdisciplinary rehabilitation setting, and illustrates how other behavioral interventions can have an impact on emotional functioning following TBI. These examples also highlight how cognitive rehabilitation techniques can be incorporated into psychological interventions for emotional distress.

Case 1

A 39-year-old woman who experienced a moderate TBI at the age of 22 presented for neuropsychological evaluation with complaints of attention problems and anxiety. There was no other significant medical history. The patient graduated from high school and was employed

full-time in a call center. She was the single mother of an 11-year-old boy. During the clinical interview, the patient described feeling overwhelmed at work following a recent promotion and uncertain of her ability to handle new job responsibilities. Her son is enrolled in gifted classes at his middle school, and she stated she was "not smart enough since my injury" to help her son with his increasingly difficult homework or to communicate with his teachers. She reported feeling "sick to my stomach" at a recent back-to-school night as the teachers reviewed upcoming student projects. Neuropsychological evaluation revealed mild impairments in information processing speed and variable performance on measures of attention, verbal learning, and memory. Performance on other cognitive measures was within normal limits. Responses to self-report measures of emotional functioning revealed moderate to severe anxiety and mild depressive symptoms. The patient was referred for psychological treatment for anxiety and depression.

The results of the neuropsychological evaluation suggested that this patient would be a good candidate for a psychological intervention that included components of CBT, and her treatment plan was developed in accordance with this model. The patient expressed good understanding of this therapeutic approach and was able to identify thoughts with minimal prompting. She was an active and engaged participant during treatment sessions; however, she demonstrated very poor completion of assigned homework. Discussion of this homework issue revealed that the patient misplaced her homework on some occasions and, at other times, did not remember it until she was on the way to her appointment. Thus, this failure to complete the homework reflected a memory problem rather than noncompliance with the treatment plan. The therapist applied a structured problem-solving approach to the discussion of potential compensatory strategies she could use to help remember her homework, including the use of a memory station, memory notebook, smartphone, and checklists. The patient expressed a strong preference for use of her smartphone applications to help remember homework, and to have electronic versions of the homework that she could access easily. The patient, in collaboration with the therapist, developed a compensatory strategy centered around her smartphone to help her remember her homework. This strategy became quite successful following some initial refinement of the components. The patient's role in developing this strategy and successfully managing this memory problem was also used as evidence to counter her belief that she was "not smart enough" since her injury.

Case 2

A 19-year-old male who experienced a severe TBI at the age of 7 was referred to a post-acute brain injury rehabilitation program for vocational services. Neuropsychological evaluation showed impairments in multiple domains including attention, learning, memory, executive functions, and processing speed, as well as clinically significant depressive symptoms. Clinical interview revealed that the patient had some acquaintances, but no close friends; he socialized exclusively with family. Notable social communication deficits were observed including poor eye contact, the telling of moderately offensive jokes, frequent interruptions characterized by off-topic comments. The examiner noted that the client frequently acted younger than his age. His stated goals were to get a job, to obtain his driver's license, and to have a girlfriend.

In contrast to Case 1, the results of the neuropsychological evaluation described in Case 2 documented several cognitive impairments that would likely impact his ability to benefit from a CBT-based approach, especially impairments in executive functions. Thus, a more behavioral approach to the treatment of his depressive symptoms appeared warranted. The client expressed understanding of, and agreement with, his treatment plan. Further assessment revealed that the client enjoyed outdoor activities such as playing sports and walking with his dog. The client and therapist developed a schedule of regular meaningful activities and investigated community-based recreational sports programs which led to his registration in a local judo class. Initially, he had some difficulty following his activity schedule. He

reported that he could not remember what he was supposed to do first. Family also reported that he would confuse the order of the steps or get distracted by another activity and fail to return to the task. The therapist helped the client to develop checklists that contributed to improved completion of the tasks. Also, family decided to start paying client for completing household chores, including simple yard work and laundry, to reward successful task completion. Participation in meaningful activities and task completion improved. This was associated with improvements in depressive symptoms. The patient also participated in a social skills intervention group to address his social communication problems. Strengthening social skills can contribute to improved relationships with others, and thus increase perceived social support, which also plays an important role in the experience of emotional distress.

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